Evidenced transformations: using data to demonstrate improvement in school-based access to water, sanitation and hygiene in Uttar Pradesh, India

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ABSTRACT

The availability and access to water, sanitation and hygiene (WASH) facilities in schools have been associated with enhanced learning and nutritional outcomes among children in India and elsewhere. However, there is limited documentation of successful scaled-up models to improve WASH facilities in schools. This paper describes an innovative 'transformation campaign' to strengthen WASH facilities in government-run elementary schools in Uttar Pradesh, the most populous state in India. The campaign was launched in 2018 followed by an online monitoring portal using data-informed feedback and role modeling in 2020. A comprehensive baseline assessment was conducted in 114,790 government elementary schools in Uttar Pradesh, during which school focal persons ranked their schools' access to WASH services against the set benchmarks. Concurrently, high-ranking schools were established as 'learning labs' for neighboring schools and were provided with on-site capacity building opportunities. More than 150,000 teachers were systematically engaged through regular virtual training and automated calls that tracked progress, all parts of a centralized online portal. This champion-led transformation of school (CLTS) approach was adopted by the government to recognize best practices supported by students and teachers. Initiatives of teachers and village-elected representatives (*Gram Pradhan*), who were identified as 'champions', were recognized and disseminated to build an enabling environment that will sustain access and practices. As of July 2021, 65.8% of the assessed schools across 75 districts have improved their basic infrastructure through repairing/retrofitting defunct facilities and construction of new ones as per the gaps identified. They become 'WASH compliant' and leveraged around INR 45.71 billion of public financing from multiple sources in the last 3–4 years. Now, the state is rolling out a similar transformation campaign for 188,997 pre-school centers that will cover 5.6 million children between the ages of 3 and 6 years. The implementation process, challenges and learnings of this campaign can be used to formulate strategies and design scaled-up interventions to improve WASH facilities in schools.

Key words: evidence, hygiene, sanitation, schools, transformations, water

HIGHLIGHT

- WASH facilities in schools are critical for learning achievements for children and creating child-friendly environments in schools. Governments can achieve this at scale even in the challenging context through partnerships, convergence, leveraging resources, capacity building and a comprehensive online monitoring system.
- The innovative approach of using ICT-based tools to generate evidence, facilitate planning and monitor quality of implementation, along with a strong enabling environment is critical for transformation of water, sanitation and hygiene services in the schools.

INTRODUCTION

Children are entitled to the human rights of sanitation, safe water, good health and quality education (United Nations 1989). In the Indian context, the right to water is an integral part of Article 21 (right to life) of the Indian constitution wherein safe and clean drinking water as well as sanitation have been recognized as basic human rights necessary for the enjoyment of life (Wahi 2022). The Right of Children to Free and Compulsory Education Act has set norms and standards for adequate and quality water, sanitation and hygiene (WASH) facilities in schools.

In order to comply with the constitutional mandate, the Government of India has expressed its commitment to improve WASH facilities in government-run elementary schools through various programs. However, access to adequate WASH facilities in government-run elementary schools continues to be a challenge in Uttar Pradesh, which has more than 130,000 government elementary schools with an enrollment of more than 15 million children (U-DISE, 2019–2020, Ministry of Education). A number of research studies suggest that availability and access to WASH facilities, together with child-friendly classrooms and campus ambience, are essential for creating an enabling environment – a learning ecosystem for both children and teachers. In India, the availability of gender-specific toilets in schools can substantially catalyze enrollment, particularly among girls (Adukia 2017). Moreover, improved water and sanitation facilities in school have led to a marked reduction in diarrheal and other gastro-intestinal diseases (Jasper Le & Bartram 2012; McMichael 2019).

This paper dwells on a school transformation campaign known as 'Operation Vidyalaya Kayakalp' (OVK) launched in 2018 in the state of Uttar Pradesh. The campaign focuses on ensuring availability of adequate and safe WASH facilities in government-run elementary schools. This paper examines the most outstanding results achieved by the OVK campaign and reflects upon the gaps, challenges and lessons learned during the process.

WASH *VIS-À-VIS* EDUCATION AND NUTRITION

The commonplace experience remains that WASH services in schools are necessary for ensuring unhindered participation of everyone in the conduct of classrooms and teaching–learning processes particularly, for girls and female teachers. The necessity of WASH facilities such as drinking water, sanitation, hand washing station, incinerator, for instance, is easy to identify. Not so very long ago, when these basic facilities were not common, children would leave the class when they needed water to drink or wash, many times not returning. The situation was even more challenging for girls due to lack of facilities for menstrual hygiene management in the schools. Several studies have shown that poor WASH facilities in schools is a major obstacle in the achievement of good-quality education (Alexander *et al.* 2014; Fuller *et al.* 2015; Vishnupriya *et al.* 2015). The need of hand washing facilities was not felt with equal intensity earlier. But, of late, children are beginning to understand the importance of hand washing with soap after the construction of child-friendly group hand washing stations in their schools. For adequate WASH facilities in schools, there should be:

- A separate toilet complex for girls and boys in each school with one toilet seat and three urinals per 80 students.
- One toilet for children with special needs.
- At least 10–12 taps in the ratio of 1 tap per 10–12 children for group hand washing stations.
- Running water supply in toilets and hand washing stations.
- More than 1.5 L of safe/treated drinking water per child per day.
- Water quality tested twice a year (before and after monsoon).

Nutrition is largely seen as an outcome of WASH, in addition to other factors. Safe environment ensured by WASH practices can contribute explicitly to generate awareness and, subsequently, develop informed behavior change among school-going children, thus having a direct bearing on their nutritional status (Toetzeke *et al.* 2017). Therefore, a nutrient-rich diet along with WASH can drastically improve the overall health of children in India. These have become more critical during the COVID pandemic as well.

Dean Spears (2012) found that the height of children in India is directly linked to availability of sanitation and hygiene at home and in their neighborhood, comprising the school as well. He further argues that open defecation is one of the key reasons for stunting. However, on the contrary, popular perception holds that only poor quality and quantity of food are important determinants of undernutrition among children. Robert Chambers with Medeazza (2013) takes the argument further by referring to the term 'Asian Enigma' which is the persistence of high levels of undernutrition among children despite an adequate amount of food. Ramalingaswami *et al.* (1996) note that poor living environment and meagre access to safe drinking water and sanitation together constitute the 'poverty syndrome' that leads to undernutrition among children as well as women.

UNICEF'S RENDEZVOUS WITH WASH IN SCHOOLS (WINS)

UNICEF's engagement with WASH in schools builds on the commitment to ensure a clean and safe environment for all children. It considers access to clean water, basic sanitation and good hygiene practices as one of the fundamental rights of every child, which keeps them thriving and give them a healthier start in life right from the beginning of their schooling years. WASH in schools is also reflected in the Sustainable Development Goal (SDG-6), which aims to achieve access to adequate and equitable sanitation and hygiene as well as universal and equitable access to safe and affordable drinking water for all by 2030. As children spend a significant portion of their day at school, the inclusion of WinS in the SDG-6 turns out to be a testimony to their standing as key components of a 'safe, non-violent, inclusive and effective learning environment' (United Nations 1989).

WASH in school programs in Uttar Pradesh dates back to 2010–2012, when more than 7,000 schools in 10 districts were made WASH compliant by the *Panchayati Raj* Department in partnership with UNICEF. Two years later in 2014, '*Swachh Bharat, Swachh Vidyalaya*' (Clean India, Clean School), a nation-wide campaign, was launched by the Government of India to support the ambitious national flagship program on sanitation '*Swachh Bharat Mission*' (Clean India Mission). This campaign was launched to set up well-functioning and well-maintained WASH facilities in schools in the country (Ministry of Human Resource Development 2014).

Clean school awards (*Swachh Vidyalaya Puraskar*)

In 2016, the central government started '*Swachh Vidyalaya Puraskar* (SVP)' (clean school award) that gave impetus to the Clean India, Clean School campaign for developing critical WASH facilities in the schools as per the standardized child-friendly norms. However, the interventions carried out under Clean India, Clean School campaign were primarily targeted at physical achievements and failed to put much emphasis on behavioral practices of children, quality and sustainability of available WASH services which led to significantly limited outcomes (Borthakur & Baruah 2019). The SVP was rolled out again in 2017 by the Ministry of Human Resource Development (MHRD), Government of India. In 2017, *Samagra Shiksha Abhiyan* (SmSA) (comprehensive education campaign) of Department of Basic Education of Uttar Pradesh in partnership with UNICEF, Field Office of Uttar Pradesh and district administrations extended its support to government-run elementary schools to participate in the award competition. The explicit purpose of this award is to honor those schools that have taken significant steps towards fulfilling the mandate of the Clean India, Clean School campaign (Swachh Vidyalaya Puraskar 2017-18).

Thus, there was an opportunity for schools to strengthen their WASH facilities that comprised the following five key components, namely (i) water, (ii) toilet, (iii) hand washing with soap, (iv) operation and maintenance of WASH facilities and (v) behavior change and capacity building of users, including the teachers and staff. Indicators related to each of these components were assigned a certain weightage ranging from 1 to 4 depending upon basic to improved services on a scale of 100, that is, 22, 28, 20, 15 and 15, respectively.

Weightage is assigned on the basis of SVP guidelines that standardize the benchmarking for WASH facilities and practices in government-run schools. Following this, a system of '5-Star' ranking was also introduced at national level by the MHRD for clean school award. In India, the 5-Star approach has been designed to improve safe water supplies, sanitation and hygiene in schools. It complements UNICEF's broader child-friendly schools initiative and GIZ's 'Fit for School' global approach, which aim to institutionalize health-promoting behaviors among school-going children. GIZ is a federal enterprise working for improvement of the education system and is owned by the Federal Republic of Germany (Stavem 2019).

Schools scoring 90–100% were to be ranked '5-Star' (green), 75–89% as '4-Star' (blue), 51–74% as '3-Star' (yellow'), 35–50% as '2-Star' (orange) and below 35% as '1-Star' (red). Akin to the ranking scheme, an assessment checklist (encompassing the five components enumerated above) was developed to conduct the online survey of WASH facilities and related components in participating schools. An online dashboard and validation protocols for '5-Star' and '4-Star' schools at district, state and national level through third parties were also institutionalized for tracking progress, ensuring accountability and transparency and validation of reported data of schools eligible for the award under different categories (SVP, MHRD 2017–2018).

Operation Vidyalaya Kayakalp

Drawing learnings from these nation-wide initiatives, a district-wide mega school transformation campaign took off in 2016–2017 in two districts of Uttar Pradesh, namely Mirzapur and Shravasti, led by the respective district

administration in collaboration with UNICEF, which finally evolved into a state-wide mission named OVK (operation school transformation or OVK) led by the honorable Chief Minister of the state in the year 2018.

A standard operating procedure (SOP) was also developed to strengthen WASH facilities, services and behavior practices in schools, which highlighted the standardization of technical norms and designs, capacity building of stakeholders, training of masons and plumbers, monitoring of ongoing school activities and progress reviews to accelerate implementation. For illustration, when the SVP was launched in 2016, only 2,741 schools managed to participate and complete their award assessments. But the next year in 2017, the participation of schools for the award astonishingly shot up to 72,155. However, only 52,917 schools managed to qualify for the final registration by providing complete information on 39 indicators before the deadline. Of which, 6,320 schools ranked '1-Star', 18,067 schools got '2-Star' and 26,366 schools ranked '3-Star', whereas 1,722 schools ranked '4-Star' and 142 schools achieved '5-Star' status, and two of them won the national award.

This was in essence the outcome of collective efforts of Department of Basic Education's SmSA, *Panchayati Raj* Department, district administration and UNICEF that helped in building enabling environments and program perspective of a wide range of stakeholders to prioritize WinS that led to increased participation of schools in SVP. It was an important step towards the institutional strengthening of WASH for OVK.

METHODS

The foundations were laid by the *Panchayati Raj* Department in the year 2017–2018 and this was continued in 2019 by SmSA and district administrations integrating a number of programs focusing on WASH in schools, namely *Swachh Bharat* Mission, *Swachh Baharat Swachh Vidyalaya*, SVP and Operation *Kayakalp*. The Director General, School Education of SmSA, with technical support from UNICEF worked together to take forward OVK to a state-wide campaign for transformation of WASH and basic infrastructure in schools. This campaign was further aligned with another innovative campaign of SmSA named Mission *Prerna* that works to improve the quality of elementary education and learning outcomes in all government elementary schools. The program took off with an online rapid assessment to ascertain the status of WASH facilities and basic infrastructure in elementary schools across 75 districts, in November–December 2019. It began with the field testing of online assessment tools and the IT system by gauging the capacity of identified assessors and their means of verification. Based on the analysis of preliminary data, technical errors occurring in online tools were rectified, capacities of field staff were enhanced and an interactive online OVK dashboard was developed. Thus, the mammoth exercise of baseline assessment of WASH facilities and basic infrastructure in schools was successfully accomplished by using an android-based mobile app in February–March 2020.

The baseline assessment included a comprehensive checklist of 28 indicators (contextualized for the state based on SVP indicators) administered in 114,790 schools across 75 districts of the state using mobile application in February–March 2020. This online checklist had a list of questions regarding assessment of availability and functionality of 19 key WASH and basic infrastructure in schools. The assessment was conducted by a team of 2,007 special educators officially designated as Itinerant Resource Teachers (IRTs). The IRTs were trained in the use of the mobile app, along with an orientation on WASH components and their significance for educational and nutritional outcomes of children as mandated under the Right to Education Act, 2009.

The midline assessment was conducted during March–July 2021, covering 131,388 schools across 75 districts. The duration of the midline extended due to the local body election in the state- and nation-wide lockdown of the second wave of the COVID-19 pandemic. The total number of schools assessed were increased due to improved programming in terms of planning, training, IT services, monitoring and follow-up support. The number of assessors also increased from 2,007 to 3,987. An interactive OVK dashboard, hosted by SmSA in the Mission *Prerna* portal at www.prernaup.in, was put in place to reflect consolidated assessment findings of block, district and state. The geo location of the schools and photographs of available WASH and basic infrastructure were also captured in the mobile app. The number of indicators was increased to 39 (by including an additional 11 indicators on costing, financing and implementation for informed decision-making and improved programming). Midline assessment was conducted by a trained team of 3,987 State Resource Group members (SRGs) and Academic Resource Persons (ARPs) of SmSA (checklist available at https://www.basicshikshakparivar.com/2021/03/assessment-checklist-for-mediline.html). These 39 indicators capture the augmentation and compliance status of 19 key WASH and basic infrastructural items comprising water, toilets, urinals, hand washing facilities, classrooms, mid-day-meal kitchen, accessibility, electrification, painting and school premises. These 19 key items
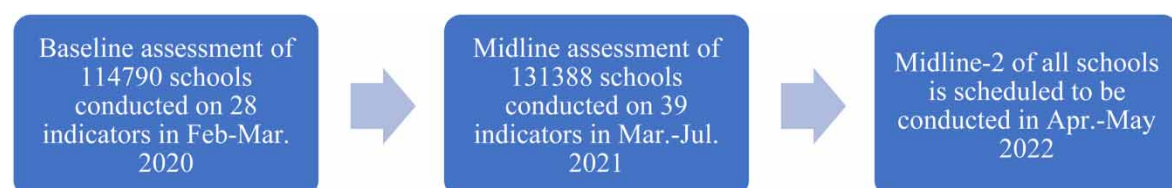
Table 1 | Indicator-wise description

Indicator	Description[a]
Safe drinking water	At least one drinking water source; either India Mark-II handpump or deep borewell inside the school premises or connected with village piped water supply scheme (PWSS).
Running water supply	Village or standalone PWSS sourced from India Mark-II handpump or deep borewell. Daily provision of adequate water for toilets, hand washing, school cleaning, food preparation and cooking.
Boys' and girls' toilets (including urinals)	Separate toilets for boys and girls, with one unit generally having one toilet (WC) plus three urinals. A hand washing unit with soap must be installed inside/nearby the toilets. There should be a minimum distance of 10 m between toilets and drinking water source to avoid contamination.
Toilets with tiles	Stone or ceramic tiled floor with adequate slope towards the pan and maintainable durable finish.
CWSN toilets	One toilet with special fixtures such as ramp, wide door, matte-finish tiles, handrails and handlebars for use by the children with special needs (CWSN)/differently abled persons. A hand washing unit with soap must be installed inside the toilet.
Multiple hand washing units	Sufficient group hand washing facilities allowing 10–12 children to wash hands at the same time. The hand washing units should be child-friendly, simple, scalable as well as sustainable, relying on minimum water. These hand washing facilities can be developed using local materials.
Classrooms with tiles	Stone or ceramic tiled floor with adequate slope and maintainable durable finish in each classroom.
Black/green/white boards	One black/green/white board of adequate size preferably 2,100 mm×1,300 mm (sill 800 mm) and durable quality inside each classroom.
Renovated kitchens	Cement, stone or ceramic tile floor with adequate slope and maintainable durable finish, safe drinking water point, hand washing point, elevated platform and an outlet for grey water towards a nearby kitchen garden or soak pit or drainage.
Whitewash/painting of school building	School building, classrooms and WASH facilities painted with attractive multiple colors, displaying various messages related to knowledge and personality development, following the concept of Building as Learning Aid (BaLA).
Ramps and railings	Ramps with a gradient of 1:12, handrails on both sides and maintainable durable matte-finish or dotted tiles.
Electrical appliances	All classrooms and toilets with functional electrical wiring and electrical points for lights and fans.
Electric connections	Regular power supply either government electricity connection or solar power or both.
School furniture	Sufficient quantity of desks and benches of adequate height in each classroom for all enrolled children.
Boundary wall	School premises surrounded by plastered brick wall of adequate height with a main gate and iron grilled panels.

[a]*Source*: National *Swachh Bharat Swachh Vidyalaya* guidelines and OVK, Technical Design Manual U.P, India (available at: https://www.prernaup.in/).

(mentioned in Table 1) were prioritized for universal coverage of WASH facilities and basic infrastructure in schools. Looking at the identified gaps and funding availability, 14 infrastructural items were prioritized for universal coverage by the end of March 2021, whereas it was decided that the remaining five indicators, which include installation of submersible pumps for running water supply, augmentation of boys' and girls' urinals, furniture (desk-bench) in classrooms and boundary wall, were to be covered by March 2022 (Operation Kayakalp Archives n.d).

Summary of school assessment coverage under OVK

Baseline assessment of 114790 schools conducted on 28 indicators in Feb-Mar. 2020	→	Midline assessment of 131388 schools conducted on 39 indicators in Mar.-Jul. 2021	→	Midline-2 of all schools is scheduled to be conducted in Apr.-May 2022

An online planning template was added in the Management Information System (MIS) of *Prerna Portal* to facilitate a uniform OVK planning on 14 priority infrastructural items (as mentioned above) of 833 blocks of the state. The progress of the OVK plan was also monitored through an online monthly progress report (MPR). The mechanism of Interactive Voice Response System (IVRS) call was employed from June 2020 onwards, for real-time tracking of work progress status and inter-departmental convergence. The headteachers of schools were contacted on a weekly/fortnightly basis according to the critical operational issues identified through multiple sources. The average response rates of IVRS calls were 75–80%. District performance rating was prepared based on the data received through call responses and shared by the Director General, School Education to all 75 District Magistrates (DMs) and District Education Officers for remedial actions.

An online Project Monitoring and Information System (PMIS) was also instituted to track physical and financial progress against the approved civil work of SmSA. There is a provision in the PMIS to upload the overall fund utilization certificate of the district on each activity to supplement the progress reported. An online Data Capture Form was also integrated in the MPR window for rapid collection of specific data on electrification, additional classrooms and fund leveraging, etc. to support decision making at state level. Funds have been leveraged from composite grants and civil works of *SmSA*, finance commission grants of *Panchayati Raj* Department, urban local bodies, district mineral fund and corporate social responsibility. Moreover, the data progressively made available through PMIS, MPR and IVRS calls were primarily employed in block and district performance ranking. This also served the critical purpose of course-correction at the district level and promoting healthy competition among the stakeholders engaged in transformation efforts under the leadership of respective DM. The 'star-ranking' approach outlined above was followed and an equal weightage of '1' assigned to each indicator for uniformity. Lowest performing schools were assigned '1-Star', whereas the best performing schools received a '5-Star' rating. Schools achieving 5-Star and 4-Star were adjudged 'transformed' and evolved into 'learning labs' for neighboring schools.

Learning labs

The idea of a '*Learning Lab*' as a methodology has been adopted keeping in mind the enormity of scale and physical explication of locale-specific and child-friendly structural design of WASH facilities. The schools designated as learning labs served the purpose of a local working model and this was capitalized on successfully for on-site training of key stakeholders such as teachers, elected head of the village council (*Gram Pradhan*), secretary and masons and recognizing the efforts of champions for scaling up.

Capacity building

In March 2020, lockdown began due to the pandemic. This disrupted the progress of the campaign as all schools were closed and administrative machinery came to a halt. The Chief Secretary of State (administrative head of state government) ordered on 29 April 2020 that essential WASH facilities should be constructed in all the schools while the schools were closed and migrant laborers could be employed in this process. This was a win-win scenario where the migrant laborers got employment and schools became WASH compliant and construction work could be carried out unhindered.

Making judicious use of emerging online platforms, *SmSA* and UNICEF took on the primary task of connecting key stakeholders across levels for providing technical and operational assistance, in terms of training, motivating through champions, monitoring, documenting best practices and advocacy, etc. through virtual platforms to keep the ball rolling:

• Between 21 May 2020 and 3 July 2020, a number of online refresher trainings on child-friendly structural design of WASH facilities were conducted, wherein 63,184 key stakeholders including block officials, teachers, elected village representatives and village council secretaries across 16 districts were oriented. This led to replication of child-friendly designs and best practices at the school level. Composite progress of each school on 14 priority items was regularly uploaded on the portal.

• The second round of divisional meets was conducted online throughout the state, chaired by the Director General, School Education in the months of June and July 2020 (post lockdown) to reaffirm the mandate of WASH in schools as a priority for district administration. In order to sustain the focus at scale, newly appointed DMs, Chief Development Officers (CDOs) and Block Education Officers (BEOs) were also oriented through online platforms on the broader idea and technical nuances of the school transformation campaign. They were also guided by the state authorities and development partners through regular meetings and contacts.

- Based on the analysis of MIS data and district performance ranking, the Director General, School Education conducted online face-to-face meetings to nudge DMs and CDOs of 10 poorly performing districts on a weekly basis.
- A positive deviance was brought about by providing platforms to real change-makers and champions. Online monthly progress review meetings were capitalized on to facilitate cross-learning and dialogue among District Education Officers of 10 best progressing and 10 slowest progressing districts, as well as BEOs of the 50 best performing and 50 slowest performing blocks.
- The Department of Basic Education and *SmSA*, on the other hand, proactively ensured the highest level of political and bureaucratic support for this program based on the successful evidence generated from the demonstration of a district-wide approach in selected districts, led by the DMs. From this standpoint, the DMs of focus districts emerged as the real-time champions!

Statistical analysis

In this paper, we have presented the percentage coverage of 19 key WASH and basic infrastructural items in the baseline and midline assessment. *Z*-statistic has been used to test the significance of differences in their values from baseline to midline. Table 1 provides a description of each of the 19 items included in the analysis. Microsoft Excel software was used to compute value of the test-statistic and the corresponding *p*-values.

RESULTS

Table 2 enumerates baseline and midline assessment on 19 key priority infrastructure items and their percentage coverage. In the midline survey, significant changes were observed in coverage of 15 of 19 items. The significant and substantial improvements were observed in the coverage of running water supply (from 19.1 to 68.3%, $p < 0.001$), multiple hand washing units (from 8.3 to 62.9%, $p < 0.001$) and toilets with running water (from 14 to 58.6%, $p < 0.001$). Due to lockdown and consequent closure of schools, it was not possible to assess the impact of improvement in school infrastructure, particularly WASH facilities, on children's attendance, their learning outcomes and their behavioral change with respect to the use of WASH services.

Table 2 | Comparison of baseline and midline coverage findings

Indicators	Baseline data, February–March 2020 (%) (*n* = 114,790)	Midline data, March–July 2021 (%) (*n* = 131,388)	*p* value	Status of statistical significance
Safe drinking water	77,076 (67.2)	112,429 (85.6)	0.0005	Significant
Running water supply	21,961 (19.1)	89,781 (68.3)	< 0.0001	Significant
Boys' toilets	68,578 (59.6)	105,938 (80.6)	0.0001	Significant
Girls' toilets	70,463 (61.4)	107,773 (82.0)	< 0.0001	Significant
Boys' urinals	30,471 (26.5)	66,771 (50.8)	< 0.0001	Significant
Girls' urinals	36,210 (31.5)	71,975 (54.8)	< 0.0001	Significant
Toilets with running water	16,035 (14.0)	76,928 (58.6)	< 0.0001	Significant
Toilets with tile	41,150 (35.9)	73,669 (56.1)	0.0002	Significant
CWSN toilets	6,635 (5.0)	21,233 (15.9)	< 0.0001	Significant
Multiple hand washing units	9,508 (8.3)	82,591 (62.9)	< 0.0001	Significant
Classrooms with tiles	27,869 (21.3)	40,368 (30.7)	0.0278	Not Significant
Black/green/white boards	94,077 (82.0)	119,346 (90.8)	0.0357	Not Significant
Renovated kitchens	62,374 (47.1)	104,489 (79.8)	< 0.0001	Significant
Whitewash/painting of school building	64,061 (55.8)	117,778 (89.6)	< 0.0001	Significant
Ramps and railings	44,201 (38.5)	88,044 (67.0)	0.0001	Significant
Electrical appliances	33,161 (28.9)	98,432 (74.9)	< 0.0001	Significant
Electric connections	56,565 (49.3)	92,255 (70.2)	0.0001	Significant
School furniture	21,233 (18.5)	23,093 (17.6)	0.5870	Not Significant
Boundary wall	63,384 (55.2)	86,446 (65.8)	0.0277	Not Significant

Source: https://www.prernaup.in/.

The key reasons behind successful implementation of the school transformative initiative are summarized as follows:

- An enabling environment created by the proactive political and bureaucratic leadership at the state and districts.
- Use of comprehensive MIS with digital tools for assessment, planning, budgeting and monitoring.
- Capacity building of stakeholders at all levels; use of technical manual, tools and visual aids to ensure child-friendly facilities and quality work. Use of virtual platforms to reach out to large numbers of stakeholders for training and follow-up support.
- Inter-departmental coordination for resource leveraging. Healthy competition among elected representatives of the villages and teachers for development of better schools for their children.
- Partnerships with development agencies; promotion and appreciation of innovative actions to address emerging bottlenecks.
- Media coverage of best practices/success stories along with felicitation of champions by the higher authorities and elected representative.

The comprehensive OVK-MIS and the use of online platforms for assessment, planning, capacity building and monitoring played a crucial role in informed decision-making and results-based programming. The collaborative OVK campaign of Uttar Pradesh has successfully leveraged around INR 45.71 billion (634.95 million USD) from multiple sources of public financing to improve school-based access to WASH facilities in the state.

Learnings

The school transformation campaign (OVK) implementation process offers four discernible areas of learning. First, the thrust on *gram panchayats* (village council) and support of teachers as the crux of the program was a rational choice marked by the commitment to the idea of community involvement. Second, the MIS was made justifiable through a process of transparency and accountability as the basic tenets of governance. Slowly and steadily, the approach generated confidence among the teachers, community members and their representatives, in addition to other key stakeholders. Third, the overtly hierarchical system of bureaucracy was made more open by the personalist functioning of the majority of team leaders and the requirements of structural wisdom, brought in by the Director General, School Education. The experience, however, highlighted the fact that any such transformation initiative could be made effective with reliance on people's participation and their sense of ownership. Fourth, the program teaches how a sense of hope can be invoked among the people in general and children in particular in the government schooling system. One comes across scores of motivated education officers at all levels, Gram Pradhans (*elected village heads*) and head teachers, enthusiastic about the prospects of an 'enrollment explosion'.

Challenges

The coronavirus pandemic was the biggest stumbling block in leading the program to the grand accomplishments as envisaged; however, hand washing with soap at household level increased due to COVID response interventions of the state (Jatav *et al.* 2021). The instances of school closure for 16 months (from 22 March 2020 to 4 February, 2021 and again from 23 March 2021 to 31 August 2021) withered away the prospects of children's participation and prevented the community and teachers from playing their entrenched role in the physical process of transformation and bringing about behavioral change in observance of WASH practices among the school incumbents. The opportunities to demonstrate and establish the mechanism of operation & maintenance and sustainability through community of practices, including alumni engagement, were put on hold due to the pandemic. In addition, leveraging finances from *gram panchayats* was also constrained in the last two quarters of the financial year 2020–2021 due to shifting priorities in the event of their elections. Finally, poor internet connectivity in remote rural areas and limited IT expertise of some frontline functionaries created unwanted delays in monitoring and reporting and thus affected informed decision-making.

Mitigation measures

Several mitigation measures were adopted in view of above-mentioned challenges. First, the programs of '*Swachh Bharat* Mission' and 'SVP' were restrained under the prevailing conditions of uncertainties to provide a sense of direction to the program and setting up priorities from afresh. A government order of 30 October, 2019, however, clarified the obligations, with categorical emphasis on universal coverage of child-friendly WASH infrastructure

in all the government schools (*letter no. 2706/33–03-2019 dated 30.10.2019* issued by the Chief Secretary, *Uttar Pradesh*). It was essentially the use of Information and Communication Technology (ICT) which kept the wheels moving during the lockdown. Work-from-home enabled by ICT and the opening of digital platforms ushered in a new era of virtual human interaction – webinars, online meetings and capacity building sessions along with online review and assessment processes as well as the use of WhatsApp groups at all levels were very effective in accomplishing the set targets. Second, the online database of PMIS and PFMS (*SmSA* and PRD) were capitalized on for mapping and accessing unused funds of composite funds of SmSA and finance commission grants of *gram panchayat*. This further helped in employing incoming migrants in school transformation work. Third, the intense campaign during the period following the month of June 2020 registered phenomenal achievements. Stepped up monitoring comprising regular online monthly meetings, consistent review of progress recorded by each *gram panchayat* and schools, steady follow-up, block-level meetings of *gram pradhans* and teachers, establishment of district- and block-level 'war rooms' for regular follow-up of frontline functionaries – these together brought the progress close to the target. Fourth, the WASH team of UNICEF took on the primary task of providing 'Technical Assistance' – comprising training, planning, handholding support, connecting champions and facilitating cross sharing and evidence-based advocacy, etc. at state, district and block levels through virtual platforms and on-site support.

DISCUSSION

We found increasingly high participation of schools in OVK and moderate levels of adherence to child-friendly WASH standards by the participating school. While we acknowledge that OVK is still being implemented and a true measure of its impact on sustained availability of WASH facilities and education outcomes may only be available in future, our initial findings corroborate with the results obtained from interventions for improving WASH infrastructure in schools in Laos (Chard & Freeman 2018), Mali (Garn *et al.* 2017) and Kenya (Garn *et al.* 2016). These studies found that interventions could reach a large proportion of targeted schools; however, improvements in the availability of WASH facilities were either moderate or low mainly due to the lack of availability of running water for hand washing or toilet flushing. Insights from our concurrent monitoring are also consistent with the results obtained from a similar 'Three-Star Approach' implemented in a few countries (DepEd 2021; UNICEF 2021). The 'Three-Star Approach' also resulted in significant improvement in the school's compliance with the critical WASH indicators while struggling with the indicators which require higher investments for sanitation infrastructure and their operation and maintenance for sustainability.

OVK has built upon the learnings and challenges observed from other similar interventions implemented at scale. Like the innovative Three-Star Approach implemented in the pacific (UNICEF 2021) and school-based interventions in Rural Tanzaina (Hetherington *et al.* 2017), OVK also engaged and empowered schools and communities so that they can support improvements to WASH facilities in schools using local resources. The implementation of 'learning labs' was an additional and critical strategy not only for identifying local solutions to the local problems in a given context, but also to create promoting healthy competition among the stakeholders. The culture of cross-learning was further strengthened by using online monthly review meetings as a platform to connect district- and block-level officers from better performing areas and from areas that were lagging. Additionally, OVK addressed two critical limitations related to availability of resources for sustainability and lack of robust M&E systems in the implementation of the Three-Star Approach (UNICEF 2021). First, OVK had a strong component of inter-departmental convergence for leveraging public financing from multiple sources for greater community ownerships, accountability and sustainability of interventions. Lack of adequate budgetary allocations for the recurrent costs of consumable supplies has been identified as one of the key bottlenecks in other school-based interventions as well (Garn *et al.* 2017). Since OVK leveraged funds from multiple sources of public financing, we not only believe we will see more improvements even in the indicators with higher resource needs, but also sustained achievements. Second, the monitoring and reporting mechanisms were kept robust and transparent through the use of advanced ICT tools such as new-age mobile-based data collection tools to collect images and geolocations, use of IVRS, linking data from several sources (baseline, improvement plans, midline assessment, monthly reports, funds utilization) to transform them into information in the form of an interactive dashboard. The robust monitoring systems were key to ensure intervention fidelity which has been reported as one of the key drivers of successful school-based interventions in the literature (Chard & Freeman 2018).

CONCLUSIONS

The innovative approach of using ICT-based tools to generate evidence, facilitate planning and monitor quality of implementation, along with a strong enabling environment resulted in achieving the desired results in a short span of time. Prompted by the success of the OVK program, the state is now all set to roll out a new transformation campaign for pre-schooling centers (*Aganwadi Kendras)* with UNICEF's technical support, that provide basic essential nutritional services to 5.6 million children belonging to the age-group of 3–6 years. This will be an important policy level initiative by the state government aimed at initiating young children to WASH facilities during their formative years.

DATA AVAILABILITY STATEMENT

Data cannot be made publicly available; readers should contact the corresponding author for details.

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