

A photo book based on insights and outcomes of the project "New water rights for basin management and inclusivity in spate irrigated areas of Pakistan".











Introduction to the photo book

Spate irrigation is a unique water resource system that makes productive use of short duration floods in dry riverbeds. It is common in Pakistan, covering an area of 1 million hectare. This photo book aims to give an impression of two spate irrigated areas in Pakistan. These areas are located in Sindh and Balochistan provinces and are respectively called Nai Gaj and Bhag Narri. After an introduction of this photo book and the project, the areas are visually introduced. Different themes within the project, e.g. the use of floodwater and livelihood opportunities, are highlighted in the chapters following. This photo book is built around the work packages from the NeWaRBi (New water rights for basin management and inclusivity in spate irrigated areas of Pakistan) project. This photo book is meant to both inspire and inform the reader about spate irrigation in these areas and the NeWaRBi project.

Introduction to the project

The NeWarBi project aims to optimize the current spate systems by revising the water distribution rules in those dry river systems that have benefited from technical interventions in the headworks. It is envisioned that the systems are brought up to date after changes made to main headworks and resource use, thereby optimizing their overall productivity and promoting their inclusivity, especially for the weakest downstream users. In addition, a whole range of improvements – related to crop agronomy, livestock keeping, small mechanization and water storage, based on proven experiences elsewhere in similar water systems (as documented by the Flood Based Livelihoods Network (FBLN)) is being introduced through farmer groups. The project is jointly implemented by MetaMeta, SPO (Strengthening Participatory Organisation), RDF (Research Development Foundation), Government of Balochistan Irrigation and Power Department and SIDA (Sindh Irrigation and Drainage Authority).



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SPATE IRRIGATION IN PRACTICE AND PICTURES

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SPATE IRRIGATION IN PRACTICE AND PICTURES



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Someone once told me, that if you are bitten by the spate irrigation bug, it will never leave you. Spate irrigation is one of the most fascinating and ingenious resource management systems in the world. They demonstrate the human talent to build a living out of fragile resources.

"

Frank van Steenbergen (Director, MetaMeta)



Part 1 Area Introduction

In this map of Pakistan, the two project areas are outlined; Bhag Narri in the province Balochistan and Nai Gaj in the province Sindh. Nai Gaj is a large hill torrent in Dadu District. It feeds the largest spate irrigated areas in Sindh Province (40,000 ha). The Government of Pakistan has recently constructed Nai Gaj Dam on its stream – effecting its hydrology considerably, with sediment now held in the upstream reservoir and less water travelling further downstream – including Lake Manchar.



With approximately 90,000 ha of command area, the Narri River is probably the main spate river in Pakistan in terms of area served. The spate irrigation system along the Narri in Bhag has seen major investments in diversion structures, which have affected the water distribution pattern. The earthen diversion bunds that were used for centuries, have since 2015 been replaced by six government-operated mini barrages, constructed by the Balochistan Provincial Irrigation Department.



Introduction to project areas

The following pictures provide a general (visual) introduction of Bhag Narri and Nai Gaj. Very common and more specific features are highlighted.

Bhag Narri

Partially abandoned settlement in an area which was formerly depending on spate irrigation as the source of livelihood. Because the water has not reached the area for over 10 years, the households migrated elsewhere.



Flooding in one of the communities.

This pond is located on the sides of the settlement and has just been refilled by floods.



Waterfall in Bolan River.



One of the historical places in Bhag. This structure was built in 1780.

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A group of goats at one of the water ponds in the area. These ponds are also used as source of water for livestock underlining their importance for the well-being of the community.

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A once prosperous place that was abandoned as the spate flows do not reach this place anymore.

One of the historical buildings Sobat Sirai at Sibi.





Marking of Nao Wah at the starting point of Nai Gaj from where command area of Nai Gaj Starts.

NAC

NAH

Nai Gaj

A beautiful view of Nai Gaj during its lower flow from the starting point of the command area.

Nomads from mountainous area perch their straw made homes in the area for grazing their livestock in Nai Gaj command area.

A child playing in of the drinking water ponds after the first floods took place.



Meeting in village Lashkar Bhurgri to collect data for the baseline survey.

Temporary bridge, in order to transport and travel during floods until a permanent bridge is constructed.



Nai Gaj

Children standing on the inlet of a flow, enjoying a dive in the irrigation canal.

One of the dry riverbeds, through which part of the year water flows, feeding the spate irrigated areas.



Nai Gaj

A damaged bridge caused difficulties for people from several villages. The roads department started working on this bridge and temporarily some planks have been laid out to allow crossing the canal on foot.

Nai Gaj

Group of farmers during a field visit in preparation for the project.

Bhag Narri

Group of people portraying at a partially abandoned settlement in an area which was formerly depending on spate irrigation as the source of livelihood.





A group of children at one of the drinking water ponds in the Bhag Narri system.

Bhag Narri



Partially abandoned settlement in an area which was formerly depending on spate irrigation as the source of livelihood. The settlement is located in the lower ends of the system and has not received water in the past years, leading to an out-migration of the households to other areas.

Bhag Narri

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Camels are one of the common livestock types in spate irrigated areas. Part of the mountains through which water reaches the plain areas can be seen in the background.

A business man is weighing and selling grains on the street, which are sold as a form of animal feed.

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I belong to a rural area in Balochistan, where spate irrigation has already been practised for centuries. Irrigated fields, after the rains, are a source of happiness for all of us in the area. However, more work is needed to improve the system.

"

Abdul Salam (Assistant Sociologist, SPO)

Part 2 Theory of Change

The NeWaRBi project aims to contribute towards the re-setting of water distribution rules in Nai Gaj and Bhag Narri, thereby promoting efficient water use in agriculture for better livelihood opportunities. This requires a range of activities, including training, capacity building, empowerment of the weakest stakeholders, lobby and advocacy at the district level, and command area infrastructure development. There is a need for a good mix of expertise related to both social change processes and concrete action in the field of water management rules and regulations and improved practices, which is provided by the project partners. This can unlock the growth potential of the spate irrigation systems.

The project consists of 5 Work Packages:

- 1. Inception phase
- 2. Improved and equitable utilization of productive floodwater (part 3 of this photo book)
- New livelihood opportunities through improved land and water management practices (part 5 of this photo book)
- 4. Outscaling and dissemination of recalibrated water distribution rules and livelihood opportunities (part 7 of this photo book)
- 5. Project closure







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In the inception phase of the project, I found out how farmers from other countries apply innovative methods in spate irrigated areas, while farmers from Nai Gaj stick to old methods. Therefore, I feel the need to work proactively on this project, so that farmers in Nai Gaj can I am optimistic that this project will help farmers in Nai Gaj and beyond to fully enjoy spate irrigation systems benefits.

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As part of the inception phase, a both social and technical baseline study has been executed by Mehran University of Engineering and Technology (Jamshoro) at the start of the project.

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Samples have been taken from drinking water ponds, in order to test the current quality of the water on biological contamination. The samples taken from the drinking water ponds are stored at lower temperatures until analysis in the lab can be carried out.



Household surveys took place as part of the baseline survey to obtain insight in the current status of the households and their strategies.



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Improvements in spate irrigation can make lot of difference in the lives of the communities who depend on it, in multiple ways.

This project is the first step to bring the spate irrigation in focus of concerned stakeholders and to make the farming community realize the true potential of the spate irrigation system, while taking steps in improving irrigation, land management and marketing.

"

Niaz Hussain Sial (Community Development Specialist, RDF)
Part 3 – Work Package 2

Improved and equitable utilisation of productive floodwater

Bhag Narri

Focus group discussion with elders in the community to introduce the project and identify the needs at different barrages, command areas and networks.

Water is taken from the pond by the donkeys and people for household purpose. The ponds are filled by the floods that take place during the monsoon season and support the communities in the dry season. In the flood season, the filling of the water ponds is giving priority in the division of the available water.

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Via this diversion dam, which consists of a number of gates that can be opened or closed to control the amount of water passing through structure, the water (diversion) can be controlled which, if well managed, contributes to an increased efficiency and production of crops.

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One of the mini-barrages that was recently built in Bhag river. This barrage has several sluices, which makes it possible to better manage the (flood) water flows and distribute water to downstream parts of the catchment.



The chuff biomass from mung and moth beans has been collected and is placed on a truck to be transported to the markets in Quetta to be sold as livestock feed.

Sorghum panicles after harvest. They will be left to dry in the sun after which the kernels are separated.



The sediments that come with the flood water can, if not managed well, cause problems and bring damage to structures and roads.

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Structure to divert the flood water in order to protect the road.



This 10-mile-long diversion boulder was first constructed in 1930s to divert Nai Gaj water from eastwards to southwards. After it was damaged in 1995 by an enormous flood, it has been reconstructed in 1996.

Nai Gaj

One of the two lined channels which are meant to divert water for the Nai Gaj river, after completion of the Nai Gaj dam.





Land preparation in Nai Gaj spate system, constructing diversion structures and field bunds.

A rain and flood water harvesting pond in Village Chidri.

Mung and chickpea crops, mostly grown by farmers in upstream areas of the command area of Nai Gaj. A farmer struggling to close the breach, after fully irrigating his piece of land, called Bana, using branches of trees and soil.

Method of irrigating land. A group of 8 to 10 sturdy men have to work hard to control and plug leaks.



Meeting in village Wali Muhammed Jo Gandho as part of the formation of Farmer Networks.



Inspection of one of the newly constructed embankments in Nai Gaj, Sindh.







Nai Gaj

Community meeting in Sindh. Community members develop a map of their community with land marks such as the school, water points, etc.

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Farmer in his field walking home after a days' work.





Farmers checking and grading their harvest.

Meeting among a group of farmers.

Group discussion with farmers in Bhag Narri while enjoying traditional dishes prepared with produce from the spate fields.



This wadi only occasionally transports water and is dry for most parts of the year. Sedimentation can have a great effect on the course of the waterflow.

The clay soil has cracked significantly, due to evaporation and the high clay content of the soils that were deposited during floods. In spate irrigation, it is extra important to store soil moisture optimally, because cropping often takes place on only one irrigation turn.

Khatoor, flow division point in Bhag river, Balochistan. The right course is the natural course of the river, but due to the building of dams across the river to divert the water, the river has taken the left stream as (new) natural course.

One of the embankments of the Khatoor flow divider, which is currently dysfunctional.



"

I loved expanding my knowledge of remote sensing analyses of irrigated systems with spate irrigated systems and creatively coming up with better monitoring and prediction methods, for this highly dynamic form of agriculture.

"

Esmee Mulder (MetaMeta)

Catchment Nai Gaj, Pakistan



Part 4

Remote Sensing

As part of the NeWaRBi project, a remote sensing analysis was conducted. The aim of this analysis was to obtain an overview of floodwater and biomass production distribution of the past years. This can be used to contribute to the discussions on improved and equitable utilization of productive floodwaters. Additionally, it can be used to identify areas of interest for increasing water productivity and biomass production. Finally, by continuing this analysis over the project period and thereafter, the results can be used to monitor the water and biomass distribution to contribute to evaluating the effect of the interventions.

Image showing the Digital Elevation Model of the catchment from which water is supplied to the Nai Gaj spate system. This model shows that an area of over 5,000 km² provides the water on which the area, including the Manchar lake in the Southern part, depends.



Timeseries of the biomass production in Nai Gaj in 6 selected sites. The graphs show the kilograms of biomass produced per cubic meter of evaporated water. The peaks in production can be identified around the months of July – September, when the spate floods normally arrive in the area.

> Catchment Bhag Narri, Pakistan 45

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Image showing the Digital Elevation Model of the catchment from which water is supplied to the Bhag Narri spate system. This model shows that a catchment area of over 20,000 km² provides the water on which the Bhag Narri system depends.

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Evanoration 2014 [mm]

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Chatchment channels



Timeseries of Evaporation (yellow), Total Biomass Production (Green) and Total precipitation in the catchment (Blue) for Bhag Narri. The peaks in biomass production can be identified around the months of July – September, when the spate floods normally arrive in the area.



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We plan to introduce improved varieties of seeds in Bhag Narri which are already being cultivated in similar spate irrigation regions. We also plan to involve agricultural experts for the demonstration of good practices like dressing seeds, field visits and famer to farmer learning. Water quality is also addressed, via the introduction of smart technologies, improving earthen water ponds and storage at home.

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Allah Bakhsh (Project Team Leader, SPO)

Part 5

New livelihood opportunities through improved land and water management practices

A farmer in Wachho Pat diverting the water to his fields. The water is pumped from a well using solar power.

station, or other state

5.1 - Additional water management and water use practices

Nai Gaj

A small low-cost tube well on solar energy is used by a progressive farmer in Village Wachho Pat to grow vegetables and fruit trees.



Donkeys are used for the transportation of water from the drinking water ponds to the communities. Especially towards the end of the dry season, when the water ponds are drying up, communities are dependent on this form of transport for their source of water for domestic use.

Demonstration of water filters, which will be promoted in the project as one of the ways to increase quality of drinking water from the ponds. The filter uses gravity to 'pull' the water through a ceramic element removing up to 99% of the harmful bacteria.



Water is taken from ponds through jerrycans and transported by donkeys for household purposes.



Water is pumped from ponds through a small petrol pump into drums which will be transported to the houses by donkeys. The water is collected for household purposes such as drinking, cooking and bathing.





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Dadu is one of the poor districts in Sindh, and the area of Nai Gaj lies under this district. I am happy to be part of this project as the project initiatives and inputs will not only bring visible changes in the area but will also contribute to the economic upliftment of the communities of Nai Gaj. The formalization of the water system and equitable distribution are the key to success of this project. And I am hopeful for the success of this project"



5.2 - New crop varieties/crop/cropping practices

Nai Gaj

Sorghum is the main crop in the Nai Gaj spate-irrigation area.

Farmer in his field, which is currently under production with an intercrop of sorghum.

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Traditional method for the drying of the harvested sorghum.

Farmers collecting mooth beans from a sorghum field. These two crops are often grown in intercropping. Intercropping is one of the strategies to spread the risk of lower market prices for one of the crops.


This sowing machine is used to prepare the land and sow the seeds. Farmers cultivating fields in the spate systems often hire the tractor and sowing machine during the planting season. Only farmers with a large landholding are able to own their own machinery.



The harvest of moth and mung beans (green in far end is mung) is on the land, dried and ready to be packed and transported to the market.





Clay pots used to store seeds which will be used during the next cropping season.

Nai Gaj

Grafted Jujube is grown by a progressive farmer on a small low-cost tube well.



This plant, locally called trooh, is a wild medicinal plant common in whole Nai Gaj are. Due to a lack of knowledge, its barely used or sold.

5.3 - Value chain practices, processing, or grading







Nai Gaj

This donkey flour grinder is a traditional method and grinds flour for a whole village.

A roadside vendor selling famers tools. In upper row scythes or sickles, and in the lower row axes.

This electric flour grinder can be used an alternative for the donkey flour grinder. It runs on the electricity grid but also has the option to run on solar energy.

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Flour grinding with 3 small mills in Village Chidri in Sindh.

This flour mill has been developed by a local blacksmith and can run on solar power. This makes it viable for a village without an electricity connection from the grid.



Transporting and selling of the biomass remaining after the seeds have been removed during harvest. The biomass is packed in bales and transported to areas where pastures are not available and where it is used as livestock feed. 11.11



This mill is used to extract oil from oil holding seeds such as mustard.

This is what remains after oil extraction from seeds. These crushed remains are a highly nutritious form of animal feed.





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In Sindh, the Nai Gaj area –having spate irrigation system is a special zone where there is considerable scope to improve the productivity of the existing areas in terms of agriculture and other social development aspects. To achieve this there is a need for coordinated efforts by all stakeholders to work under this project. Thus, RDF is trying to take on-board the line departments to take joint appropriate and innovative actions for betterment of the lives of people living in the catchment area of Nai Gaj.

Aftab Akhund (former Program Manager, RDF)

5.4 - Livestock and poultry practices

A drinking place for livestock which is filled from a shallow well.

Nomad families descend from the western mountainous area of Balochistan with their large sheep and goat herds to graze during crop harvesting season.

Bhag Narri

Famous Bhag Nari Breed cows are kept at the house of the owner and eat fodder at this place. In particular periods of the year, they are allowed to graze on the fields, after harvest has been collected.

Boys bringing their goats back home after a day of grazing. Rearing goats is one of the livelihood strategies in Jhal Magsi Balochistan.

Brooding hens are often reluctant to leave the eggs. They will not eat and drink and will often lose a lot of weight. If you use a hatching pan (hazal), the brooding hen can eat and drink without leaving the eggs. The hatching pan helps the hen remaining stronger and healthier and she will take better care of her chicks.

5.5 - Other livelihood practices

Bhag Narri

Increasing pond size in the dry season to be able to store a larger volume of water during the monsoon. This will help to support the community with more water. annu i

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Bhag Narri

Transporting harvested firewood home to use for cooking and heating of water.

An old bull cart, resembling one found Moen-jo daro, which is an archaeological site dating back 5000 years. The rare bull cart is still in use in some villages in Naj Gaj area.



Bhag Narri

Focus group discussion to identify good practices and challenges in the communities dependent on spate irrigation.

Nai Gaj

Women in Village Fateh Brohi discussing the activities under the project and providing input in the design of the gender-related activities.



Alternative livelihood derived from making products from wild plant pesh, one of the sources of additional income, especially for women in the villages





Sharing of local best practices and alternative livelihoods from spateirrigation brochure, allowing the community to discuss what practice fits well with their situation.



Flood-Based Livelihoods Network Foundation



Improved Livelihood Opportunities in Spate Irrigation

In this document several improvements in the management and utilization of spate irrigation systems are presented, based on good practices in different spate irrigation systems in the world.

www.spate-irrigation.org

In this document, several improvements in the management and utilization of spate irrigation systems are presented, based on good practices in different spate irrigation systems in the world. Available via https:// floodbased.org/ projects/newarbi/.



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Although women have multiple important roles in spate-irrigated agriculture and in rearing livestock, their condition in the spate areas of Pakistan is deplorable. They do not have control over farm income, nor do they have a say in decision making.

"

Letty Fajardo Vera (MetaMeta)

Part 6

Gender Approach

In both Nai Gaj and Bhag Narri, well-being surveys were undertaken to gain a better understanding of the well-being of women in the spate-irrigated areas. Questions were asked related to water, agriculture, additional sources of income, health and education. Like elsewhere in rural Pakistan, women are denied inheriting the land rights, so they are deprived of the family assets after their marriages. Even when women obtain landownership, they find it difficult to cultivate their fields themselves due to the lack of labour force and draught animals, as well as cultural or religious constraints.

Besides taking care of the household activities and the children, women also join in during the work in the fields. They support the male farmers during harvest time and are partially involved in the sale of harvested crops. Furthermore, women are in charge of seeds and storage of crops. While animal grazing is mostly the male farmers' job, the females are responsible for caring for the animals and milking. Although women play multiple important roles in spate-irrigated agriculture and in rearing livestock, their condition in the spate areas of Pakistan is deplorable. They do not have control over farm income, nor do they have a say in decision making.

The project adopted several starting points to close the gender gap in flood-based areas, which are listed below.

- 1. Gender mainstreaming
 - Opportunity for women to set own priorities for development
 - Improvement of living and working conditions
 - Create awareness, more access to education
- 2. Implementation and organization
 - Work through existing structures for longevity, sustainability and legitimacy
 - Working methodologies in line with the organization and capacity of the women
 - Promoting practical equipment and tools adapted to women needs and local circumstances

These locally made clay pots can be an extra source of income. The pots are used for storage in the household setting. Water can be stored in these pots and the clay pots help to keep the water cool.



Village Pat Gul Muhammed

Women work in handicraft, making traditional cloth. For sales, they depend on intermediaries who come from time to time to the village and buy at a price set by the intermediary.

Village Pat Gul Muhammed



Women produce ropes from dwarf palm. For one day of hard work, they earn the equivalent of 10 euro cent.





Village Fateh

In this one-year kitchen garden program, 30 women learned to grow different vegetables, mostly for home consumption.

High water insecurity; open pond is used for both people and animals impacting both the availability of water for the household as well as the quality of the water.





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I hope that through this project we can bring improvements to the families in Bhag Narri and Nai Gaj, while at the same time also strengthening the role of spate irrigation in acting as a system that is able to tackle climate variability and change.

Also, we aim to develop a solid base for the approach to be applied in other spate irrigation systems in Pakistan, via this project.

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Part 7 – Work Package 4

Outscaling and dissemination of recalibrated water distribution rules and livelihood opportunities

Within Pakistan, spate irrigation occurs in each province, however, it is a largely unknown resource system in the water and development sector in Pakistan. The core of this work package is that the approach and methods developed under the NeWaRBi project, are shared and introduced in other basins that depend on flood flows.



Meeting with government department to introduce the project and have a discussion on the contribution of the project partners.



Flood-Based Livelihoods

The Pakistan Chapter of the FBLN (Flood-Based Livelihoods Network) has an important role in reaching these goals. Strengthening it as a self-evolving and self-financed network is therefore important.





Several overview paper and practical notes will be written, based on the NeWaRBi project. They are accessible via the FBLN website.

Papers, notes and manuals are translated to the appropriate languages.

Effect of dam construction on underground flows in Jamshoro, Pakistan

Effect of dam construction on underground flows in Jamshoro, Pakistan

by Abdul Ghani Soomro and Anila Hameem Memon February 12, 2020



Via <u>www.thewaterchannel.tv</u>, several blogs regarding experiences and developments in spate irrigation, by different authors, are shared from time to time. Also a series of videos will be produced and shared through TheWaterChannel.



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Spate irrigation possesses high potential for contributing to food security and improving the livelihoods of engaged communities. Therefore, I foresee that, despite challenges, this project helps improving spate irrigation in the Nai Gaj area in Sindh and beyond.

"

Ashfaque Soomro (Executive Director, RDF)

Part 8 External Influences

Communities in spate-irrigation areas, face several challenges. These challenges affect the context in which farmers operate. While locusts and floods are returning challenges, COVID-19 infections and the consequences of the lockdown measures cause additional shocks to communities. To provide an overview of the observed effects, the measures taken but also an outlook towards the future in terms of long-term effects and opportunities, schemes have been created. The NeWaRBi projects aims to increase communities' buffers to better deal with these challenges, referred to as external influences.




Floods regularly cause major damage, like the flood in the picture of 2020.

A farmer is worried about the predicted rain, while the chickpeas are ready for threshing.

Rain has devastated a large portion of chickpeas field when water ponded on the field.







Locust

A locust swarm in Sindh (source: Manoj Genani).



Locust

A close-up of locusts on a field in Sindh (source: Manoj Genani).





Quick legenda

Red: measures at national level

Orange: main outcomes for rural people

Grey: main economic outcome

Light Green: main COVID-19 related effect

Dark Green: main threat for farmer

Purple: opportunities

COVID-19

Legend of the colours used in the overviews related to COVID-19 (analysis developed by Judith de Bruijne).



In order to be able to prepare for the coming season, the expected impact on agriculture and trade were analysed.



This scheme addresses the specific impact on vulnerable households, including female-headed households.



This scheme describes how the COVID-19 pandemic can be used as an opportunity to 'break the vicious circle'.

Part 9 Project Partners

MetaMeta

Since more than a decade, MetaMeta is involved in the development of spate irrigation systems in Pakistan. Over the years, it has gathered a considerable knowledge base in the field of efficient use of surface and groundwater, rules and regulations for the management and use of (ground)water, and technical guides and manuals. MetaMeta has a unique position in flood-based farming – convening the Spate Irrigation Network (renamed Flood Based Livelihoods Network in 2016) since 2005. The network consists of professionals, practitioners and farmers. At present the network has more than 900 members. It is being run by a small part time international team whereas in seven countries national chapters are set up: Afghanistan, Ethiopia, Kenya, Malawi, Pakistan, Sudan and Yemen, though activities are not confined to these countries. The interest of MetaMeta Research in the project output and outcome is to further expand its experience with the provision of business services, to create tangible economic benefits for farmers by making needed improvements in the value chains of crops that are common to spate irrigated areas. Website: https://metameta.nl/

MetaMeta

Group picture of the MetaMeta Flood-Based Livelihoods Network team in Sudan. From left to right: Letty Fajardo Vera, Esmee Mulder, Abraham Mehari Haile and Reinier Veldman.

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SPO (Strengthening Participatory Organisation)

Strengthening Participatory Organization (SPO), registered in 1994, is one of the leading Pakistani rights-based Civil Society Organizations (CSO) in terms of country-wide presence and outreach. SPO has the mission to support and strengthen disadvantaged communities and public interest institutions for sustainable development. Outputs and outcomes of the project will give a new impulse to ongoing efforts to improve the economic and social status of farmer communities that depend on spate irrigation. SPO is already running programs in spate irrigation and is a long-term partner of MetaMeta through its Flood Based Livelihoods Network and hosts the Pakistan chapter of the FBLN. Furthermore, it has a long engagement with the Provincial Departments.

Website: <u>https://spopk.org/</u>



Left: Allah Bakhsh – Project Team Leader; and Right: Abdul Salam – Assistant Sociologist.



RDF (Research and Development Foundation)

Registered under Societies Act 1860 in the year 2002, RDF is an action research and development organization working in Sindh Province, Pakistan. RDF envisions an equitable and eco-friendly world with the mission of innovating solutions and building social institutions. RDF has agriculture, water and climate change in its focus area. As an implementing partner, RDF is contributing to optimal utilization of the immense potential which spate irrigation offers, with environment friendly activities. Together with stakeholders, RDF is finding out problems, challenges and opportunities in Nai Gaj. RDF furthermore focuses on improving flood water distribution, capacity building and the linkages from farmers to markets and governments. Website: https://rdfoundation.org.pk/





Government of Balochistan Irrigation and <u>Power Dep</u>artment

The interest of the government in the output and outcome is that the project promotes more resilient and economically empowered communities through the recalibration of water resource management rules, and the promotion of more appropriate agronomic practices upon which business models can be build. The local government bureaus are closely involved in the implementation of the project and will take care of the operational side of new water distribution practices in the future.

The Irrigation and Power Department works on harnessing the precious water available in small streams, springs and hill torrents through the construction of small weirs, flood diversion structures, small storage and delay action dams and lining of canals. Thereby, the department aims to enhance agricultural production in the province.

Website: https://balochistan.gov.pk/departments-download/irrigation-and-power/



Sindh Irrigation and Drainage Authority (SIDA)

SIDA is responsible for the sound operation and maintenance of water distribution structures. Its added value is to assume responsibility for future operation and maintenance of systems, following the process of water distribution recalibration and introduction of new cultivation practices. In addition, SIDA is a crucial party in the operation of the barrages together with farmer groups. In doing so, the water bureaus play a mediating role to ensure equitable distribution of floodwaters between upstream, mid-stream and downstream farmer groups.

The main tasks of SIDA are to supply water from the barrages to the canals, to levy water charges from water users and to construct, operate and maintain irrigation, drainage and flood protection infrastructure.

Website: https://sida.org.pk/



SIDA and RDF have inked the Memorandum of Understanding to strengthen water management and farmers' capacities in spate areas of Sindh. Chairman SIDA Engineer Abdul Basit Soomro and Executive Director RDF Ashfaque Soomro signed the MoU.

More materials & further readings

On the website of the Flood-based Livelihood Network, much more relevant materials can be found. For videos on spate irrigation and other flood-based livelihood strategies, the website of TheWaterChannel is a great source.

Project website: https://floodbased.org/projects/newarbi/ FBLN website: https://floodbased.org/documents/ Resource Documents: https://floodbased.org/documents/ Photo library FBLN: https://floodbased.org/documents/

Colophon

In this project, we collaborate with the Sustainable Water Fund, a programme from the Netherlands Enterprise Agency. The Netherlands Enterprise Agency uses the Sustainable Water Fund to stimulate public-private collaboration in the water sector on behalf of the Ministry of Foreign Affairs.

This photo book has been compiled as part of the NeWaRBi (New water rights for basin management and inclusivity in spate irrigated areas of Pakistan) project by MetaMeta, RDF (Research Development Foundation) and SPO (Strengthening Participatory Organisation).

This photo book was prepared by Allah Baksh (SPO), Gulsher Panhwer (RDF), Reinier Veldman (MetaMeta) and David Mornout (MetaMeta). Maps have been made by Taye Alemayehu (MetaMeta). The remote sensing analysis has been performed by Esmee Mulder (MetaMeta). Allah Bakhsh (SPO) and Gulsher Panhwer (RDF) have provided most of the pictures.

For more information and resources on Spate Irrigation and other Flood-Based Farming Systems visit <u>www.</u> <u>floodbased.org</u> or contact us through <u>info@floodbased.org</u>.









Ministry of Foreign Affairs





Flood-Based Livelihoods Network Pakistan



Spate irrigation is a unique water resource system that makes productive use of short duration floods in dry riverbeds. It is common in Pakistan, covering an area of 1 million hectare. This photo book aims to give an impression of two spate irrigated areas in Pakistan. These areas are located in Sindh and Balochistan and are respectively called Bhag Narri and Nai Gaj. After an introduction of this photo book and the project, some maps and remote sensing images are shown and discussed. Furthermore, some general pictures are shown, followed by pictures on (use of) floodwater and livelihood opportunities. This photo book is built around the working packages from the NeWaRBi (New water rights for basin management and inclusivity in spate irrigated areas of Pakistan) project. This photo book is meant to both inspire and inform the reader about spate irrigation in these areas and the NeWaRBi project.









Netherlands Enterprise Agency



Flood-Based Livelihoods Network Pakistan