

## BACKGROUND TO SPATE IRRIGATION



*Figure 1: Fetching water from the Spate channel*

Spate irrigation system is a form of water management that diverts seasonal spate or flood water for irrigation through building temporary earthen, brushwood and stone made dikes in the river bed of hill torrents. In Pakistan, spate water is not only utilized for irrigation but livestock, filling domestic water ponds, forage production and ground water recharge besides irrigation in piedmont area or down plains. Spate irrigation depends on short duration floods in summer after monsoon rains June through August and winter rains in December through March in low land of Pakistan when water flows in dry nullahas or streams or river for

short span of time. Some of the nullah/river have seasonal perennial water as well which is also used for the irrigation alongside the spate. (Ephemeral Rivers) locally identified (Nai in Sindhi), KhwaR in Pashto, Taal, Nai or Rodh Kohi in Saraiki, Kaur in Balochi. Land irrigated by this resource of water is called Rodh Kohi in Punjab and Khyberpakhtoonkhawa, khushkaba or sailaba in Balochistan and Nai in Sindh.

Spate irrigation is practiced in other countries like Sudan, Eritria, Yemen, Morocco, Somalia, Algeria, Libya, Mongolia, Kazakhstan and Pakistan. With reliable estimate, local farmers throughout Pakistan can irrigate 1.7 million hectares in good year otherwise it reaches hardly to 0.33mha in other areas out of its total potential of 6.935 million hectares of land in Pakistan (NESPAK 1998). In all provinces 22 million people depend on spate irrigation and own land resources largely in Balochistan Province. There are hundreds of potential sites through country that offer livelihood enhancement leading to economic growth and poverty alleviation through spate irrigation interventions. Spate irrigation is largest source of irrigation after conventional irrigation based on Indus basin but is neglected from the mainstream development. Pakistan's poorest of the poor people lives in spate irrigation areas with less civic amenities like education, clean drinking water, and poor health conditions, road communication and low family incomes. Under given table further highlights the importance of spate irrigation development scope showing the conservation sites. (NESPAK 1998 master feasibility study)

Area/Province	Number of Potential Sites
Federal Area	-
Northern Areas and AJK	120
Khyber Pahtoonkhawa (KPK)	417
Punjab	211
Sindh	33
Balochistan	423
<b>Total Feasible Sites</b>	<b>1204</b>

Pakistan is largest country having greater potential for spate irrigation development for sustained agriculture which now deserve special attention of the provincial and federal government investment for enhanced food security because it is said that horizontal growth in Indus based irrigation is reached to the saturation point. Indus based system does not offer augmented scope for building new barrages and canal through its entire length till sea. In this state of affairs spate irrigation offers wider potential to expand through workable technical solution to replace the century old farmers practices. Currently spate irrigation is functional by local people with indigenous knowledge in Banu, Luki, Tank and Dera Ismail Khan in Khyber Pashtoon Khawa, Dera Ghazi Khan, Rajanpur, and partially at Mianwali in Punjab, Dadu, Jamshoro, Thatta and Larkana and part of Karachi in Sindh. Kachi, Bolan, Sibi, Jhal Magsi, Kech, Awaran, Kharan, Chaghi, Barkhan, Musa Khel, Loralai, Zhob, Dera Bugti, Khuzdar and Lasbella and partially in Kohlu district of Balochistan Province. Spate irrigation is predominantly adept in the western side of the Indus River and almost in entire Balochistan.

Pakistan spate irrigation network established in 2009 and its secretariat is hosted by SPO National Centre Islamabad. Network is part of international network having its main secretariat at Netherland. MetaMeta is lead coordinator for Pakistan, Yemen, Sudan, Eretria and Ethiopia. The network is supported by IFAD, World Bank, EKN, UNW-DPC, INESCO-IHE and FAO with following objectives:

- Familiarize policy makers, implementing agencies (NGOs, government departments, safety net programs), research agencies and funding agencies with development scope, experiences and practical approaches to spate irrigation development
- Document good practices and initiate practical research in spate irrigation
- Disseminate experiences between countries

Activities:

- Undertake pilot activities;
- Develop programs with implementing organizations;
- Preparation and dissemination of guidelines and practical notes, posters and pamphlets.
- Mainstream spate irrigation in higher education

- Organizing trainings
- Documentation and support student research
- Support implementation programs
- Open access information as open access and maintain website

Ongoing Pakistan spate irrigation initiative commenced 2012-2014 and has made significant progress towards the achievement of its project planned targets. Following is the achievement until December 2014.

## 1 STRENGTHENING PARTNERSHIP AND LOCAL AREA NETWORKS

Spate Irrigation network Pakistan is now functional in partnership with SPO (Strengthening Participatory Organization) National Centre Islamabad and full time convener is in place. Regional networks are established at DI Khan, Taunsa Sharif and Dera Ghazi Khan in Khyber Pakhtoonkhwa and Punjab. Two more networks are in process at Sindh and Balochistan Province. There has been introductory meeting of network with the service providing agencies including NGOs and Lines department in the local areas.

Regional network would act as resource management of spate irrigation system and act as a consultative body in planning of development initiatives together will the line department and service providers.



*Figure 2: Presentation for participants of Water Management course - Arid Agriculture University Rawalpindi*

Presentation on spate irrigation is extended to the students and academia of Arid Agriculture University Rawalpindi, University of Engineering and Technology Texla, University of Punjab Lahore, Agriculture College Quetta, Balochistan University of Information Technology and Management Sciences (BUI-TMS), University of Agriculture Faisalabad DG Khan Campus. Political Workers at Taunsa Sharif district DG Khan. During this period approximately 500 contacts were developed with students, farmers, academia, NGOs, Revenue Department official, Official of Irrigation Department in Punjab, Balochistan and Khyberpakhtoonkhawa Provinces were contacted and

sensitized on the importance of spate irrigation through presentation.

### Linkage Development

Pakistan Spate Network has trained a volunteer in spate irrigation during this period. Local area net work established in DI Khan with the active spport of Inter-cooperation and partner NGOs VEER, SPO, PARC and the local communities. The local Spate Irrigation Network in Taunsa Sharif and DG Khan are in place now,

dialogues are made at Bolan and Sibi districts of Balochistan and local CBOs at Johi and Wahi Pandhi in District Dadu in Sindh Province for Regional Network. Network members includes local farmers, engineers, politician and civil society organization who shall represent the interest of local spate irrigation in future planning and implementation and better communication with lines department on services delivery and joint future efforts. During the year 2013. District irrigation departments at DG Khan, Rajanpur and Dera Ismail Khan and entire Balochistan were contacted for the inclusion of spate irrigation in their annual (PSDP) Public Sector Development Plan. The district engineers on irrigation are being followed on it through next communication.

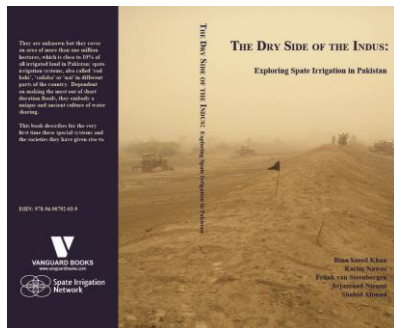
### **Scanning of Water Rights**

14 water rights documents were scanned and uploaded on the spate irrigation web site. Water rights are the documents based on river's defining the water rights of mouzas, and channel and the modus operandi of the system maintenance within the farmers groups. The Local revenue department is overall legal custodian of the water rights in relevant district. In the advent of colonial British rule separate department (rodh Kohi) was established in the districts where spate irrigation was mean of irrigation and agriculture production generally outside of Indus canal system. Since, the spate irrigation is neglected in the mainstream development of the Pakistan, the department of Rodh Kohi is in dismay in many areas.

So the records are kept in poor condition. Since the documents are curtail for future development, so it was realized to digitize it where easily available and conserve them on the spate irrigation website for the longer time. Following water rights documents are now available at the website (<http://spate-irrigation.org/special-projects/water-rights-pakistan/>):

- (1) Rodh Vehoa, (Rodh/River Suri Lundan), Rodh/River Wadoor, Rodh Kaura, Rodh Sewri, Litra and Mithwan, Hamal Wali and Birand in DG Khan district and
- (2) Draban Zam, Chaudwan Zam in DI Khan Khyber Pakhtoonkhawa and
- (3) Chachar Ganda, Qaiser Ganda, Raza and Chandia, Sultan Kot Ganda, Talli Ganda in Sibi Balochistan

## Publication of Book: The Dry Side of the Indus; Exploring Spate Irrigation in Pakistan



Famous book on dry side of the Indus “Exploring Spate Irrigation in Pakistan” was drafted, finalized and send to Vanguard for final publication. The book is now published and available in the local bookshop at Islamabad. Book gives an insight on the scope and prospects and practices of spate irrigation in Pakistan. Similarly, guide lines on spate irrigation are published with the help of FAO and uploaded on the website.

## Translation of Practical Notes and Publicity Material

Pakistan spate irrigation network in association with international spate irrigation secretariat has prepared 11 practical notes, and translated 9 in Urdu, published and uploaded on website and detail is listed below. 5 more practical notes on Sorghum, truffle mushrooms, guar, Pulses (food legumes) and livestock are under translation and will be published soon. Besides the practical note other publicity material like pamphlets, brochure, charts and fliers on spate irrigation were prepared and disseminated at large among the students, line departments, NGOs, farmers and at different workshop and seminars held to highlight the spate irrigation.

- The potential for the Development of Spate Irrigation Development in Pakistan
- Improved Engineering in Spate Irrigation
- Improving Soil Diversion Bunds
- Command Area Improvement and Soil Moisture Conservation in Spate Irrigation
- Oil Seeds Crops for Spate Irrigation Farming in Pakistan
- Pulses (Food Legumes) For Spate Irrigated Farming in Pakistan
- Minor Crops in Spate Irrigation in Pakistan
- Drinking Water Ponds in Spate Irrigation Areas
- Improving Local Grain Storage

## 2. CATALIZING NEW INITIATIVES

Under this work stream a number of initiatives were planned to be facilitated, so as to leverage more interest in spate irrigation using priorities and best practices. Pakistan spate irrigation has completed prepared the Command Area Development Plan of Sanghar, Vehoa project in DG Khan with the consultation of local farmers. The papers were discussed and send to the Provincial Irrigation Department for future expansion in the existing project to harness the maximum benefit out of the project. The papers were informally sent to IFAD, Asian Development for potential investments. The concepts may be

extended to other systems where there has been investment in diversion without similar investments in water distribution and command area development elsewhere in Pakistan.

Introductory workshop has already been held with various NGOs in Balochistan, KPK province and local networks. Training workshop on proposal writings in association with the local area network is in planed at Balochistan and Sindh Province to encourage the local NGOs for inclusion of spate irrigation in their area as rights based approach and further lobbying at Government, intellectual and planner's level for securing more investment and research initiative in the respective province.

### **Bulldozer Restocking for Spate Areas**

Department of Agriculture, government of Khyber Pakhtoonkhwa province was assisted in formulation of PC-I, which is already cleared by the KPK government and submitted to federal government for approval. The meeting between the JICA and KPK officials on replacement of bulldozer was held and indicated the principal support for the replacement of machines. Assisted Punjab government to launch similar project with different approach. As a result the government of Punjab instructed the Agricultural department to auction the non-functional bulldozers and the sale proceeds will be used for developing bulldozer renewal initiative. Proposal is finalized and is in process of approval by the government.

## **3. INTRODUCING INNOVATIONS**

### **Demonstration of Innovative Bank reinforcement.**

This innovation is already under taken by Inter-cooperation (Swiss Development Corporation) funding. The water for Livelihoods project of Inter-cooperation (a Swiss foundation for development) has completed the Design Phase of a training series "on job skill enhancement for improvement of spate or (Rodh Kohi area) Irrigation System". The purpose of trainings was to enhance the technical capacity of the relevant stakeholders to come up with the best economical and sustainable solutions to address the challenges of Rodh Kohi system and to improve local economic conditions in the area. The fourth and final session of (Monitoring & Evaluation) would be carried out after implementation of the model scheme recommended by the trained engineers/ expert and local farmer's network.

Several other innovations were done in engineering such as permeable spillways, combination of road and soil bund to control rodent action. The improvement is proposed to be documented as part of reparation of a Design Manual on spate irrigation. There has been pre and post flood evaluations by joint teams of IC, Irrigation Department, Local spate networks, PARC (Pakistan Agricultural Research Council) VEER and SPO local NOGs technical staff to evaluate the structures and come up with the solution. Gandi Ashiq Khan in DI Khan is selected for improvement.



## Model for Improved Drinking Water Pond



Figure 3: Drinking water at Bhag Town Balochistan

Practical note No.9 prepared and translated for guidance on the maintenance and filling of the drinking water earthen ponds. Safe drinking water will always be a problem in spate irrigation areas. Experiences from different part of Pakistan are being collected. Finally a standard guide lines on cost effective design and budgets, household level treatment methods on drinking water through earthen ponds will be introduced to the NGOs and farmers networks for relatively safe drinking water availability.

## 4. ENGAGING WITH POLICIES

The main purpose of this activity is to ensure that spate irrigation is given rightful place in policies and budgets at provincial level. Pakistan spate Irrigation network has been able for successful inclusion of spate irrigation in (FODP) Friends of Democratic Pakistan, Water Sector Task Force has earmarked USD300 million for the purpose in Pakistan. The report is with planning Commission, Government of Pakistan for final shape up.

Pakistan spate network worked on "Alternative Concepts for Dam Development in Small Rivers". The report is completed in November, 2013. Mainly it discusses off stream or off shore water storage dams or large reservoir in spate irrigation areas to supplement the spate irrigation and over all ground water recharge. In April 2014 National Consultative workshop was held at Islamabad Pakistan and report was presented to provincial water experts from Provincial Irrigation Departments, Government of AJK and academia to evaluate the draft report and to see spate irrigation potential and wide range of alternatives for developing water resources in different valleys of Pakistan and define road on the different aspect of the spate irrigation development. Final version is published under practical note no: 15 and will be available on the spate-irrigation website.

## 5. MAINSTREAMING SPATE IRRIGATION IN HIGHER EDUCATION

Spate irrigation Network Pakistan is engage in dialogue with various Universities of Pakistan for the inclusion of spate irrigation in higher education learning. Three Universities (i) Arid Agriculture University Rawalpindi (2) Gomal University DI Khan and (3) Agriculture College DG Khan are selected for the purpose. After having repeated efforts and financial support of Inter-Cooperation, curricula was prepared, finalized and adopted by the Arid Agriculture University Rawalpindi in December, 2013 through Academic Council.

Curriculum adaptation at BSc level is in progress with other two institutions e.g. Gomel University and Agricultural College DG Khan.

Spate Irrigation prepared a package of 15 taped video lectures, power points and prepared a module on the subject course and shared with Universities. Similarly, 3 lecturers have participated in the short course held at Delft Netherland September, 2013 for further learning on spate irrigation.

The Network has prepared short videos on (i) introduction to spate irrigation (ii) improved soil bunds (iii) electric milk churners (iv) fodder choppers (v) extraction of mustered oil. These videos are available on [www.thewaterchannel.tv](http://www.thewaterchannel.tv). The documentation of this is ongoing consisted of video recording the various aspects in spate irrigation area. These practices and videos have significantly drawn the attention in other countries. Pakistan spate irrigation network has sent 30 electric milk churner to spate irrigation network Sudan.

## 6. PARTNERS



House No. 9, Street No.32,  
MPCHS, E-11/3, Islamabad

Tel: +92-51-2228681-4,  
111-357-111

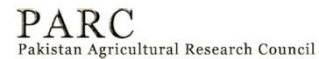
Email: [info@spopk.org](mailto:info@spopk.org)



Intercooperation Pakistan

Tel.: +92 (0) 91-5702450,  
5702451,  
2601038

Email:  
[info@intercooperation.org.pk](mailto:info@intercooperation.org.pk)



Pakistan Agricultural Research  
Council  
G-5, Islamabad

Tel: 051-90733053,  
051-90733058,  
051-9255033