Building a resilient ecosystem

in Buddhi village, Kathua, Jammu and Kashmir

August 2017

INTER-CONNECTED RISKS IN KATHUA

Kathua district lies in the south-west of Jammu & Kashmir. After a comprehensive assessment of four villages - Buddhi, Mearth, Nanan and Nagrota – recurring sustainability and resilience issues came to the fore. As one of the largest villages in the district, Buddhi was chosen as a model village.

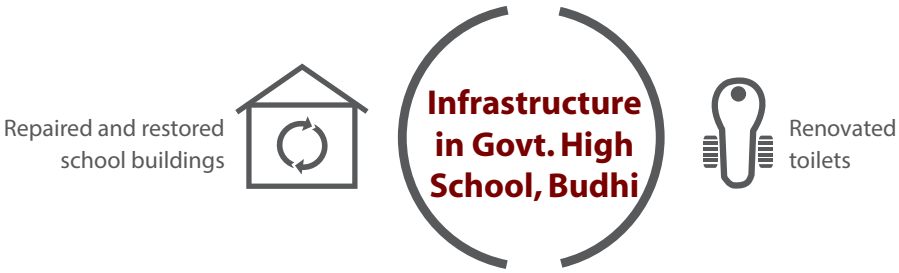
Physical development such as the repair of schools, water resource management and sanitation was of priority. At the same time, community mobilisation and awareness around environmental sustainability issues was extremely low.

Keeping these inter-connected risks in mind, a multi-pronged initiative was conceived. At its core was the creation of a safer learning environment through repair and restoration of school buildings and toilets. Water harvesting mechanisms were planned to showcase sustainable water management techniques. Using a local government school as the fulcrum allowed for the demonstration of these techniques to the larger community, keeping children at the centre. At the same time, a larger awareness, mobilisation and trust building component. was planned. This engagement with the wider community helped increase knowledge on environmental sustainability.

Buddhi village risks

- Poor condition of Govt. schools
- Improper hygiene practices
- Lack of awareness on sustainability
- Inadequate water management

CREATING A SAFER LEARNING ENVIRONMENT THROUGH SCHOOL INFRASTRUCTURE



Govt. High School, Buddhi was in poor condition. With little maintenance over the years, seepage and water damage had badly affected the buildings. Toilets were broken or inaccessible, with open urination being a common occurrence. 517 students of this school were studying in a suboptimal learning environment.

The intervention in the school decided to focus on two key aspects to create a safer learning environment; repairing and restoring the school buildings and renovating the toilets.

A monitoring committee was formed for overall supervision of the school initiative, with representatives including the school principal and teachers, local leaders and active community members. This not only helped in monitoring the work progress and quality but also in maintaining transparency. With Buddhi being a small village, the monitoring committee was also instrumental in advising on qualified local contractors and identifying local vendors as per construction material needs!

REPAIRING AND RESTORING SCHOOL BUILDINGS

> "The strength of the school depends on its infrastructure. This repair was a crucial initiative. The students feel happy when entering the classrooms now!"
>
> – Naresh Kumar Sharma, Principal

In-depth technical assessments of the school building revealed greater damage than envisaged. The school buildings were largely load bearing structures built with brick masonry in mud mortar with cement plaster on the surface. The plaster was hollow as it had given way from the walls.

The school premises had six blocks which accommodated a principal room, administration and staffrooms, labs, library and classrooms. The restoration covered all six blocks of the school (named A-F for easy identification).

Aside from the external and internal wall plastering, roof repair and waterproofing that was common to almost the blocks, some had some unique challenges or interventions that were added.

Block F had a number of trees growing through the walls of the building. One by one, these roots had to be painstakingly removed wherever possible. The corners were then strengthened with steel reinforcements and wire mesh jacketing.

In Block B which houses labs, vitrified tiling was installed in the chemistry lab. A roof railing was also installed. This was critical from a safety viewpoint as classes were conducted on this open terrace, especially in winters.

Overcoming challenges

Repair and restoration of the school buildings was no easy task. Considering the condition and materials of the building, techniques had to be carefully adopted. Chief among these was waterproofing the roof, the main source of dampness and deterioration of the building. With the concept of waterproofing itself being new to the community, skilled workforce was hard to come by and technical specifications and designs had to be carefully crafted. Extreme weather conditions exacerbated the challenge as waterproofing ideally requires constant temperatures throughout the day.

Since construction couldn't be carried out while children studied, the work was done after school hours and late into the evening. Extended power cuts added to this challenge, not just for the lights but to access water supply for cement curing and additive chemicals. Many times, water was carried manually which was a time-taking and tiring process.

Facets of restoration

Roof cleaning, repair and waterproofing

External wall plaster

Internal wall plaster

Strengthening of wall junctions and corners with steel reinforcements, wire mesh jacketing and polymerized cement plaster

Strengthening of plinth protection

Repair of cement flooring

Re-tiling (in science labs)

RCC beam roof tie

Installation of roof railing

Construction of rainwater harvesting tank

Repair of doors and windows

Painting and finishing


अच्छा है जो हौंसले से आगे बढ़े

Repair that aids a sense of well-being

The repair and restoration of the school buildings goes beyond physical safety of the structure alone, but can help promote overall well-being of the children.

The school had no place for students to sit and relax other than classrooms. This gave rise to landscaping and external development. Trees and flowers were planted. Small sitting spaces were created. The entire school was brightened up with paint and graphics.

Block E, among the oldest in the school, provided an opportunity to take this idea even further for it required re-erection of some external walls. Due to settlement in the foundation, the external wall had begun tilting outward. The timber frame of the CGI roof was broken and parts eaten away by termites. The external wall was therefore redone in cement masonry with an RCC beam foundation.

As these walls were re-erected one by one, transformational modifications were made to the design. New window openings and brick jallis (screens) were artfully incorporated. The roof was re-designed with a one-way slope that allows for better air circulation and reduces build-up of heat in the classroom.

These measures have limited the need for artificial lighting and created airy, comfortable classrooms even during hot summers!

RENOVATING TOILETS

When children, especially girls, have unimpeded access to a clean and functional toilet, it actually changes their experience at school.

The school had four toilet blocks which were badly damaged and had no access to water. Initial assessments showed that the students would actually opt for open urination. All four were refurbished, but two required intensive work.

The open air toilet block was completely renovated. New urinals and wash basins were installed. The addition of a fibre glass roof kept openness while offering protection. Wall ties and plumbing work were undertaken and the overhead water tank was also repaired.

The two toilet units for girls were in the worst state of all four blocks. Here the entire septic tank and overhead water tank was cleaned and restored. The roof was also repaired and waterproofed. Water basins completed the process.

Through the toiler renovation, sustainability measures were kept in mind. The tank with water from the rainwater harvesting system was connected to the toilet blocks , allowing for a constant supply. Waste water from the wash basins flows into a soak pit, which acts as a recharge pit for the ground water.

Strikingly painted in pink and blue, the toilets look bright and clean, giving children a new perspective to sanitation at school!

HARVESTING THE RAIN AND THE POND

Kathua falls into the Kandi region, where despite being a water surplus district, water shortages plague the community. Not only are water management processes inadequate, but deep water levels, reduced seasonal and long-term discharge and poor water quality add to the problem.

The case was no different in the school, which had scarce access to water even for secondary purposes. The installation of the rainwater harvesting mechanism was an opportunity to help resolve this problem, while also showcasing environmentally sustainable practices to the larger community.

However, since rain in the area is generally limited to 2-3 months and percolation in the school premises is limited, water supply would quickly dry up. So the harvesting system was designed to ensure that it is fed by dual sources – both rain and the local pond –to make it functional all-year round.

Rainwater pipes were installed on the roof of Block B and additional pipes connected to the pond. The water passes through a filter comprising layers of stone gravel, charcoal and sand. The filtered water is then collected in an underground storage tank with a capacity of 10,000 litres. The tank itself is designed with a skylight, using solar light purification techniques to seize growth of any insects, mosquitoes or algae.

Finally, the tank is connected to the toilet block, ensuring that water shortage in the toilets no longer dissuades students from using the facilities!

Rain water pipe connection from roof to filter

Slow sand filter under construction

Slow sand filter

Under ground water storage tank

In response to the clear need of the school community, a drinking water facility was also constructed. This involved repairing the unhygienic water sourcing area (on the outer wall of school), a proper filtration system and construction of a drinking water area with basins. The waste water from the drinking areas was also linked to the newly built recharge pit.

Once a key water source for the community, the pond has been ignored over the years, leading to polluted water and algae formation.
Its linkage with the harvesting system therefore serves a longer-term goal, enabling the pond water to be re-used and cleansed over time.

REACHING OUT TO THE COMMUNITY ON ENVIRONMENTAL SUSTAINABILITY

The involvement of the broader community in managing available resources was negligible. Along with the structural interventions, attitudinal shifts were clearly essential to sustain any intervention. Promoting participation and ownership could help reduce dependence on the local government and inculcate a habit of managing community assets themselves.

A total of 40 workshops were therefore organised, covering issues of water, sanitation, hygiene, waste management, disaster risk reduction measures and environmental sustainability.

Disaster preparedness workshops with school children focused on dos and don'ts for earthquakes, basics of first aid and search & rescue techniques. The children themselves carried out street plays in multiple locations around the village to generate broader awareness. The trained senior children also passed the knowledge on to students in class 8 -10, helping the school retain the techniques within future batches.

Sessions with school teachers and administration included in-depth information on various facets such as inculcating hygiene practices into their routines, maintaining cleanliness of water sources, curtailing open defecation and carrying out solid waste management at the school level.

Discussions with local and district administration, particularly officials of the Block Development Office and the Public Health Engineering Department, have sensitised them on environmental sustainability. Avenues were talked about to tap the resources made available for construction of sanitation units at the community level. Ways are being sought to leverage the existing project and policies of the district administration to clear the pond and work out a permanent solution for water shortage in the school through it.

A street play conducted by a children's group addressing key issues in the village.

INCULCATING SAFE SANITATION AND HYGIENE PRACTICES

Children are often the best vehicles to bring about larger change and the awareness workshops made them a key stakeholder. Children's groups were formed to push WASH activities in the school and also take it forward to their neighborhoods. From proper steps of hand washing to healthy eating habits, the workshops brought in new learning. It has actually triggered visible transformation in attitudes as well. Many children now hesitate to defecate in the open and teachers report changed behaviour, especially on cleanliness and hand washing!

Integrating positive water, sanitation and hygiene lessons at ICDS Anganwadi centres was an important step to improve the health of pregnant and nursing mothers and pre-school children. The frontline workers now make sure to discuss these issues with families that they visit to implement government- run schemes.

Living in a conservative society, the women rarely discussed sanitation and water problems, though they dealt with them every day. These workshops presented an outlet to talk openly about the issues in the area and to understand solutions. For example, due to water shortages, a majority of women would store water for months at home without treatment. The use of water disinfectants was therefore inculcated. Among other points of awareness were the issues of open defecation, dumping of solid waste and manmade water pollutants in the river during festivals.

"Women here already understand the importance of water. All work revolves around it! These WASH exercises have shown how to use it more safely."

– Neha Budiyal, Woman leader and principal, Rachpal Memorial Convent School

The workshops also touched upon available government schemes and methods to acquire funds to build private toilets. Many of the women now actually take it upon themselves to informally monitor littering and cleanliness in their area.

Combined together, the various strands of the awareness programme have helped spark consciousness of hygiene, sanitation, environmental sustainability and safety in the larger community!

Handing over ceremony

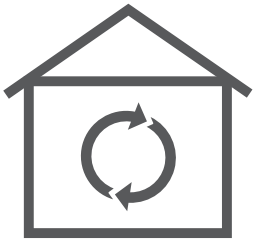
A repaired and restored Govt. Higher Secondary School, Buddhi was handed over to the school authorities on 24th May, 2017. Present on the occasion were Mr. Shyamal Mukherjee Chairman, PwC India and Mr.Jaivir Singh, Vice President, PwC India Foundation. The event was attended by over 150 people including the school administration, teachers and students, District officials, SMC and monitoring committee, parents, community members and SEEDS staff.

REACHING OUT...

580
students at Govt. High School Buddhi have a safer learning environment

21
Government officials sensitised on sustainability measures

466
students made aware of disaster preparedness steps



All
3805
people in Buddhi village have indirectly benefitted from a more resilient ecosystem

1315
people made aware of water, sanitation and hygiene practices

AND SOWING SEEDS OF INSPIRATION

- The renovated Govt. High School has attracted interest from families in the community, even resulting in new enrolments for this new year.
- Repair and renovation of the school building has inspired school communities to set high quality standards, with other schools in the area now asking for similar interventions.
- The approach to the work, differentiated from typical 'contracting', has helped transfer knowledge, skills and techniques on good construction practices and repair techniques.
- Waterproofing, a previously alien concept, is now generating more interest. The project contractor has even become a certified agent for the leading waterproofing brand in the area.
- The awareness initiatives and small sustainability measures incorporated into every part of the programme (ground water recharge from waste water, rainwater used in toilets, long-term cleaning of the pond through the filtration system) have sparked a broader resilience culture within the community.

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Photographs: Aakash Vishwakarma, SEEDS Team, Siddharth Behl

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