

Study on the Ecosystem of the Kachi Plain with  
Focus on Spate Irrigated Areas of Bhag Narri,  
Balochistan - Pakistan

34



Practical Note



Flood-Based Livelihoods  
Network Pakistan



Flood-Based Livelihoods  
Network Foundation



## 1. Introduction

Ecology is a broad term which defines the biodiversity as a whole through exploring the interactions of the biotic and abiotic elements. This report does not cover all aspects of the ecosystem but mainly focuses on the biotic life. Bhag Narri is located in the Kachi plain part of Bolan/Lehri District of Balochistan Province in Pakistan. The same Ecology prevails throughout the Kachi Plains. The Kachi Plains had been entirely part of district Kachi until 1970. Later on, 3 new districts (Bolan, Jhal Magsi and Lehri) have been created from 1991-2013 and divided the plain boundaries under these districts. Day temperatures rise to 45-50 degrees centigrade 15 May to 30 June every year. Hot summer winds drying up all earthen ponds confining the life to household boundary. Day time mobility is reduced to zero after 10am to 5pm, human and animal gets weaker to fight the temperatures and sunstroke (locally called jhola) is common in those days. People carry onions with them to smell it and take moisture to keep the nostril wet and breath. Public transport prefers to run in the mornings or evenings. The terrain is plain and dry, large numbers of the villages are connected with each other through dirt track. Water is scarce with comparison to the land availability. All the crops grown in the area are organic and no fertilizers and chemicals are used. 80% of the local population lives in adobe houses. The local population belongs to different ethnic groups but they have cohesion among them and live peacefully together. Locals are multilingual and can understand and speak several languages. The inhabitants of the Kachi Plain follow their own Bikrmi calendar for making calculation of the weather, winds, and crops sowing season, and its impacts on the human health which is given on the right.

### **Health related local wisdom in line with months and season:**

*Chet & Visakh = to walk to enjoy the fresh air impacts.*

*Jeth & Harh = sleep extra (probably at day time to avoid sun).*

*Sawan & Bhadon = Take frequent bath.*

*Aso & Katein = eat less and you don't need to visit doctor (probably to avoid food poisoning) foods gets contaminated quickly in these months.*

*Maghar & Poh = lit the fire and seek warmth.*

*Phagan = Sit easy against the walls to seek the sun light.*

Table 1: List and Names of the Months in Bikarmi with Comparative of Georgian Calendar

| Broad Seasons | Name of Bikirmii Months | Georgian Calendar from to     | Number of days in month |
|---------------|-------------------------|-------------------------------|-------------------------|
| Summer        | Visakh                  | 14th April - 14th May         | 31                      |
|               | Jeth                    | 15th May - 15th June          | 32 some say 31          |
|               | Harh                    | 16th June - 16th July         | 31                      |
|               | Sawan                   | 17th July - 16th August       | 31                      |
|               | Bhadon                  | 17th August - 16th September  | 31 some say 30          |
|               | Asu                     | 17th September - 17th October | 31 some say 30          |
| Winter        | Katien or Katak         | 18th October - 15th November  | 29 some say 30          |
|               | Maghar                  | 16th November - 15th December | 30                      |
|               | Pooh                    | 16th December - 13th January  | 29 some say 30          |
|               | Magh or Maah            | 14th January - 11th February  | 29 some say 30          |
|               | Phagan                  | 12th February - 13th March    | 30                      |
|               | Chet                    | 14th March - 13th April       | 31                      |

Note: this calendar is in use in /Pakistani/(Indian) Punjab that has tropical and semi tropical weather. All sayings and proverbs, sowing and harvesting seasons co-relates to the tropical zones of Indo/Pak. It may not be co relevant to other ecological zones or temperate zone on in highlands ecology.

**2. Geographical Background**

The Kachi plain is arid, dry and a hot temperate zone in south eastern Balochistan. Surface water availability is none existent throughout the year and seasonal spates or rains are the major source of water in the Plain. Western Kirther range has some springs and small perennial water flow in Sukleji, Kashuk, Khari, Mula and Bolan rivers which are utilized by the nearby communities. The approximate length of entire plain is 1000<sup>2</sup> km. There are two types of settlement; sedentary and nomadic. In the summer months 5% of the population migrates to the highlands of Quetta, Mastung, and Splingi area with their families to avoid the scorching heat while poor stays in their villages.

The plain starts from Sibi in the North, Kirther Range in its west, in the south it ends at Dera Murad Jamali and in the east district Lehri. Major settlements in the Kachi Plain are Bhag, Lehri, Bakhtiar Abad, Nautal, Mithri and hundreds of small villages and hamlets settled along the Spate Rivers.

This study covers only one a small part of Kachi plain called Bhag Narri in district Bolan Balochistan. It is situated at Longitude: NE 29°, 10.28-30 and Latitude: SE 68°, 04.27.15. The map below shows the area of district Bolan only, the lower parts

after Sibi comes in Kachi plain.

-> In the East: Sub Tahsil Chattar, Tahsil Lehri District Kachi

->In the West: Sub Tahsil Mirpur, Boundaries of district Kalat and Khuzadar

->In the South: District and Town Gandawa, Sub Tahsil Mirpur, Sub Tahsil Tambo, Sub Tahsil Chatter. District Kachi (now Dera Murad Jamali).

-> In the North: Sab Tahsil Bala Narri, Tahsil Dhadar, and (Suni Area).

In 1970, Tehsil Bhag - consisted of two types of areas (i) Hilly and (ii) Plain area. The mountain area in Bhag tehsil is nominal that dissects its boundary from Kalat and Khuzdar districts in the west. There is no irrigable land in the mountain area, albeit the hillside streams and dry rivers emanating from the mountains irrigate the lands in Shouran-sub tehsil of district Bolan.

The lands in Kachi Plain area are mostly irrigable dry arid wastes but lands in Bhag tehsil are fellow lands (irrigated with flood water only). The Height of Bhag town is 369ft above sea level and the summer is extremely dry and hot.

November through March, the weather remains moderate. However there blows a local north wind called Utar or Kumbi. This wind blows in winter



Figure 1: Geographical area of Bolan district

and is extremely cold. Sometimes there blows a north -east wind called Bakkar Wal brings rain, west wind called -Jholo and eastern wind called -ubharda-. In summer the southern wind also blows which is called Lukh or Jhola<sup>1</sup>. The southern winds are exceptionally hot. The hot season lasts for 6 months (from April to September). Lukh or Jhola winds blow from mid-May till the end of June. Dry and hot winds always scorch the green cover on top of soil and trees shed the leaf. Dust Storms are common in summer months.

Bhag Town is one of the major human settlements in the Bolan district. The town's population consists of Hindus and Muslims that live in cohesion and peace. The major languages of the area are Saraiki, Sindhi and Balochi and a sizeable part of the local segment speaks a Bloachi dialect of Brahvi. The majority of the local inhabitants is multilingual and can speak all languages.

The area has the history of earthquake as well; such earthquake happened in 1868, 1913, 1928 and 1930 and damaged many houses<sup>2</sup>.

Water is not available in the Kachi plains including (Bhag) Narri area. The major source for irrigation and drinking water are seasonal floods, which occur in the monsoon season July-August. The major rivers that enter the area are Narri, Lehri, Mach and Talli.

Narri River is the main source of water for the Bhag (Narri) area. The river enters into the plains near Sibi. The perennial flow in this river is used by the farmers, the local government and Sibi City for irrigation and drinking purposes. The spate flows in Narri Ephemeral River is first used to irrigate the Mithri area and then enters into the Bhag tahsil area where it is used for irrigation and drinking water. Bolan, Kashusk, Mula, and Sukleji rivers entering into the Kachi plain from the west and do not irrigate any land in Bhag Balochistan. However, their water is utilized for irrigation and drinking in Gajan, Suni, Shoran, tehsil Gandawa, and tehsil Mirpur. All the rivers passing Kachi plain finally ends up in Manchar Lake in Dadu District of Sindh Province.

### 3. Socio-Economic profile and demography

Dry land farming is the main livelihood in the area. Approximately, 70 percent of the rural households have unequal land in size which is irrigated by the seasonal floods in Narri River. The water is diverted from the river into the main canals for irrigation in the months of May through-August every year. Winter floods are infrequent in the area with comparison to the summer floods. Agriculture and pastoralism are the largest sources of income of the local population. The third largest source of income is employment provided by the government at local level e.g. jobs in local levies force, police, education, and health department. Bhag is the largest town in the area with a population of 5000 people. Approximately 300 households of Hindu live in the village. Hindu households make their livelihoods from the local trades and they lend cash and daily use domestic edibles on seasonal credits to the local farmers. The rich farmers having large size land ownership also borrow cash from the Hindu on day to day basis to meet their daily life needs and agricultural inputs. At the end of the year, when their crops get ready, these loans are re-adjusted and new borrowing starts. Small and economically poor households are avoided by Hindu traders for such loans knowing the fact that they will not return in timely manner or their land resource is not enough to produce equaling to the borrowed amounts.

All harvested crops are sold at the local market in Bhag town where Hindu traders buy the agricultural produce. The local traders further sell in large quantities of sorghum, mong, mooth, jhamba at the bigger market in Jacobabad, Hyderabad and Karachi in Sindh Province.

Some farmers sell green fodder (mainly sorghum) to the dairy farm owners in Quetta provincial capital of Balochistan and Jacobabad in Sindh, especially in winter months. In other case, outside traders come to the area and buy the standing sorghum, cut it and send it in mini trucks to sell it in different city's markets. Trading and sale of grains and other merchandize continue from the entire Kachi, including Sibi, Dhahdar, Rind Ali, Mithri and Bhag and Shoran towns predominantly on credits.

Sibi city and its surrounding and Rindli village have regular perennial irrigation water supplies from Narri and Bolan Rivers respectively and being closer to paved road facility, the fodder sale in these villages is comparatively better than the sale in Bhag and further deep inside the Kachi Plains. As whole, the sale of the green fodder is done at small scale in a normal year. In dry years when few floods occur, the reduced irrigation increases the

<sup>1</sup> Local Farmers interview and Govt, Field Assessment Report 1970

<sup>2</sup> Balochistan Districts Gazetteer series Chagi - Bolan District 1907 (<https://archive.org/details/in.ernet.dli.2015.279669>)

sale of fodder locally.

The small or landless farmers customarily breed animals to generate their additional incomes. The Bhag Narri cow is a famous breed in the area that caters to the daily needs of milk and dairy produce for the household's consumption. The mature animals are sold in Sibi mela (annual fair) that is held annually in March every year and farmers not only from Bhag but from all over the Kachi area travel to the mela with their animals and stay for nights to sell and buy cattle.

#### 4. Land and Water Rights

##### Land rights

The area has been in the destiny of different rulers in history. By the end of 18th century when Moghul rule became weaker, the Kalhora (Jamoot) took over the power. Later, Khan of Kalat Forces confronted with Kalhora rules and occupied the lands in Sunni area of Shuran and Dhadhar. In this war Khan was killed by the Kalhora Forces. In 1735, Nadir Shah Afghan has conquered Dehli and brought Sindh under his direct control, but Noor Mohammad Kalhora became rebellion to Nadir Shah. Noor Mohammad Kalhora was later arrested by the Afghan Forces and produced in the court of Nadir Shah who released him safely but handed the lands of Kachi to the successor Khan of Kalat as compensation against the blood of previous Khan and his Army. In 1740 Khaan of Kalat state has divided and distributed land among the different Bloch tribes mainly Mengal, Dera Jati (Baloch), Kalandarani, Lasi, Makrani, Samalani, Kharani, Mirwani, Rodeni, Sanjarani, Kambrani, Dehwar, Marri, ELtazai, Bugti, Gurgnari, Jamali, Jamoot, Raisani, Kurd, Lahri, Shahwani, Mohammad Shahi, Lango, Bangulzai, Sarpra and Rind tribes as reward of their services to the Kalat state<sup>3</sup>. Khan of Kalat levied Malia (revenue tax) on all the farmers in the area. The land distribution mechanism among the tribes was adopted on the basis of numbers of soldier provided by different tribes who served in the state military or have been providing soldiers to the state on regular basis. Later, the tribes have further re-distributed land to their tribe's men who serve the Kalat State. State government, existed till 1947, and then annexed to the newly liberated state of Pakistan. There has been transaction, sale and resale of the lands till today among the different tribes hence the equality does not prevail to the current land holding in the light of allocation history. The heads of the each tribe while distributing lands to their tribe's men have kept a major portion for themselves. Hence chief of the Raisani, Rind, Bangulzai, Lehri, Lashari

and Magsi tribes own large lands compared to anyone else in their tribe.

This is the reason diverse Baloch tribes occupy most of the lands in Kachi plains and still live in the area. The old land records of state times are still kept with the local Government at Bhag/Bolan Blochistan. The State was responsible to make changes in the ownership of lands through written orders. List of the villages, hamlets and town settled along the Narri River and draw benefits from the 5 mini barrages is attached as Annex "A" of this report.

Saddat or Syed tribe being the decedents of Prophet Mohammad PBUH were not recruited to the state services being sacred people, and their rule was to provide arbitration among the various tribes upon conflict and feuds. Syed now lives in Gandawa and its surrounding. Few Syed families also live in Bhag area. The shrine of Syed Pir Tiar Ghazi and several others can be seen in the area. All Syed households own the land in the Kachi Plains and live among the local people in different villages.

The first ever land records were prepared in 1962 after inclusion of the Kalat state in Pakistan. There are 141 mouza (land units) registered in Tehsil Bhag in 4 circles (i) Kot Ghual Ali (ii) Bhag Saddar (iii) Pir Tiar Ghazi and Chalgrri and (iv) Mahram Landhi with the following detail of land size: (Parts of Kachi plains coming in district Jhal Magsi, Tehsil Shoran in Bolan, other side Mithri area, entire Tahsil/district Lahri are not part of this report. This report only covers the lands and its detail in 5 Mini Barrages/dispersal structures in Bhag Tahsil in district Bolan/Lehri Balochistan. The entire soil in area has high agricultural potential. With regard to soil climate, the temperature regime is "hyper thermic" and moisture regime is "ariditic" in major soil area<sup>4</sup>. The below figures calculate the total land size in Tehsil Bhag as per government records updated in 1970.

|               |  |
|---------------|--|
| Total land:   | 3, 59923 Acers (in Bhag Tehsil) <sup>5</sup> |
| Cultivated:   | 2, 91,741 Acers (In Bhag Tehsil)             |
| Uncultivated: | 68,182 acres (In Bhag Tehsil)                |

<sup>3</sup> History of Balochistan by Shah Dr.Muhammad Marri

<sup>4</sup> (Ref, Revised PC 1 Six dispersal structures on Narri River, Irrigation department government of Balochistan)

<sup>5</sup> Revenue assessment report 1970, government of Balochistan

Literature, books and farmer interviews show that 30<sup>6</sup> percent of local population in Bhag Tehsil is landless living in different villages and work as labor and tenant. The majority belongs to non-Baloch tribes. Local interviews revealed that either they have sold their lands in the past or they are immigrants from other areas who are now permanently settled in the area. Landless households living in Bhag town make their livelihoods from daily wage labor. Tenancy is also common and arrangements are fair among the tenant and land lord. Tenants are entitled to the 50% percent of the total in both grain and fodder of all crops. Tillage and harvesting is the responsibility of the tenants where seeds are arranged equally. Some of these tenants have their lands but they are not entitled to the irrigation water. There is a need to pursue the influential landlords and tribal heads to allow surplus water to economically poor households who have small land holding. This will contribute to bringing more land under cultivation and to improve the livelihoods of downtrodden segment of the area leading to improve their quality of life and poverty alleviation.

The landless farmers living in surrounding villages are mainly involved in agricultural activities, rearing animals and selling dairy products made at home level. Approximately 500 households make their livelihoods from the agriculture working as tenants. These tenants still own bullocks for draught power since hiring tractor cost them expensive and another hands the bullocks can be sold at the time of emergency. Fodder for the animal is not a problem; being a tenant they own the half of the crop, harvest and crop remains. Majority of tenants are appointed at will but there are also lathbund buzgar in Bhag area. As per mutual agreements tenants at will can be ejected by the landowner, where Lathbund tenants are protected bylaw and cannot be ejected by the landowner. Their living places are provided free of cost by those villages where their landlords live.

### Water rights

At different off takes, different tribes are entitled to water rights along Narri River. Land entitled to water rights is known in size of acreages on the both side of the River. For example, Mithri weir (not part of 5 barrages) is situated on upstream in the sequence of the spate water diversion and is owned by the Nawab Raisani family and his tribe, next comes Erri mainly owned by the Shahwani tribe, Haji Shahr owned by the Shahwani and Basngulzai and Tuk owned by the Lehri, Bangulzai and Raisani, Ghazi is owned by the Bangulzai exclusively, where Khokhar is owned by the Jamoot, Bangulzai, Bugti and Chalgrri tribes.

The land entitled for irrigation water from 5 barrages/dispersal structure is 60,600 acres in size with comparison to the available land which is 91,000 acres as per cadastral records. The culturable waste land on the east-western edges of each irrigation system is huge in size (may be millions of acres large) which is not entitled to water rights traditionally from the Narri River. Only the ghami lands are entitled to the water rights and beghami are not entitled. Ghami means those lands which are occupied by the different tribes or tribe men who served for the state of Kalat by providing soldiers in both peace and war time. None of the Baloch tribe is the original inhabitants of the area and settled after having lands allocation by the Kalat State. Abra called Jamoot tribe are native.



Figure 2: One of the water channels from Mini Barrage at Bhang

### 5. Water Availability

The Kachi plain is dry and sub-tropical and the main source of water for irrigation, human and animal use is the seasonal spate water. The seasonal spate water is stored for drinking in the manmade earthen reservoirs in all villages looking to the size of population. The reservoirs are filled in the monsoon season and subsequent winter floods. In both cases, these earthen reservoirs dry up by the end of April every year if rains disappear. The filling of the drinking water pond remains first priority upon occurrence of floods. Bhag town is large populated village and its reservoirs are filled with first priority. There are two major reservoirs which are filled to cater the needs of town. There are more than 120 small-larger earthen reservoirs in different villages situated around the

<sup>6</sup> Farmers interviews and transit walk and literature review

5 mini barrages. Further upstream or downstream reservoirs are not counted for this report.

No pumping machines are installed at the reservoirs and water is fetched manually through plastic tins, and Jeri canes. All household are allowed to take the water from reservoirs on daily basis without any restriction. There is no house connection at home level. At Bhag town, the drinking water is fetched by the donkey drivers in a 200 liters barrel mounted on the 2 wheel donkey pushed carts. The current price of the donkey trip is Pak Rs: 60 or 0.6USD. Each household places order for multiple trips and store water in the constructed cemented tanks inside the compound.

The flood season is a blessing for the people of Kachi; it changes the intensity of the hot weather and fills up all the depression and lands field. Normally June-August when water is abundantly available in each corner of the plain human can dwell easily. Construction works normally start after the flood season when water is available in the depression close to the settlement which is pumped with small machines and used for construction. At the time of first flood hundreds of local residents come out of their homes, visit Narri River to welcome the water. Farmers simultaneously operate in their lands to manage water and help each other in filling the small breeches with tractors and handmade small tools. Priority is always given to fill the earthen reservoirs purposively made for domestic use water storage.

People have two types of home storage tanks facility; one for drinking and another for washing and cleaning. Normally when water is fresh in the earthen reservoirs, people consume it directly without any treatment.

In the year 2012-13 provincial governments provided water from Pat Feeder canal to Bhag town and other small villages coming alongside the pipe line in the Kachi Plains. The canal water is not clean and safe in quality for human consumption. The canal water is usually not utilized for drinking without boiling in Bhag town. The quantity of the water provided is not enough to meet the entire Bhag town needs.

British Colonials faced the shortage of the water for drinking and construction purpose while they build the Railway line from Jacobabad to Quetta passing Kachi plain. Alternatively they build underground tanks at all railway station in plain locally called Landi as a solution to the water problem. These underground tanks were filled by the by trains by bringing it from the Indus River canals in Sindh Province.

Even to this day, local running passenger's trains

pull a water tanker to fill the reservoirs for the staff working at Bakhtiarabad, Noutal and Mithri railways stations. Local earthen reservoirs were also constructed along these stations to collect spate water on availability. With the passage of time, the railways department has not maintained these reservoirs. Only one reservoir at Bakhtiar Abad railway station is maintained mainly by the local inhabitants to store the flood water for a small local population settled near the station.

All reservoirs do not have proper fencing and are thus exposed to wild animals, stray dogs. They use these reservoirs for drinking water which can affect the quality of water for humans.

The entire Kachi plain is devoid of ground water or it is saline and not used for any purpose. So, one cannot see boreholes in the area to exploit the ground water for any purpose. Every year in the early summer months, from March onwards, the filled reservoirs start evaporating and dry up quickly by mid-April. The river bed seepage is hardly available after Mid-April if there are no successive floods. In order to meet the drinking water needs, local inhabitants dig shallow wells in the river bed to extract subsurface seepage water which is sweet and clean without turbidity. Such open surface shallow wells are developed by the individual households seasonally but do not meet the needs of single family in 24 hours hence not shared with other households. One can see dozens of sunken holes in the river beds adjacent to the human settlement along the Narri River.



Figure 3: One of the drinking water ponds in Bhang Balochistan

Wealthy households buy water at Rs500 (5.00USD) per trip of donkey laden 200 liters load of water during water shortage times which is 5 times higher than the normal rates (0.5USD). People in Bhag Balochistan have informed that they also import water by tractors from Sibi city in time of scarcity





Figure 4: Seepage water collection from the dry reservoir May 2017

and one trip cost of a tanker is paid Rs.7000 (70USD).

Spate water followed by rains is the only water resource in Kachi Plain. The catchment of the Narri River is 1500<sup>2</sup>kms long and a large area extends in Loralai and Kohlu district in the north and lies in monsoon range and run off water flows in Narri River. Part of the catchment area consists of highlands of Ziarat District Mountains that receive heavy snow fall in normal winters and snow melt feeds Narri River and as a result small flows are available in river beyond Sibi city in good year which is utilized for filling of drinking water ponds in Bhag area. Small numbers of farmers grow melon and water melon if they get springs floods in Feb, March. So, generally water is available in Kachi area in the start of summer monsoon season but its surety is related to the weather broadly.

Narri River enters in Kachi Plain near Sibi city is only source of water for drinking, animals and irrigation use. Narri River passes in middle of the plain along the Jacobabad-Sibi highway which is intercepted by the farmers in the sequence being upstream first. When the land of upstream diversion (now mini barrages at 5 locations) are completely irrigated, the water is passed on to the next off take and so on even beyond the boundreis of Tahsil Bhag. There are more rivers intering in Kachi Plain its western parts known as Bolan, Sukleji, Kashusk and Mula. All these rivers flows west to east – then north to south while passing the Kachi Plain from its western edge. Water from these river do not irrigate any part of the Bhag Tahsil but utilized for spate irrigation and drinking in the other parts of plain in Bolan and Jhal Magsi district.

South-west parts of the Kachi plains, coming in

Bolan and Jhal Magsi district are more fragile in term of domestic water availability after the month of March. It has been observed that people living around Gandawa, a capital of Jhal Magsi district, migrate to the water courses flowing from Mula River in the area and stay there with their families and livestock to fight with summer's high temperature until rains comes. It is observed that many villages dwelling in lower plain have constructed concrete tanks to store water for domestic and animal use. Such tanks are filled by the tractor imported water on payments. If rains do not occur for longer time, most of the inhabitants of lower plain migrate to canal area of Nasir Abad district at the distance of 60 kms in order to find water and fodder for their animals.



Figure 5: Migration pattern to cannel area during water shortage in Kachi plain

## 6. Livelihoods in Bhag Narri

Local means of livelihood are spate irrigated agriculture, livestock, small scale sale of green fodder, selling water, daily wage and local area based small trades. Government employment and livestock rearing are the secondary source of income of the local population. Highland livestock breeders make their entry in the area in the month of November and stay until end of February every year in the Kachi Plains and Bhag area as well. The majority of the nomads come from the western highland of Mastung, Kalat, Chaghi and nearby border land of Afghanistan, all belonging to the different nomads Baloch tribes.

Largely nomads are buyers of standing crops or work as agricultural labor needed during harvesting time. The main objective of the nomads is to find green fodder for their animal in both

cases. The nomads have a good relationship with the local farmers in the Kachi Plain and they are seasonally visiting the area for centuries. Normally they live at the brink of the irrigated lands in tent houses. The Kachi plain hosts about 1 million small ruminants every year in the winter months.

There is an interesting interaction among the grower and nomads. Local farmer Abdul Sattar Bangulazi informed that the nomads are smart and they undertake reconnaissance of the cropped lands individually. After the assessment, they contact with the land owner and make the purchase deal of the standing crops. Once the deal is final, the nomads take the control of the cropped field and takes crop residues and wild fodder for their animal on daily basis. Upon ripening of the moth and mong beans, the entire family including children and women weed out the beans plants and let them dry inside the standing sorghum field. Once dried, it is taken to the plain ground and start manual dusting separate seeds from chuff. The net grains are then sold to the local traders in Bhag town in accompany of farm/land owner and pay their first installment. The final payment against the deal is made upon the sale of sorghum harvest. Mr.Sattar further said; nomad payback the price of purchased crop net harvest and profit to them is crop remains which are used as fodder which they need for their animal. If the market is good they make more savings and profits as well.

The majority of the nomads visits Bhag, Bolan, Mithri, and Bakhtiarabad seasonally and stays there during the winter months with their livestock and families since western highlands are cold and devoid of fodder in winters. With the start of spring season mid-march they travel back to their native area.

### Pastoralism

Common livestock are cows, bullocks and goats which are breed and kept largely for the domestic use. Almost 50% of the local residents in the area keep such animals to be sold in the Sibi Mela to have annual returns through animal sale. The famous cow breed in the area is Bhag Narri and this specie was introduced by the livestock department in the area to meet the nutritional needs of households by producing diary milk and to meet the fresh meat availability in Balochistan. In Kachi area there are farmers who keep flocks of such animals for commercial purpose.

Grazing of livestock is done at the fields during the harvest time when enough quantity of crops remains is available. After the harvest of Kharif crops, mainly in December when agricultural lands

are empty and yet contain the crops residues, these animals are grazed in flocks. As per arrangement, in the morning the owners of cattle bring their livestock to a predetermined place where it forms a large flock called Goram. It is taken to the grazing range by appointed 1-2 individuals called Dhanrwal. They do the day caring and spend the day in the range letting the animals graze and come back home in the evening. Such individuals are paid per head of animal monthly. Livestock, specially bullocks and cows are common economic activity in the area to supplement the household's incomes. The dairy products are usually not sold in the market. However, there are 200 small commercial vendors who keep buffalo to sell milk in the local market and in nearby villages to meet the local need.

### Crop cultivation

Farmers have indigenous knowledge for crop cultivation which relates to the Hindu Lunar calendar subject to the appearance of moon. Old people specially have deeper knowhow on it and general farming community keep them asking about the exact timings for cultivation of seeds to get better crops. It can be understood more in detail by going through the calendar. Months a detail together with the crop cultivation and harvesting timings are given attached as Annex "B" to this report.



Figure 6: Sorghum mixed with beans is a major crop in Bhag Blochistan

Practical farmers know the exact days and time for seed cultivation. They also discuss with each other about the timings especially on times for crop cultivation in different months and seasons. Due to more seasonal moisture availability in summer months, Sorghum remains the major crop of Kharief season followed by mong, moth beans and guar. Wheat is Rabi major season major crop followed by Jhambha (oilseeds) and chickpea are grown

at minor scale. Mostly farms are owner operated and main draught powers in the area are tractors with a small number of bullocks.

Moong and moth beans are considered minor crops which are not cultivated separately; it is cultivated mixed with the Sorghum. Mix cropping pattern is practiced to earn better amounts of cash having the good and poor sale rates of one crop and other. Other than sorghum and beans, local tinda (Mehal) is also cultivated to sell in the market as a local vegetable and for home consumption. Similarly, Lufa is also grown along the banks of drinking water reservoirs to meet the family needs. There is no ban of its picking, but the one who cultivates it has more rights on the product.

Guar, wheat, chickpeas and barely are minor crops in terms of cultivated acreage. Green chickpeas are also eaten as a green vegetable. The twigs leaf is cooked before the start of the flowering season. Anyone in the area is allowed to cut the chickpeas shoots before flowering for cooking or feeding to the animals. By doing this, the chickpea plant gives better yield. This is probably because chickpea plants are deep rooted and can extract more water for plant growth. Farmers say that if the plant is not trimmed by cutting or direct animals grazing, the plant growth become intense and the yield ratio declines.

Small numbers of farmers grow melon if the area receive spring season flood which occurrence is not common in Bhag. Due to poor road communication and none availability of improved seeds facilities water and musk melon are not grown at larger scale except in Mithri village in the peak upstream area. The Mithri musk melons are sweet in taste and makes better return upon harvesting in the months of May every year.

Pakistan spate network has been working on the climate adaptation in crop cultivation. Since the last few years, the summer rains became erratic and unpredictable and farmers are getting late season flood water and shift in crop is essential. In the year 2016, farmers were provided with small scale of chickpea seed which has resulted in good harvest. In the year 2017, the demand for chickpea seeds went high and farmers have shared the cost for the procurement of seeds in 800kgs. Farmers are also encouraged to grow lentil as well alongside the chickpea and utilize the late season's moisture more in effective way by producing high value crops.

## 7. Fauna

### Wild animals

Wild animals are common in the area, with the change of weather they make shift locally in the area. During the wet season when land cover is filled with crops, many animals find sanctuary to hide in it. They also live in the natural fleapits formed by the floods water along the river and in the cropped fields. Normally local men deal with them friendly especially with foxes and jackals that are not aggressive and other animals that do not cause any loss to the human life. The wolf's population decreased significantly, but recently it is reported that they have made their comeback. Local's inhabitant and pastoralist do not like wolfs as they attack and kill the livestock. Deer almost disappeared from the Kachi Plains but the rare species can be seen in the western Kirthar range. Wild rabbits are commonly seen and locals hunt them in the winter months. There is a need to educate the people on the moderate hunting of the animal.

Hyenas live in the nearby mountains. They normally do not attack other animals or humans and survive on the remains of dead animals and throw away bones that they find. The negativity, attached to Hyenas is that they are captured by the people and exposed to their pet dogs while people enjoy their fighting.

Wild animals are mobile and are sensitive to changes in their habitat. The past few decades have seen changes in the human populations, introduction of modern arms and ammunition, modern techniques of trapping and snaring and extension of road networks. These changes have paved the way for destruction of habitats of animals not only in the plains of Bhag/Kachi but all over the province. These changes which have been mainly instigated by the humans are generally termed as anthropogenic factors affecting the wildlife/animal populations. In addition to these, natural factors also play key role in affecting the wildlife populations in a given area. Among the natural factors, droughts, low vegetation cover that reduce the cover and food supply in an area also lead to low wildlife populations. Generally, habitat destruction has played a major role in lowering wildlife populations. This is followed by the indiscriminate hunting, snaring and trapping of wildlife species. Both of these factors have pushed many species such as deer, wolf, and hyena to the brink of extinction, while many species have been classified as threatened and endangered.

Table 2: List of Wild Animals in the area:

| S.No | Local name  | Scientific name | Remarks  |
|------|-------------|-----------------|--|
| 1    | Fox         | Vulpes vulpes   | Common in the area.  |
| 2    | Jackal      | Canis aurous    | Common in the area   |
| 3    | Hyena       | Hyena           | Number decreased and live in nearby mountain area of Kirther range |
| 4    | Wolf        | Canes lupus     | Numbers decreased  |
| 5    | Wild boar   | Sues scrota     | Appears mostly in sorghum season                                   |
| 6    | Pig wild    | Wild Boar       | Appears mostly in sorghum season                                   |
| 7    | Wild here   | Lupus spy       | Rear specie, local people hunt it for consumption                  |
| 8    | Caracal cat | Felix caracal   | Rear specie, but seen in the area.                                 |

**Reptiles**

Six types of species of reptiles exist in the areas that are listed in the table below. There is no human use of these species reported during the field visit. Normally people react to all species of snakes and kill them where ever they find them. Snake

bites are common in the flood seasons when all reptiles come out of their sanctuaries and prefer to stay on the dry surface that are usually villages or embankments of the fields. Vaccines of snakes' bites are always available in the local hospital at Bhag.

Table 3: List of Common Reptiles

| Reptiles | Biological Name | Remarks               |   |
|----------|-----------------|-----------------------|---|
| 1        | Common snake    | Serpents              | Common in local area. They mostly appeared in rainy season. Local reacts negatively to them |
| 2        | Black cobra     | Naja Nigricollis      | Not common but exists   |
| 3        | Lizard          | Varanus monitor       | Common in the area and no human use   |
| 4        | Geckos          | Hemidactylus frenatus | Common in the area and no human use   |
| 5        | Sanda Lizard    | Saara hardwickii      | Common. Not used for any purpose  |
| 6        | Girgat          | Calotes versicolor    | Common and not dangerous specie for humans  |

**Birds**

In the Kachi plains you have both local birds (table 4) and seasonal and migratory birds (table 5). Local birds normally do not move in any season and stay in the area. Aquatic birds moves to wet area of Dera Murad Jamali, Bolan and Sibi in peak dry months of summer. Some of the birds like See See and Chakur are mountain birds that live in the adjacent western Kirther range. They do not move to the plain lands in any season. Their habitat is more visible in the wild mountain. Locals hunters make trips on hunting these birds. In many parts like in Shuran and Jhal Magsi area, the local sardars and land lords do not allow their open hunting. As a result, their population is increased and these birds are now more visible in comparison to the past.

Seasonal and Migratory birds migrate in April and May for a very short period of time. Water birds migrate in June-July immediately after the rains and floods in the area and stay along the water

depression and drinking water ponds till the water is lost.

Most of the birds of Kachi plains are resident birds and are present throughout the year in the area. Only species of ducks, quail, rosy sterling and Houbara bustard are migatory birds which visit Kachi plains during different times of the year. Like large animals, birds are facing same fate. Birds of economic value especially those that are hunted have been indiscriminately subjected to hunting, snaring and trapping. For Houbara bustard, which has been classified as endangered species, hunting pressure is high and it is hunted from December to the end of February when local sardars host the Arab Sheikh annually. Hunting, snaring and trapping have very adversely affected the populations of both migratory and resident birds. Although no regular population surveys/census for species of birds have been conducted, still ocular observation and interviews of the resident community members indicate that populations of birds have been drastically reduced. In addition,

to the hunting, natural calamities such as drought, low vegetation cover have also taken toll on the

birds population. Most of the species of economic value are becoming rare in the Kachi plains.

Table 4: List of local birds

| Local Birds |                     |  |
|-------------|---------------------|--|
| S. No       | Local name          | Scientific name                            |
| 1           | Sparrow             | Passer idea                                |
| 2           | Green parakeet      | Psittarcarahologchlorus                    |
| 3           | Grey partridge      | Franclins                                  |
| 4           | Rosey Sterling      | Sturnus roseus                             |
| 5           | Duck                | Amauronic phoenicurus, Anas angustirostris |
| 6           | Chakur              | Alectoris graeca                           |
| 7           | See see             | Ammoperdix griseogularis                   |
| 8           | White Errand Bulbul | Pyennotus                                  |
| 9           | Red Vented Bulbul   | Pysennotus Cofer                           |
| 10          | Jungle Babbler      | Terdoides Striata                          |
| 11          | Hoose Crow          | corvus splendens                           |
| 12          | Maina               | -  |
| 13          | Loughing Dove       | streptopelia decaoto                       |
| 14          | Black patridge      | Francolinus francolunes asiae              |

Table 5: List of seasonal and migratory birds

| Seasonal and Migratory Birds |                    |                       |
|------------------------------|--------------------|-----------------------|
| S/No                         | Name               | Scientific Name       |
| 1                            | Macqeen Bustard    | Chkamyditus           |
| 2                            | Black Wing Stilt   | Himonropua            |
| 3                            | Spotted Owlet      | Athene Brama          |
| 4                            | Common Whoope      | Upupna epops          |
| 5                            | Green Beeater      | Morops orjentalis     |
| 6                            | Indian Roller      | Coracias benghalersis |
| 7                            | Common Kestrel     | Falco naumanni        |
| 8                            | Crested Lark       | Galerida Cristata     |
| 9                            | Quail              | Coturnix cotornix     |
| 10                           | Spotted sandgroose | Pterocles senegallus  |
| 11                           | Common Crane       | Grus grus             |
| 12                           | Rock Pigeon        | Columbalivia          |
| 13                           | Small Egrets       | Egreta Garzeta        |

## 8. Forests and Forge

Local trees are the main source of fuel wood in the area. Normally their ownership is private and they grow naturally. No artificial plantation of these trees is done at any time. There is need to introduce agroforestry by introducing and intensification of new plants through seed cultivation along the field and river embankments. This will cater to the local fuel wood needs and work as wind breakers and contribute to the overall weather.

A little change is observed in the population of individual plant species in the plant community. The species having the economic value have been affected either through direct harvesting such as Kandi (*Prosopis cineraria*), Peelo (*Salvadora oleoides*), Ber (*Sisyphus nummularia*) and Tamarix

(*Tamarix* spp) or through indirect use of livestock. For monitoring changes in the plant communities, no permanent plots have been established. Therefore, the research relied mostly on visual observation and informal interviews from the people in the area. In some areas where population pressure is relatively high and communities have sought to extract livelihoods from the tree and shrub species presented in their immediate environment, plant communities have borne the brunt in the shape of low plant densities and low populations of species of high economic value. Normally all households prefer to grow trees in their houses to take shelter against the summer months. Mesquite (*Prosopis*) is grown wild and its population is increasing in the area. Wood is extracted and used for firewood at household level and very few people sell it in the Bhag town.

Table 6: List of local plants and species and their local utility is given below:

| S/No | Local Names  | Scientific Names           | Local Use of the specie  |
|------|--------------|----------------------------|--|
| 1    | Kandi        | <i>Prosopis cineraria</i>  | Wood is used for local housing roofs and leaves are fed to the animal. Their bushy plants add the leaf and contribute to soil fertility.               |
| 2    | Ber          | <i>Zizyphus nummularia</i> | The fruit is eaten, leaf fed to animals and wood is used for making animals huts, etc.   |
| 3    | Peelo/Khabar | <i>Salvadora oleoides</i>  | Wild fruit tree consumed by humans. Used as fuel wood, it is not much common in Kachi area.  |
| 4    | Kikar        | <i>acacia jacquemontii</i> | Used for local low value furniture and roofing material. It is good for providing shade during summer months.  |
| 5    | Ak           | <i>Calotropis procera</i>  | No human use but small animal consume its dry leaves in winter months. And wood is used for domestic fuel  |
| 6    | Kanir        | <i>Nerium oleander</i>     | Poisonous plant not used for any purpose   |
| 7    | Ghaz         | <i>Tamarix</i> SPP         | It grows along the River, no any particular use accept camels eat the twigs of plan. Its branches are used to make animal sheds and temporary shelter. |
| 8    | Mesquite     | <i>Prosopis</i>            | Fuel wood is extracted and sold in local market. Charcoal is made out of it in some areas.   |

**Annex: A**

**Village wise – Barrage/Ganda Wise list of Ownership of Tribes**

| S/No | Name of diversion structure (locally called Ganda) | Villages on Right Bank (Nari River) | Estimated # of HH | Villages on Left Bank (Nari River) | Estimated # of HH |
|------|--|-------------------------------------|-------------------|------------------------------------|-------------------|
| 1    | ERRI   | Erri Shahr                          | 100               | Killi Rasheed Khan                 | 80                |
|      |  | Chandia                             | 20                | Bheeri                             | 100               |
|      |  | Goor                                | 100               | Killi Habib                        | 50                |
|      |  |                                     |                   | Killi Chandia                      | 50                |
|      |  |                                     |                   | Killi Shadi Khan                   | 30                |
|      |  |                                     |                   | Killi Gohramzai                    | 30                |
| 2    | Haji Shahr   | Haji Shar                           | 500               | Gola Mori                          | 8                 |
|      |  | Gadi Mehrullah                      | 20                |                                    |                   |
|      |  | Gadi Syed Aurang Shah               | 50                |                                    |                   |
|      |  | Gadi Madat                          | 25                |                                    |                   |
|      |  | Shadi Khan                          | 20                |                                    |                   |
|      |  | Chamb Beig Mo-hammad                | 40                |                                    |                   |
|      |  | Masoo                               | 50                |                                    |                   |
|      |  | Gola Raisani                        | 50                |                                    |                   |
|      |  | Basti Dandoor                       | 50                |                                    |                   |
| 3    | Tuk  | Tuk                                 | 200               | Ghulam Haider                      | 20                |
|      |  | Shabazo                             | 150               | Juma Khan                          | 40                |
|      |  | Chishti Kundal                      | 15                | Awan                               | 20                |
|      |  | Chishti Aslam                       | 30                | Killi Mohammad Sha-rif             | 20                |
|      |  | Mohammad Hashim Shahwani            | 20                | Killi Lawang Khan                  | 10                |
|      |  | Wafa Shahwani                       | 15                |                                    |                   |
| 4    | Ghazi Chandar                                      | Ghazi                               | 300               | Gamo                               | 60                |
|      |  | Balochani                           | 20                | Taakri Raisani                     | 20                |
|      |  | Darkhan                             | 20                | Taakri Mahar                       | 20                |
|      |  | Pahwan Shahr                        | 5                 | Taakri Bangulzai                   | 25                |
|      |  | Bashkia                             | 20                | Ahmadan                            | 10                |
|      |  | Mud Usman                           | 20                | Kona Chandar                       | 20                |
|      |  | Mud Sharbat                         | 20                | Yousaf Khan                        | 15                |
|      |  | Mud Mandwani                        | 20                | Chandar                            | 100               |
|      |  | Mud Bibi Skindar                    | 20                | Mohammad Pur                       | 40                |
|      |  | Khudaiadad                          | 50                | Mian                               | 60                |
|      |  | Shahan                              | 10                | Lund Bhund                         | 10                |
|      |  | Jangu                               | 50                | Lund Bangulzai                     | 5                 |
|      |  | Pahoor                              | 300               | Ghulam Mohammad                    | 10                |

|   |         |          |     |                            |      |
|---|---------|----------|-----|----------------------------|------|
|   |         |          |     | Muradani                   | 20   |
|   |         |          |     | Machi                      | 40   |
|   |         |          |     | Baran                      | 60   |
|   |         |          |     | Mero                       | 20   |
|   |         |          |     | Aziz Abad                  | 10   |
|   |         | Haji Jah | 250 | Thola                      | 50   |
|   |         |          |     | Gulan                      | 100  |
|   |         |          |     | Babr Ahmad Khan            | 20   |
|   |         |          |     | Tatar                      | 30   |
|   |         |          |     | Babar Ghafoor              | 20   |
|   |         |          |     | Babar Dodai                | 20   |
|   |         | Khokhar  | 40  | Buda                       | 250  |
|   |         | Sona     | 25  | Buda Thora                 | 200  |
|   |         | Gowarani | 40  | Mir Khan                   | 60   |
| 5 | Khokhar |          |     | Doni Wazir Khan            | 40   |
|   |         |          |     | Doni Gulsher               | 10   |
|   |         |          |     | Korani                     | 30   |
|   |         |          |     | Mohammad Taqi              | 10   |
|   |         |          |     | Kazi Kamal                 | 10   |
|   |         |          |     | Mungur                     | 50   |
|   |         |          |     | Behram Khan                | 50   |
|   |         |          |     | Deno Machi                 | 10   |
|   |         |          |     | Safar Abra                 | 5    |
|   |         |          |     | Fatwani Bangulzai          | 5    |
|   |         |          |     | Naushara                   | 20   |
|   |         |          |     | Hadwar                     | 150  |
|   |         |          |     | Mondrani                   | 150  |
|   |         |          |     | Kalri                      | 50   |
|   |         |          |     | Tangoti Arbab              | 50   |
|   |         |          |     | Hamid Basti                | 50   |
|   |         |          |     | Tangoti Khan Mo-<br>hammad | 20   |
|   |         |          |     | Chalgri                    | 500  |
|   |         |          |     | Dashti                     | 40   |
|   |         |          |     | Bhag Town                  | 5000 |



## Colophon

This Practical Note was executed in Nov-2016 – Jan 2017 by the Flood Based Livelihoods Network (FBLN) Pakistan –in Association with SPO (Strengthening Participatory Organization) National Center, First Floor Ahmad Arcade, Street 169, G-13/3, Islamabad Pakistan

Content and layout formatting and editing by: Madiha AlJunaid.

For more information: [www.spate-irrigation.org](http://www.spate-irrigation.org).



Flood-Based Livelihoods  
Network Pakistan



Flood-Based Livelihoods  
Network Foundation

