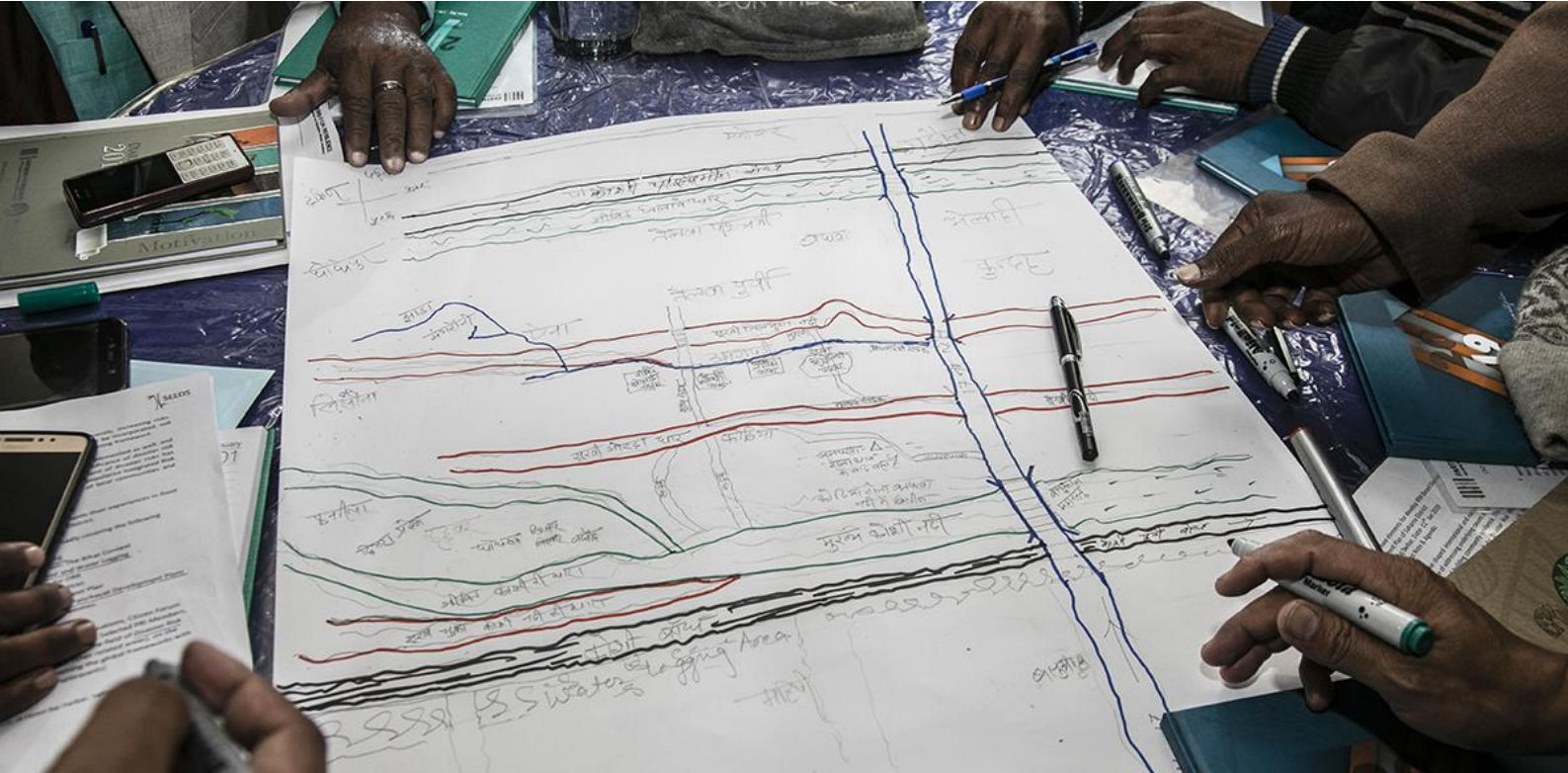




Partners for Resilience Project Saharsa (Bihar)



Transforming risk to a resource

The Partners for Resilience (PfR) programme, has helped us to identify methods to adapt to climate Change. We also received information on disaster risks and preparedness and how to respond effectively. We have identified the risks in the village and are now trying to convert them to a resource. - *Shanti Laxmi Choudhary, Ara Patti Panchayat leader.*

Although Bihar was the first state to reserve 50 percent panchayat seats for women in 2006, patriarchy and caste continue to be a dominant factor that influence governance at the grassroots.

Thirty-four-year-old Shanti Laxmi Choudhary's life took a turn for the better when she was persuaded by her husband to contest for Panchayat elections. In 2016, Shanti Laxmi became the leader of Ara Patti Panchayat (10 villages, 12 wards) in Maheshi Block, Saharsa District in Bihar. Her husband, Akshay Kumar Choudhary, forty-two, holds a PhD in Sociology from Delhi School of Economics and has always wanted to work towards creating better lives for communities living in the village.

'It's my first exposure of living in a village and its been very challenging. Ara Patti Panchayat lies on the lowland separated by the embankment. During monsoons, it is often flooded and inaccessible. Till five years ago, the village was accessible only by boat', says Laxmi.

Most of the people in rural Bihar live in mud houses, made of natural materials such as mud, grass, bamboo, thatch or sticks. These are quite vulnerable to heat waves during peak summer and can easily catch fire. Also, facing perennial floods during monsoon season and therefore a short-lived structure. Shanti has been promoting flagship schemes like Pradhan

Mantri Awas Yojana (PMAY), central government housing initiative and construction of toilets under Swatch Bharat Mission in her village. Around 2700 families have registered for Swatch Bharat Mission, that is around 96 percent of the families living in Ara Patti Panchayat villages.

Sunita feels that it is a challenge to access information on agriculture schemes from the government. Although *Krishi Salahkar* (agriculture adviser) is appointed under Bihar Agriculture Department to provide information on government schemes for agriculture extension services, they are not active at the ground level. There is a gap in the system and corruption does not allow the schemes to be implemented at the grass roots.

‘The Partners for Resilience (PfR) programme, helped us to identify methods to adapt to climate Change. We also received information on disaster risks and preparedness and how to respond effectively. We have identified the risks in the village and are now trying to convert them to a resource’, she further adds.

As a part of Partners for Resilience (PfR) programme, SEEDS has been working in 7 GP’s of Saharsha District, focusing on water mediated risks and promoting multi-sectoral approach for managing disasters. The Integrated Risk Management Approach (IRM) blends Disaster Risk Reduction (DRR), Ecosystem Management and Restoration (EMR) and Climate Change Adaptation (CCA) to address the underlying causes of risk as a means to reduce vulnerability and build community resilience.

In her village, *Tilyuga Dhara*, a water source from Kosi River has been sedimented and blocked due to floods. As a result, the villagers have started constructing houses and are using the land for farming. Laxmi wants to revive the water source again to reduce risk; the water can be channeled for farming. She feels that the water channel is blocked and it will eventually find a different outlet to flow, thus increasing risk for the village.

They are also promoting alternate crops like *makhana* (foxnut) in water logged areas, that is most suitable for crop cultivation and is an aquatic cash crop. This can be implemented with government scheme. Under MGNREGS, new ponds can be developed; can engage in fish farming and access benefits from fishery department schemes.



The farmers in the village are engaged in traditional farming, growing cereal crops like paddy, wheat, maize and *Moong*. This does not fetch them sufficient money. Cash crops like sunflower can be a good choice for farmers due to its wider adaptability, high yield potential, shorter duration and profitability. Earlier, jute cultivation was popular in the area but it is no longer practiced. The PfR programme is trying to bring in good practices that is suitable for the local ecosystem. Fruit are also a better option. One of the challenges for the farmers is that they do not have adequate information and they have not been guided and motivated to explore new avenues of livelihood.’ concludes Laxmi.

The program influences are evident. Growing trees on the roadside can help prevent the roads and infrastructure damage during floods. The bridges and culverts are not planned and constructed appropriately as they cut the road due to incessant flow of water during floods. Trees are not only suitable for environment but also a source of livelihood. Laxmi Choudhary has taken all these factors into consideration while submitting Gram Panchayat Development Plan (GPDP).



Early Warning System

‘In 1987, our village was inundated by floods. We were forced to flee our home and the whole village was evacuated, people and animals rescued on boats,’ says Dev Kumar Bind recalling the shocking experience of childhood. Since then, Dev Kumar has grown up witnessing recurring floods in his village Kothiya in Maheshi Block of Saharsha district in Bihar. The floods remain an annual threat.

Saharsa district and its surrounding areas occupy a flat alluvial plain forming part of the Kosi river basin. Floods occurs almost annually, causing loss of lives, livelihoods, infrastructure and property.

‘We never had any information on the rising water level during monsoons and hence we could never be prepared. When the water entered the homes, we then knew that in 3-4 hours the village is going to be flooded,’ explains Dev Kumar, resident of Kothiya village. Due to lack of early warning and preparedness measures, the communities habited along river Kosi would often wait for the floodwater to enter the village before they rushed out for safety.

Under Partner for Resilience (PFR) programme, SEEDS facilitated to setup community based early warning system in ward number 2 of Kothiya Village, situated 100 meters along river

Kosi. Members from the IRM Committee (includes community leaders, PRI members and ward members) mobilised funds to set up River Gauge. 19 task force members were oriented on the Early Warning System in June 2018.

The Early Warning System comprise of river gauge set up against a bamboo pole to hold flags. The three different colour flag warnings depict different levels during emergency. The white flag (level 01 at 120 cm water level mark) informs the community to be on alert. The yellow flag (level 02 at 130 cm water level mark) indicates that the community should get ready to evacuate. The red flag (level 03 at 150 cm water level mark) is the final warning for immediate evacuation. The red alert is broadcasted by blowing the bugle by another task force member, a priest from the nearby temple.

On daily basis, SEEDS staff obtains information of the river water level in Chatara, Nepal from the Department of Hydrology and Meteorology website in real-time and share it with the task force member in Kothiya. The task force member monitors the river gauge 4 times a day - 6 am, 10 am, 2 pm and 6 pm and maintains daily record in River Gauge Register. This information is shared daily to all the members of IRM committee in 7 GPs, where SEEDS is working presently.

The early warning system provides 22 hours lead time for vulnerable communities to prepare and respond to approaching floods. Over 36 villages in Maheshi Block benefited from the early warning system in 2018. The information also benefited the farmers to plan well in advance for paddy cultivation. 'Because of the river gauge, we benefited a lot. We naturally process the information for our harvest and soil preparation. This year we had a good harvest; preparation of soil, sowing and adding manure and fertilizers was all in accordance to the information received,' says Mohan with a smile.

PfR's strategic plan implementation in India is focussed on water mediated risks which constitute a majority of disasters in the country and, where application of Intergrated Risk Management can help leverage change by connecting actions across various development and conservation sectors. The early warning system in Saharsa is a simple example of community based risk management that can protect both lives and livelihoods in recurring flood scenario.



Sustainable livelihood

Agriculture in the state of Bihar, India is primarily dependent on monsoons. Farming is the main source of income for 90 percent of the population living in rural areas. Changes in seasonal patterns i.e very high temperatures during summers, reduced days of rainfall and shorter winters have significantly affected crop yield and have disturbed the cropping pattern that farmers have been engaged in for several years.

‘Due to poor rainfall this year, the land was dry and paddy harvest was significantly poor. As a result, more farmers were keen to grow wheat during Rabi season. This year we are expecting good wheat harvest as compare to last year,’ says Shashikant Yadav from Sirbar Virbar Panchayat in Saharsa District.

SEEDS through PfR programme is working in 7 GP’s of Mahishi block in Saharsa district, located in the northern plains of Bihar. One of the goals of the program is to enhance community capacity through participatory risk assessment tools, understand the vulnerability due to climate change and help implement effective and sustainable adaptation.

With the facilitation of SEEDS, 7 GP’s have developed Risk and Resource Map, Stakeholder Map and Seasonal Calendar to assess climate related risks and vulnerabilities in general and livelihoods in particular. Seasonal Calendar tracks the seasonal changes, climate-related hazards, identifying time for working with crops, primarily to plot seasonal farming activities.

The farmers in Sirbar Virbar Panchayat have now developed a better understanding of the risks and vulnerabilities in their area, taking in view the larger perspective of landscape and long-term risk analysis.

‘The change in the climate has substantially affected paddy production. For long, rice has been the main crop of the year and a source of income. Now the whole cycle is disturbed. Earlier we used to follow the broadcast method of scattering paddy seeds manually over a large area

or in the entire field. This is no longer practiced because the land is often waterlogged and does not allow the seeds to sprout. Sometimes due to incessant rains, the rice fields are flooded and we incur losses; and sometimes we face drought, that also affects our yield. Because of that, the farmers are now paying more attention to growing wheat. The wheat harvest can also be affected if the temperature rises. From the Seasonal Calendar we can clearly see that the winters are becoming short. Even though it is the month of January, there is so much moisture in the soil, that it will not fetch a good yield,” says Shivli Nomani, a farmer from Gamroh village, Sirbar Virbar Panchayat.



“This is also one of the reasons for huge influx of migration from the villages. If we are solely dependent on agriculture, we will not be able to sustain”, he further adds.

In the coming years, the farmers are anticipating that a large part of agricultural land will be converted to permanent waterlogged areas in their Panchayat. They are now trying alternate crops like *Makhana* (foxnuts) or *Singhara* (water chestnut), that are suitable for waterlogged area. Few farmers are also keen to start fish farming but as of now they are not totally dependent on these alternate means of livelihood. The challenges for the farmers is to access government schemes that promotes alternate livelihood initiatives.

One of the reasons for health issues in the village is high iron content in water and use of chemicals fertilizers in farming. Earlier cow dung was used as a fertilizer for farming. Over the years, insufficient and poor nutritive fodder due to excessive moisture in the land has resulted in decline in livestock. Finding veterinarians is also a challenge in the village, says Narayan Jha.

Under the programme, the farmers have been motivated to use Jaivik (organic) fertilizer and set up Vermicompost unit. The agriculture department provides 40 percent subsidy to the farmers engaged in vermicomposting. Around 25 farmers from Sirbar Virbar Panchayat have received training in Vermicompost in July 2018, Shashikant Yadav being one of them.



Shashikant owns two and a half acre of land. He grows cabbage using vermicompost. Water hyacinths commonly found in the water logged area is also used to prepare Vericompost, thus has converted the risk to a resource. Shashikant feels that the compost is not only organic, he has also been able to save money from buying fertilizers like potash and urea.

Many like Shashikant are gradually feeling the need to adapt to changing circumstances and SEEDS initiative further reinforces their thoughts. The PFR programme not only helps community internalize the need to adapt but also creates space for utilizing local resource and wisdom for improving livelihoods.



Effective Planning for Future

Bihar is India's most flood-prone State, with 76% of the population in the North Bihar living under the recurring threat of flood devastation. Development induced risks like unplanned construction, reclamation of wetlands and change in land use patterns in the rural areas have further intensified flood risks and livelihood vulnerability.

SEEDS under the PfR programme, is working in 7 GP's of Maheshi Block in Saharsa district, promoting Integrated Risk Management (IRM) approach for managing disasters with focus on Disaster Risk Reduction (DRR), Ecosystem Management and Restoration(EMR) and Climate Change Adaptatio (CCA). The programme involves building capacity of CSO's on Integrated Risk Management, advocacy of the same at the District level and mainstreaming IRM approach in Panchayat Development Plans and District disaster management plans.

Sirbar Virbar Gram Panchayat lies in two different geographical areas divided by Kosi embankment. Around 2000 acre of land lies inside the embankment area, thus severely affected by floods and the remaining 3000 acres falls in a low lying area more prone to waterlogging from seepage from the other side. The risks and vulnerabilities of both the areas are different. There are 14 wards in 6 villages of Sirbar Virbar Gram Panchayat, with a population of 11, 576 (as per 2011 census).

At Sirbar Virbar, Hazard Vulnerability and Capacity Assessment (HVCA) tool has been used to gather information on risks and vulnerabilities at the community level and identify available resources to cope during disasters. With the facilitation of SEEDS, 7 GP's have developed Risk and Resource Map, Stakeholder Map and Seasonal Calendar. This exercise has helped the community and particularly PRI members to plan for Gram Panchayat Development Plan (GPDP) to reduce further risks and develop the resources effectively.

Nitish Kumar (Mukhiya representative) of Sirbar Virbar Gram Panchayat has been associated with the PfR project since 2017. Nitish feels that a major cause of increasing health issues is high iron content in water, affecting both human life and the livestock. With the guidance and facilitation of SEEDS staff, 2 water filters have been installed inside the Kosi embankment area and 1 outside. In a span of one year, 70 percent of toilets have been constructed in the village under Swatch Bharat Mission.

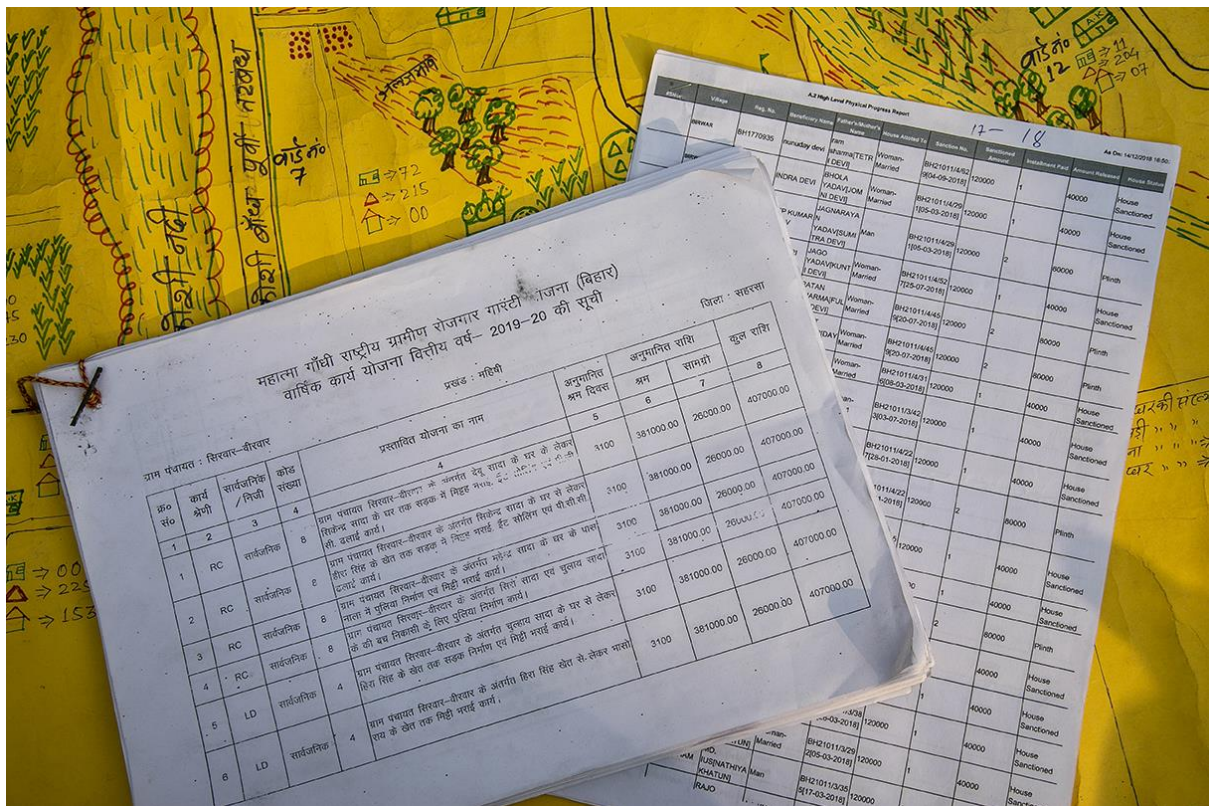
The programme influences are evident, the GPDP developed have a comprehensive risk management approach. 'The 5 Anganwadi's located inside Kosi embankment are thatched shed structures and we have proposed to build new Anganwadi Centers. A lot of agriculture land is slowly being cut down from both sides by the river and we want to plant trees under MGNREGS to prevent soil erosion,' says Nitish.

Around 4-5 percent farmers in the gram panchayat own agricultural land. Some practice farming on leased land. Majority of the male-population have migrated and are engaged as daily wage labour. The low lying area outside the Kosi embankment has major issue of water seepage from the river. Around 2200 acres of land is water logged and inept for agriculture. The dwelling around the water logged area mainly comprise of BPL families living in mud and thatched roof. Nitish has proposed to raise the height of habited area with soil and mud to create safe space for the families.



There is also a plan to construct drainage to channel dirty water from flowing in the river and construct bridge for easy accessibility during monsoons. Small culverts have been put in the plan, for smooth flow of water.

‘Livestock can be an alternate source of income for people in the village but we do not have appropriate space to keep the animals. As a result, livestock population is slowly declining,’ explains Nitish. He has proposed to develop animal sheds with proper space for fodder. According to him, it is challenging to develop ponds in the water logged areas. It will incur cost to bring mud from outside. However, *Makhana* (fox nut) farming is most suitable in that area. Farmers from the GP have received training on Vermicompost and Nitish is promoting it in the village. He has planned for developing Vermicompost units in the village to revive soil fertility and promote organic farming.



In India, gram panchayats have a significant role to play in effective and efficient implementation of flagship schemes for rural development in India. Gram Panchayats have been mandated to prepare a comprehensive Gram Panchayat Development Plan (GPDP) through participatory process, planning at Gram Sabha level through convergence between Panchayati Raj institutions and concerned departments of the State.

Although It has been challenging for Nitish to develop a comprehensive GPDP, he feels that Hazard Vulnerability and Capacity Assessment has immensely helped to plan development activities keeping in mind existing vulnerabilities and how they can be best managed with the given resources.

Local Champions



Thirty-eight-year-old Pum Pum Devi needs no introduction in Lakhni village (Panchayat : Telhar). An excellent orator and a proactive community leader, Pum Pum Devi holds meetings with the community in several villages to advocate for the protection of ecosystem. She feels that planting trees around the pond can reduce flooding. The Kosi-Gandak floodplains is considered a volatile floodplain, an array of rivers, originating from the Himalayas flow through the floodplains to eventually join Ganga river. Kosi is the main river source of the district and its basin comprises of rich alluvial soil, the river is known for shifting its course often the cause of river erosion and floods. Lakhni village have faced the one of worst impacts of floods due to this course change. **‘I often think how we will save ourselves from floods. For this issue, I have gone to several villages, to wake them up . . .’ - Pum Pum Devi , Task Force member**

Like Pum Pum there are several individuals at Mahishi Block who understands the local eco system and are working to integrate a healthy wetland management. Systematic channelization of the rivers by means of embankments along with unplanned construction across the drainage network have completely altered the natural water flow regimes of the floodplains. Waterlogging has emerged as the main disaster risk of the landscape. Alternately the loss of wetlands has increased the drought risks, as their water retention capacity and resultant service of recharging the ground water reserves has been lost as well.



Fifty-five year old Narayan Mukhiya from Narwar panchayat is the secretary of Mahishi Block Cooperation Fisheries Association (*Matsya jivi Sahoyog Samiti*). The association gets wetlands on lease from the government and further lease out to various groups of fishermen and farmers for fish farming and makhana (fox nut) cultivation. The association holds around 2000 acres of wetlands.

According to Narayan Mukhiya, 'Due to the change in the weather it is challenging for farmers to engage in Makhana cultivation. The right time for sowing seeds is from Jan to Feb 15. It is then ready for transplantation between Feb 15 to March 15. If transplanted on time, the production is 10-12 quintal per acre, else, it is reduced to 6-8 quintal per acre. '

Makhana plant grows in fallow wetlands of standing shallow water of about 2.5 m depth. In the past decade, the wetlands are slowly drying during winter season. The temperature is rising and the water table has gone down. As a result, farmers are using bore-well to fill up the dried wetlands for Makhana cultivation, resulting in a cost intensive process.



A good Makhana harvest depends on timely rains from a period of May to June 15, without that, the production is reduced to 50 percent. And in case of floods, the entire hard labour is

lost. The issues do not end here. Due to lack of a direct marketing avenues for Makhana, it's the middlemen who makes huge profits.

'This year the weather is more suitable for fish farming as the temperature has already risen in winters,' he further adds.

Narayan Mukhiya has been associated with the PfR project for 5 months. Having attended the meetings, he has been encouraged and motivated to access benefits from government schemes. For the first time, Narayan took the initiative to apply for 13 new wetlands from Maheshi Block Revenue Department and has succeeded in the same. He has also facilitated 433 fishermen to access central government accident insurance scheme- Pradhan Mantri Sureksha Bima Yojna.



Narayan feels that ever since meshed nets have been introduced, the fish production has significantly reduced. Fishing with fine meshed nets and traps does not allowing sufficient time for young fish to grow. Narayan Mukhiya is sensitizing the fishing community to use cotton nets as used traditionally and revive traditional techniques better suitable for fishing.

Three months ago, Narayan Mukhiya applied for a new ponds construction scheme (artificial wetland), and proudly says that his association is the only one in Saharsa District to have been successful. Narayan Mukhiya is concerned about the degraded condition of wetlands and emphasizes on conservation of wetlands. He has written an application to the District Fisheries department for the same.

Before intervention of PfR programme, we never tried to access schemes and entitlements. We always felt that it will be a futile process. Narayan says with a big smile.



Narayan's concern and efforts are often complimented by Jai Prakash who is a Nursery supervisor appointed by Forest Department. He identifies farmers who own land and motivates them to plant trees under Krishi Vaniki Yojna. Krishi Vaniki Yojna is a Bihar state government scheme that promotes agroforestry to local farmers. The main objective of the scheme is to strengthen farmers economically and reduce ecological balance causing floods and droughts.



Poplar tree are provided to farmers at no cost. Farmers are then rewarded Rs 10, Rs 10 and Rs 15 for each surviving tree, respectively, at the end of the first, second and third years. According to Jai Prakash, 125 poplar trees can be planted in 1 acre. They mature in 6-8 years,

worth Rs 3000 per tree. This generates an additional income for the farmers. However, at the moment, there is no market for selling Poplar. E-Forest Mandi is the platform developed by the Bihar Environment and Forest Department to facilitate farmers to sell timber related products directly.

'In Jan we are promote plantation of poplar trees. From Feb to Aug, we promote other species like Mahogany, Eucalyptus, Kadam and Acacia under different scheme,' says Jai Prakash.

Earlier Jai Prakash's work was confined to 2 panchayats. It was not possible for him to visit other Panchayats single-handed. As a task force member under the PFR programme, he has been able to reach out to over 22 villages. Jai Prakash often disseminates information on forest schemes at the panchayat, block and district level, wherever PfR meetings are held.

Pum Pum, Narayan Mukhiya and Jai Prakash are all task force members who are eventually complementing the existing disaster risk reduction measures by the district administration by enhancing community capacity to sustainably manage its wetlands, integrate climate risks within village level and secure their own lives and livelihoods.

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