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Participatory Action Research for Sustainable Sanitation in India: Case of 10 villages from Palghar District, India

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Abstract:

Participatory Action Research (PAR) is a collaborative research approach that engages stakeholders in the research process to address complex social issues and drive sustainable change. This paper explores the application of PAR in the context of sustainable sanitation in India, where access to proper sanitation facilities remains a significant challenge. By involving community members, policymakers, and relevant organizations, PAR enables the identification of locally relevant solutions and empowers communities to take ownership of their sanitation practices. Drawing on case studies and empirical evidence, this paper highlights the effectiveness of PAR in promoting sustainable sanitation behaviors, improving infrastructure, and enhancing the overall well-being of communities (Chambers, 1994; Cornwall and Jewkes, 1995). It also examines the challenges and limitations associated with implementing PAR in the sanitation sector, such as power dynamics, resource constraints, and ensuring long-term sustainability (Reason and Bradbury, 2008). Through its participatory nature, PAR fosters inclusive decision making, knowledge co-creation, and transformative social change, making it a valuable research method for advancing sustainable sanitation practices in India and similar contexts. Present paper provides exhaustive literature review of PAR for Sustainable Sanitation followed by empirical case of PAR carried out in 10 villages of Palghar District in India. The paper includes qualitative inputs from multiple stakeholders to give clarity of on-ground situation and action.

Why Sanitation:

Jan Ellasson, Deputy Secretary-General, UN, remarks we are still farther from achieving millennium development goal of Sanitation. A JMP 2013 update says 2.4 billion people still lack access to a descent Sanitation facility; despite of significant progress much is still to be achieved (JMP report, 2013). The figures may not really be enlightening if we don't understand the impact it has, every 20 second a child dies as a result of poor Sanitation. Thus, access to a descent Sanitation, adoption of practice of good hygiene and safe water supply could save globally 1.5 million children yearly (JMP 2015 Update and MDG Assessment, Report, 2015). The same report observes in India 28% of the total population got an access to improved Sanitation facility but even today 44% of the total population still practice open defecation. Post 2015, now the 2030 Sustainable development agenda targets to achieve access to adequate, equitable sanitation & hygiene for all with no open defecation. It has a special focus for women, girls and those in vulnerable situations. At this backdrop any experiment to help improve sanitation becomes highly significant humanitarian responsibility if carried out scientifically with Community participation.

Literature Review:

The topic search of Participatory Action Research within Sanitation topic gave result of 195 documents. The literature review for current research is based upon 34 Scopus indexed Research Articles, 45 Research Reports, Publications and 12 internet based articles from important Universal agencies like United Nations (UN), World Health Organization (WHO), Unicef and Water, Sanitation and Hygiene (WASH) and other Non-governmental Organizations (NGO). Literature in the area of Sanitation is very rich, moreover very readily available and documents very well the facts, experiments and future plans in the field of Sanitation with special focus on Participatory Action Research as powerful methodology. Analysis into the database reveals some interesting facts.

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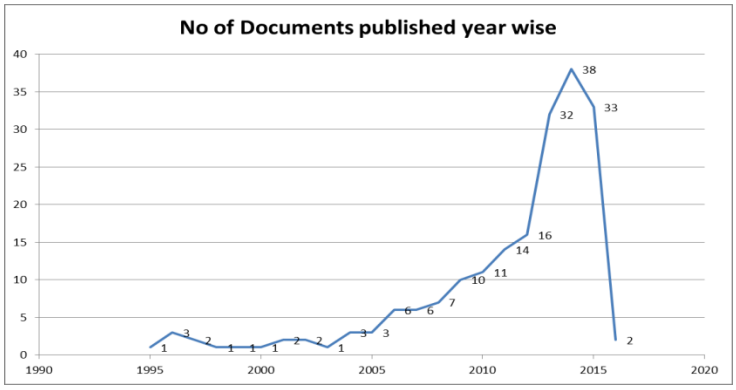

Fig. 1 Number of Documents published year wise

Fig. 1 clearly brings forth the rising trend of documents being published with PAR methodology being used in Sanitation with highest number of publications in the year 2014.

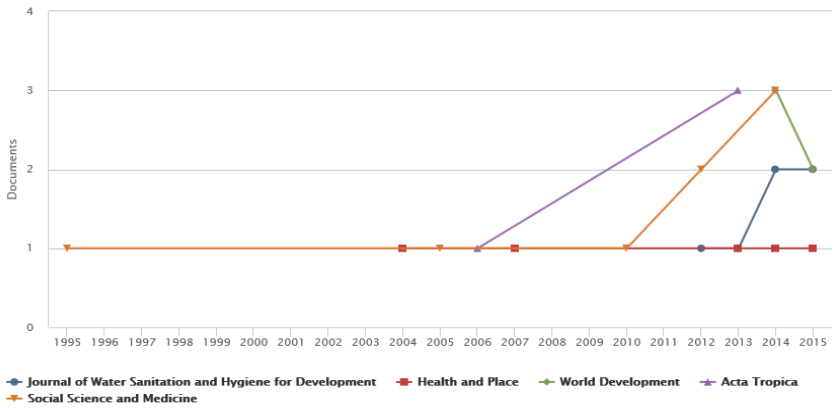

Fig.2 Five topmost sources of Publication

Fig. 2 shows the five topmost sources of publication, highest number coming from Journal of Water, Sanitation and Hygiene for Development.

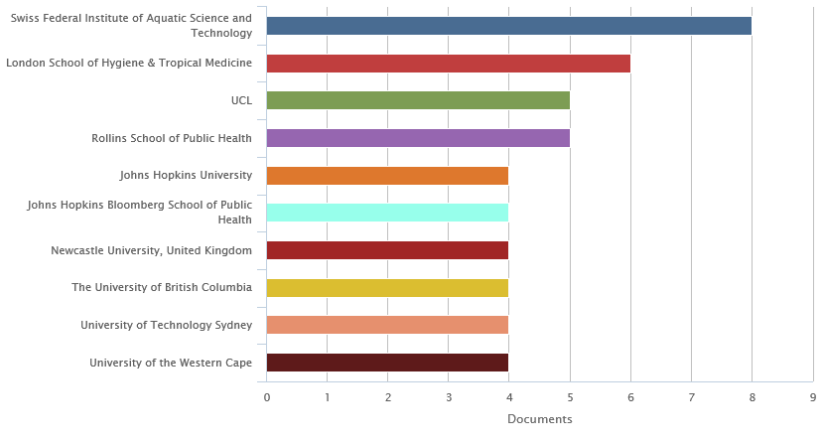

Fig. 3 Top 10 Affiliations- PAR Sanitation

Fig.3 shows topmost 10 affiliations and top three being Swiss Federal Institute of Aquatic Science and Technology, London School of Hygiene and Tropical Medicine and UCL.

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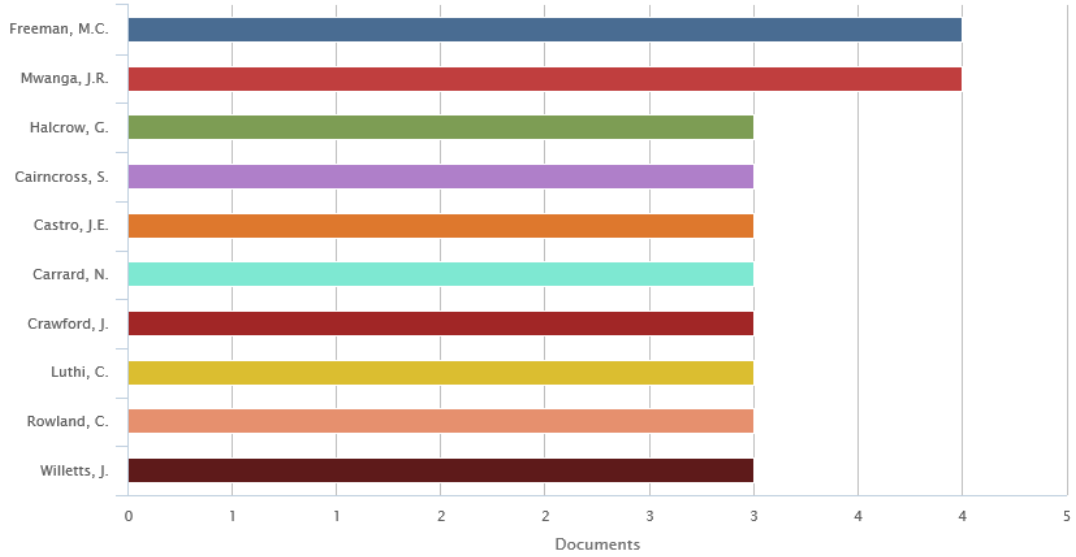

Fig. 4 Top 10 Authors- PAR Sanitation

Fig. 4 shows top 10 authors for the publications in PAR Sanitation top two being Freeman M.C. and Mwanga J. R.

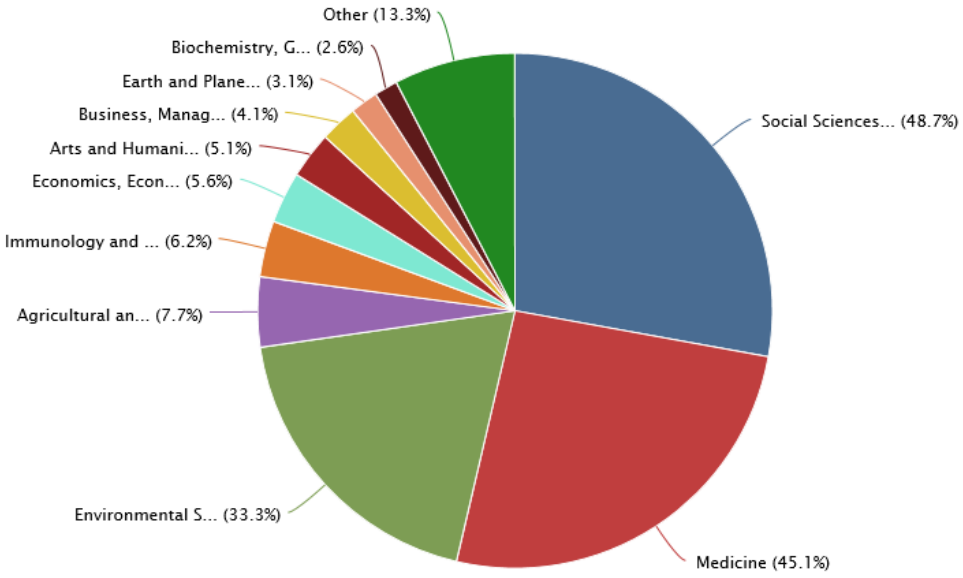

Fig. 5 Subject area wise distribution of publications- PAR Sanitation

Fig. 5 depicts the subject area wise distribution of publications of PAR Sanitation majority of publications coming from Social sciences, Medicine and Environmental Sciences.

Sanitation and Participatory Action Research- Literature review: EcoSan club (2008) very rightly defines Sanitation as all interventions aimed at protecting & promoting human health necessarily with a clean environment, which in turn breaks the cycle of disease. The compendium compiled by Roma and Curtis (2013) mentions about the major players in Sanitation operating in India viz. Borda, Community Led Total Sanitation, E-Kutir, Gram Vikas, Gramalaya, 3SI, Sulabh International apart from the others. Meta-analysis and critique of 90 Research papers, white papers, compendiums and reports has resulted into the content analysis as given in fig.1

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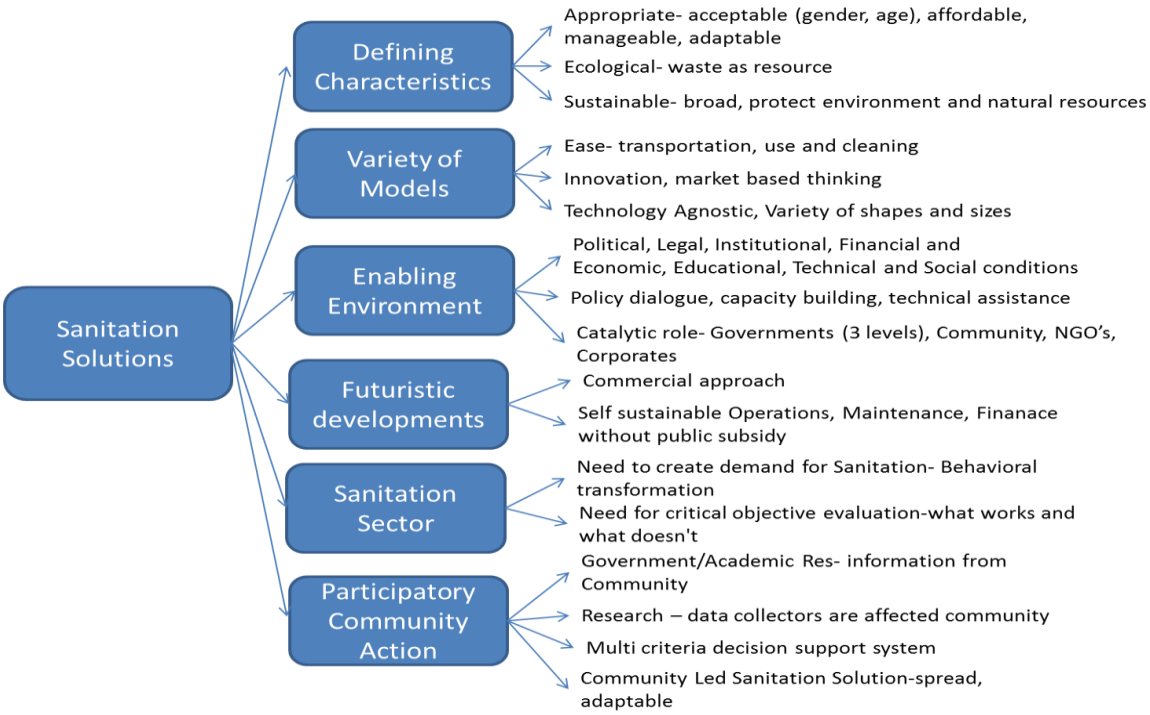

Fig. 6 Content Analysis: Meta Analytic review

Further summary table was prepared for more relevant Scopus indexed Research Articles to present the overview much on the same lines as categorization, in terms of geographical characteristics of area being studied, focus of study- Sanitation technology, Sustainability (Environmental, ecological and Inclusive), Behavioral interventions, Enabling environment (Governance, Privatization and Policy).

Table1 : Meta Analytic overview summary table based on categories of content analysis

Sr. N.	**Author**	**Document Type**	**Region/ Country**	**Rural/ Urban**	**Technology**	**Behavioral Interventions**	**Enabling Environment- Governance/ Policy**	**Monitoring and Sustainability**	**Recommendations**	**Methodology**
	Madon et. al., 2018	Research article	Tanzania	Rural		Community participation for improved tropical diseases and WASH intervention programs	Focus is majorly on improving sustainable village health governance.	Sustainability of WASH programs is main focus considering its critical role in reducing tropical disease occurrences.	Researchers identify five key social processes enacted by the EDG model that have led to improved health benefits related to frequency of meetings and attendance, promotion of health and sanitation awareness, income-generating	Researchers carried out pilot which adopted a mixed methods case study approach to implement an Enhanced Development Governance (EDG) model using existing village governance structures.

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									activities, self-organising capabilities, and interaction between village bodies. These findings hold important implications for conceptualising the role of community participation in sustaining NTD-WASH intervention programs and for sensitising institutional and policy reform.	
	Venkataraman an et. al., 2018	Research article	World	Both		CLTS	Focus of review is mainly to understand outcome of CLTS and its sustainability based upon monitoring	Focus is mainly on understanding whether CLTS outcome monitoring has been discussed in researches	Over one-fourth of the literature overstated conclusions, attributing outcomes and impacts to interventions without an appropriate study design. This analysis revealed the importance of adaptability, structured posttriggering activities, appropriate community selection, and further research on combining and sequencing CLTS with other interventions.	Meta analytic Literature Review based upon 200 selected documents after rigorous process.
	Crocker et. al., 2017	Research article	Ghana and Ethiopia	Both		CLTS	Focus is on improving governance by reducing	Sustainability of CLTS outcomes depends	The first study to present comprehensive, disaggregated costs of CLTS intervention.	Researchers used implementation tracking and bottom-up, activity-based costing to assess the process, program

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							costs. Researchers carried out difficult task of measuring costs in different locations and comparing to arrive at benchmark.	mainly upon financial management and training as part of CLTS. Researchers provide deep systematic study based insights for this.	The findings can be used to inform policy and finance decisions, plan program scale-up, perform cost-effectiveness and benefit studies, and compare different interventions.	costs, and local investments for four CLTS interventions in Ghana and Ethiopia. Data collection included implementation checklists, surveys, and financial records review.
	MacDonald et. al., 2017	Research Article	World	Both		Participatory Action for effective use of sanitation infrastructure	Review also focuses upon Governance for WASH and notes importance multiple stakeholders for improved outcomes	Reports lack of sustainability of WASH efforts due to fault in design, problem in maintenance, social conflict or lack of local compatibility	Review divides complete meta analytic study in 4 thematic areas for WASH. Major gap has been identified in the area of hygiene and participatory action is recommended to overcome this gap	Meta analytic literature review based upon 121 articles
	Hetherington et. al. 2017	Research Article	Tanzania	Rural		Participatory science and innovation-Sanitation Science Fair as an innovative capacity building approach	Governance approach of capacity building		The Project SHINE model shows promise as an innovative capacity building approach and as an engagement and empowerment strategy for youth and communities to develop locally sustainable strategies to	Pilot study engaged pastoralist high-school students and communities in the development and evaluation of culturally and contextually relevant strategies to improve sanitation and hygiene.

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									improve sanitation and hygiene.	
	Garn et. al., 2017	Research article	World	Both						
	Walters et. al., 2017	Research article	Nicaragua	Rural		'Participatory Systems-based Planning and Evaluation Process' (PS-PEP) that combines structural factor analysis and collaborative modeling to guide teams of practitioners, researchers, and other stakeholders through a process of modeling and interpreting how factors systemically and dynamically influence sustained access	The model is participatory governance model designed to improve quality of WASH services	Sustainability is central to the theme with focus of the complex nexus issues of WASH which led to development of innovative model-PSPEP	PS-PEP provides a powerful tool for WASH project or program planning, evaluation, management and policy, the continued use of which could offer unprecedented growth in understanding of WASH service complexity for a broad spectrum of service contexts	Complex adaptive system based approach to understand inter-connect of WASH with other systems as Political, legal, socio technical, environmental tec.

						to WASH services				
	Acker et al., 2016	Research article	Mozambique	Urban		Participatory Rapid Sanitation System Risk Assessment- which combines assessment of sanitation infrastructure with local stakeholder knowledge of environmental health risks	Focus is mainly on Governance of Sanitation chain, sanitation infrastructure and faecal sludge management (FSM) services in order to understand the relative magnitude of the associated environmental health risks	Focus is mainly sustainability impact assessment/ environmental health risk assessment	The risk assessment framework provides a comprehensive and systematic assessment of sanitation related risks using a structured framework of indicators that take into account a wider range of factors that are not normally considered during planning processes. It uses local stakeholder knowledge as part of a participatory and rapid risk assessment methodology that assesses the risks in order to prioritise interventions to reduce these risks.	Municipal sanitary survey combined with local stakeholder participation led environmental health risk assessment
	Srivastava et. al., 2016	Research article	Eastern India	Rural		Village health sanitation and nutrition committees- participatory community health forums	Decentralized planning and community action committee	Monitoring lacks conspicuously	VHSNCs perform few of their specified functions for decentralized planning and action. If VHSNCs are to be instrumental in improving community health, sanitation and nutrition, they need	It carries out cross-sectional survey of 169 VHSNCs and ten qualitative focus group discussions with purposively selected better and poorer performing committees, across the two states of eastern India.

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									education, mobilisation and monitoring for formal links with the wider health system.	
	Bastien et. al., 2016	Research article	Tanzania	Rural		Project SHINE (Sanitation and Hygiene Innovation in Education), in which a school-based participatory science education, empowerment, and social entrepreneurship model of health promotion	It is a capacity building approach with aim to improve sanitation and hygiene through engaging youth as change agents to develop and sustain locally relevant health promotion strategies		The intervention and the sanitation science fair will provide a unique opportunity to build linkages between schools and the wider community and to foster youth interest in science and social entrepreneurship through innovative youth-driven projects.	The intervention was built on formative research and workshops and consisted of school-based lessons, extracurricular activities, sanitation clubs, community outreach events, and a sanitation science fair.
	Crocker et. al., 2016	Research article	Kenya	Urban		CLTS	It focuses on training and capacity building for improved CLTS outcomes		It focuses mainly on improving governance with training and capacity building. They discuss a conceptual framework for understanding outcome of training program	Experimentation is carried out with 46 trainees who participated 2 rounds of training programs.
	Bisung et. al., 2015	Research article	Usoma, Kenya	Rural		Explores utility of Photovoice for catalyzing			The findings illustrate that photovoice was an effective CBPR methodology	In the first part of the study, photovoice one-on-one interviews were used to explore local perceptions and practices

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						behavioral change in community led solutions for WASH			for understanding behaviours, creating awareness, facilitating collective action, and engaging with local government and local health officials at the water-health nexus.	around water-health linkages and how the ecological and socio-political environment shapes these perceptions and practices. This paper, which is the second component of the study, uses photovoice group discussions to explore participants' experiences with and (re)action to the photographs and the photovoice project.
1	Fry et.al., 2015	Research Article	Ethiopia	Rural	Arborloo			Yes	Catholic Relief Service Sanitation Marketing	Survey, Key informants, In-depth interviews of Rural Households
2	WASH & Unicef, 2015	Field Note	Malawi	Rural	Low Cost Construction-Corbelled pit latrine	Hybrid of National Sanitation Marketing program and participatory designs		Yes-Post ODF Sustainability, low cost technology	Unicef's Seven step Sanitation Marketing Program	Participatory Action Research
3	Halcrow et. al., 2015	Case Study	Vietnam	Rural		Integration of CLTS and Sanitation Marketing		Yes-Inclusive Saniation program with Women led Sanitation	Integration of Gender into CLTS of WASH programs	Participatory with appreciative inquiry
4	Festus et. al., 2015	Research Article	Nigeria	Urban		Collaborative approach		Yes-Sustainable Solid Waste Mgt.	Collaborative efforts among Community, Government and NGO for Sustainable Solid Waste Management	survey, focus group discussion, personal observation, oral interviews, as well as questionnaire administration

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5	Banana et. al., 2015	Research Article	Zimbabwe	Urban		Community led mapping to build partnership with local government for innovative pro-poor citywide sanitation strategies		Inequities in Sanitation	Low-income communities have used mapping, profiling and GIS to document their sanitation needs, and to leverage strategic relationships with local government	These are community-led and -executed household surveys documenting and collecting socioeconomic data on all residents in a given slum settlement used along with GIS data
6	MCGrahan, 2015	Research Article	Developing Countries	Urban		Community driven Sanitation Solutions	There are serious institutional challenges associated with low-cost sanitation in deprived urban communities. These include a collective action, a coproduction, a affordability versus acceptability, and related to housing tenure	Deprived Urban Community-inclusion	The nature of the challenges, and the means by which two successful community-driven initiatives have overcome them, suggest that while recognizing the human right to sanitation is important this should not be taken to imply that typical rights-based approaches are the appropriate means of realizing this right.	Review
7	Bardosh, 2015	Research Article	Africa	Rural		Community-led total sanitation (CLTS) offers a new, people centric approach conceptually	Rapidly scaled-up by local government, poor management and stakeholder engagement effectively diluted the		CLTS cannot be conceptualized as a blanket approach quickly bringing total sanitation to the masses. For its strengths to be realized in contexts of rural poverty,	Drawing on research in Katete district, Eastern Zambia, this paper explores tensions between CLTS theory, policy, practice and local realities.

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						grounded in participatory development. But despite its broad appeal, the CLTS policy narrative has become equated with quick results, low-cost, provocative language.	approach, and continued the ‘‘projectification” of the sanitation sector.		a targeted strategy that builds local institutional capacity and iteratively scales-up over time is needed. But realizing this in practice requires moving beyond a prevailing emphasis on ‘‘open defecators” to engage complex issues of power and politics in sanitation governance.	
8	Sigler et. al., 2014	Research Article	World-66 Countries	Both		Community Let Total Sanitation		Yes- 1 out of 10 surveyed org only have monitoring	Behavioral Interventions-CLTS are critical in stopping Open defecation	Survey of CLTS implementers (International NGO's)
9	Kenned y-Walker et. al., 2014	Research Article	World	Urban	World Bank model of Water and Sanitation program		Bellagio principles of good urban environmental Sanitation	Enabling environment framework for Sustainability, implementation at lowest level possible. Sanitation 21 Framework	Community-Led Urban Environmental Sanitation, use of Sanitation value chain and Sanitation ladder	Literature review
10	Herrera, 2014	Research Article	Mexico	Urban			Decentralization and Commercialization practices for effective Water and	Yes-monitoring whether these reforms worked sustaina	Political and institutional challenges have compromised the ability of urban governments	Comparing with International Water and Sanitation indicators

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							Sanitation arrangements	bly	to improve public services through self-financing reforms after decentralization. If federal and state governments played a greater role in supporting urban utilities, they could help extend the time horizon of local policymaking.	
11	Heller et.al., 2014	Research Article	Brazil	Urban			Brazilian National Basic Sanitation Plan with improved participation from social actors		10 extrinsic and intrinsic factors influencing the sector were considered, which led to the generation of a set of macro directives, strategies and targets for the expansion of access to water supply, sanitation, solid waste management and urban storm water management over the next 20 years	Situational Strategic Planning and prospective methods developed in a participatory process that consisted of several steps and involved various social actors, including governmental officials and authorities, informed by a team of experts in charge of the whole planning process
12	Iossifova, 2014	Research Article	Shanghai	Urban			Analyzing Physical and social consequences of Urban Sanitation systems and policies for Urban poor and ageing population	Speed of Sanitation transition systems impact on Low income Urban population	Changing sanitation cultures under urban development and diverging sanitation practices in different contexts can affect family ties, social relations and socio-spatial integration	In-depth, open-ended interviews with 20 low-income urban residents

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13	Jimenez et. al., 2014	Research Article	Tanzania	Rural			New policies are being defined which shift the role of public investment from infrastructure to sanitation promotion, and give the responsibility of service delivery to local government. This paper analyses the role that local governments can have in sanitation promotion in this new framework.		Recommendations for a more effective service delivery model are made, balancing the role of local government between direct execution, coordination and supportive supervision. The fact of having a government programme with some direct implementation can bring about important differences in the national ownership of, and interest in rural sanitation, which are greatly needed.	The implementation of the National Sanitation Campaign in Tanzania is analyzed using the problem driven governance and political economy analysis methodology.
14	O'Reilly, 2014	Research Article	India	Rural		It deploys a political ecology approach specifically to identify the multi-scalar political, economic, and environmental factors influenc			The elements of successful sanitation adoption depended on three factors (i.e., toilet tripod): (1) multi-scalar political will on the part of both government and NGOs over the long term; (2) proximate social pressure ,i.e., person-to-person contact between rural	The research uses ethnographic and technical methods in rural villages of West Bengal and Himachal Pradesh over the period September 2012 to May 2013.

						ing toilet adoption in rural India.			inhabitants and toilets; (3) political ecology, i.e., assured access to water, compatible soil type, and changing land use. This research contributes to studies of sustainable development and global public health by developing a theory and framework for successful sanitation.	
15	Goncalves, 2013	Research Article	Brazil	Urban			Decentralization with Participatory Budgeting	Longitudinal approach to understand sustainable impact	It suggests that promoting a more direct interaction between service users and elected officials in budgetary policy can affect both how local resources are spent and living standard outcomes	Analysis of Secondary data to study Effect of Participatory budgeting on Municipal expenditures and Infant mortality rate
16	Wells et.al., 2013	Research Article	World	Both		Participatory monitoring methods and multi-stakeholder processes are being used to increase transparency and account	the interest of national governments and donors in monitoring and evaluation, which is gradually shifting from counting infrastructure built, towards		The demand for continuous learning and adaptive management based on sound monitoring data can be stimulated by incentives and supportive institutional settings. The supply – the mechanisms, tools and	Community Scorecards, Community report cards and participatory monitoring method for quantifying qualitative change

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						ability and to facilitate dialogue, learning and joint action.	sustainable development and sector performance reviews		capacities for monitoring – must also be strengthened, especially the capacity to use monitoring data to take action. Learning-oriented monitoring processes can help identify capacity gaps, while the process of joint analysis, reflection and sharing lessons has the potential to build capacities. Commitment of stakeholders throughout the sector to do things better and differently is a critical element towards building learning and adaptive sector.	
17	Aboud et al., 2012	Research Article	Developing Countries	Both		Health behavior related to Millennium development goal.			Community Mobilization Programs with metric to assess change and focused on the audience	Literature review of articles based on behavioral change
18	Masuda et. al., 2012	Research Article	Canada	Urban		Assessment of Environmental determinants of health inequity using participatory		Inequities in Sanitation	Inequities symptomized as visible differences in environmental conditions across city settings may be understood as	Photography mediated qualitative approach for comparative neighborhood-level assessment

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						forms of Research. Photovoice is grass roots led methodology grounded in PAR combining visual and narrative data to convey socio-cultural experiences to policy influencers			relational construct manifestations of deprivation within inner cities only reveal systemic inequities when they are contrasted to environmental conditions in other parts of the city. It is through these observations that root causes might be identified and mechanisms ascertained.	
19	Chambers, 2012	Research Article	World	Both		Participatory Rural Appraisal/ Participatory Reflection & Action and Community led Total Sanitation			Sequences of participatory workshops which have evolved as creative collective experiences fed by and feeding into wider networking and dissemination. These workshops have been occasions for sharing practice and collating experiences, and going beyond these to generate ideas and evolve and agree principles and good practices. Critical	This article focuses on the second context which involves practitioners, activists, engaged academics and others who are outsiders to communities. While networking and dissemination have been major activities in PRA and CLTS, the events that are most identifiable, creative and productive for these actors have been participatory workshops. Author wrote from personal experience and fallible recollection, in part triangulated with recorded evidence.

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									reflections concern power, planning and process, theory of change and impact, lessons learnt, and an ongoing learning process	
20	Szanto et. al., 2012	Research Article	East Africa	Urban	The quasi-monopoly of pit latrines implies that improved sanitation technologies are not sufficiently rooted yet. Public toilets are crucial to these slums, especially where land tenure issues prevail. Although the potential of ecological sanitation is currently		Paper analyses the interface of sanitation policy and technology domains by reviewing the distribution and local characteristics of current centralized and decentralized sanitation options. The findings confirm that conventional, centralized sanitation is an unrealistic solution for application in slums.		Only the decentralized sanitation options are found to be viable in the assessed slums, but their servicing is increasingly neglected by the municipal authorities. Municipal authorities are advised to prioritize the implementation of elsewhere successful slum sanitation technologies and to integrate appropriate decentral solutions into their predominantly centralized sanitation schemes.	The reviewed sanitation data are categorized as centralized (off-site sewerage solutions with a central treatment facility) and decentralized (onsite). Within the decentralized category household level sanitation solutions, shared options (public toilets and shared household level toilets) and ecological sanitation technologies are defined and analyzed.

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					negligible, novel bio center initiatives are promising.					
21	Jewitt S. (2011)	Research Article	Asia	Both	Ecosan and Anaerobic digestion			Human waste as Resource	In more practical terms, there is an urgent need to understand how local socio-cultural norms surrounding human excreta interact with wider political, physical and environmental constraints if appropriate and sustainable excreta management systems are to be developed for over 2.6 billion people	In Trans-disciplinary theoretical debates, there is scope to enhance understandings of how and why these conceptualizations of technologies like ecosan and anaerobic digestion as taboos vary over space and time and the influence that this has on the arrangement of different rural/urban and indoor/outdoor spaces
22	Rheinländer et al., 2010	Research Article	Vietnam	Rural		Participant centered and problem based learning as part of Community based programs for improved water and sanitation practices	Response of Highland communities to government Sanitation interventions		Paper suggests that future hygiene promotion strategies aim for a closer match between community priorities and government hygiene policies, e.g. by allowing for a larger diversity of low-cost sanitation solutions. Scaling up participatory community-based hygiene promotion is	In depth interviews of villagers from 4 villages with ethnic minorities, 10 respondents from each village

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									also recommended to curb dependency and spark initiatives in ethnic minority communities	
23	Castro, 2008	Research Article	Developing Countries	Both			The policies promoting the expansion of private multinational monopolies as the main tool to solve the problems affecting water and sanitation services in less developed countries.		There is a need to learn from the past, when developed countries managed to achieve the universalization of essential services thanks to the convergence of a wide range of social and political forces, including free-market liberals, who accepted that essential services cannot be organized purely on market principles. It suggests that achieving similar success in LDCs will also require the amalgamation of a similarly broad and universalistic ensemble of social forces.	The paper examines the mainstream development policies that have been implemented worldwide since the 1980s to solve the problems affecting water and sanitation services (WSS) in less developed countries (LDCs
24	Gunatilake et. al., 2008	Working Paper	Developing Countries	Both			Lessons from Private Sector Participation in Water Supply and		While ownership itself hardly influences the efficient provision of Water Supply Sanitation services, the	The paper examines the experiences of Private Sector participation in the Water Supply and Sanitation sector

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							Sanitation in developing countries		interdependence of the public and private players should not be overlooked; a reasonably well-functioning public sector is a precondition for the success of private provision of WSS.	
25	McFarlane, 2008	Research Article	Mumbai	Urban			The Slum Sanitation Programme (SSP) is premised upon „partnership", „participation" and „cost-recovery" in the delivery of large toilet blocks as a practical solution to the stark lack and inadequacy of sanitation		The paper argues for a more flexible approach to policy infrastructure, technical infrastructure, and cost recovery in urban sanitation interventions. The paper also considers whether the SSP, as the largest city project of its nature in Indian history, marks a shift in the relationship between the state and the „slum" in Mumbai.	The paper reflects on the progress of the SSP by considering three key features of the programme: first, its policy infrastructure; second, its technical infrastructure, and third, its use of user charges as a basis for „cost-recovery
26	Waterkeyn et. al., 2005	Research Article	Zimbabwe	Rural		Community Health Clubs			Issue of membership card with topics and weekly meetings to debate on it	1244 health promotion sessions were held by 14 trainers, costing an average of US$0.21 per beneficiary and involving 11,450 club members (68,700 beneficiaries). Qualitative and Quantitative studies

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Sanitation in India with special focus on Rural:

The Central and State governments in India have taken many important decision in last 15 years in order to improve the sanitation state and the announcement of Swaach Bharat (Clean India) campaign can be considered as the most critical step which has brought the momentum and better enabled environment (PriMove, Unicef and WSSO 2014). The campaign sets a high target of 110 million toilets till 2019 i.e. 4 toilets per second which is remarked as 4-5 times the present speed of building household toilets (Financial Times, India Today 2015). Figure 2 provides the chronological sequence of major events since 1980 when Water supply and Sanitation received prominence in government's five year plan.

According to experts, demand driven community based strategies introduced in 1999-2000 is considered as the most decisive policy change that led to the improvement of Sanitation coverage sustainably. The characteristic of this being demand driven and based on active community participation the effect is evident in terms of a big leap in terms of IHHL coverage from 10% to 65% by the end of 2011 success attributed to Total Sanitation Program launched in 1999.

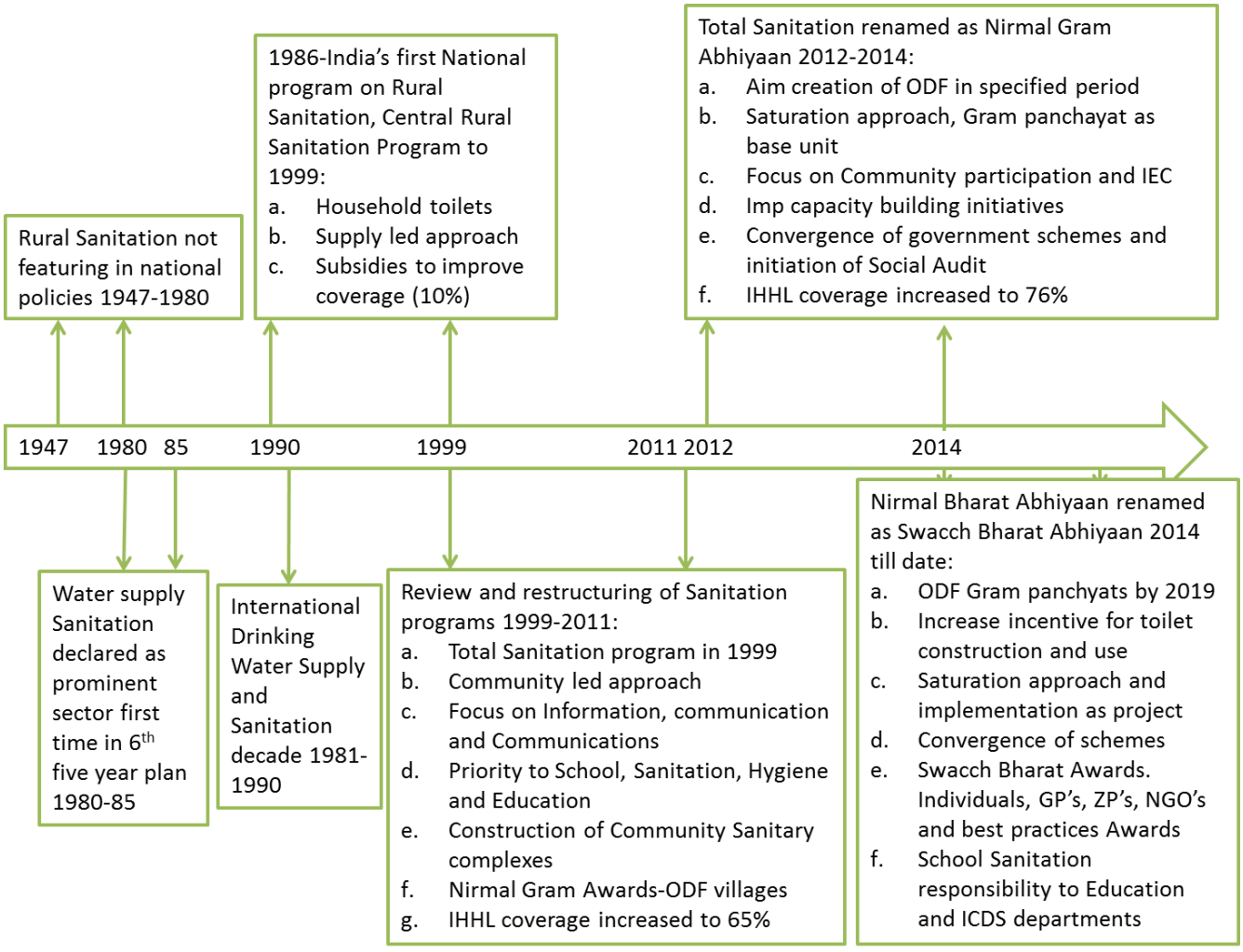

Fig. 7 Timeline of Sanitation major chronological event in India with rural focus (Based on PriMove, Unicef and WSSO 2014)

Enabling Environment:

With announcement of Swaach Bharat Campaign on 2nd October 2014 in line with the Central government's plan for Clean India Maharashtra State Government too has drafted its goals which includes Total sanitation and access to and use of safe sanitation facilities at government and community buildings, Availability of Water supply facilities Swacch

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Bharat (Total Sanitation) and environmental management of Solid and Liquid waste. Authors would like to draw out observation suggesting the environment is better enabled for achieving the goal of descent and safe Sanitation for all. The 2 main components being Financial support for Start-ups in Sanitation, IEC for behavior change, Capacity building, Construction of Individual household latrines, Sanitation material with Rural Sanitary Marts, Revolving funds to Societies and Self-help groups for further funding toilet construction, Micro financing for construction of toilets, Community Sanitary complex, Equity and Inclusion and Solid and Liquid Waste Management. The second component of enabling environment is the motivated and empowered Institutional arrangements at State with State SBM Apex committee and Directorate, State level scheme sanctioning committee & Key Resource Organization, District- District SBM Management Committee, & District KRC, Blocks-Block Program Management Unit & Cluster level Units (70-75 Gram Panchayats) and Gram Panchayat Level- Village water and Sanitation Committee, Swacchata Doot/ Sena (Cleanliness Soldiers). The incentive for toilet construction has already been increased to an amount of Rs. 12,000 per household toilet been constructed (PriMove, Unicef, WSSO, 2014).

Open Defecation Elimination Plan:

Community led total Sanitation (CLTS) a behavior change intervention has been credited to be developed by Kamal Kar from Bangladesh in 1990's in response to challenges and drawbacks of Supply led Sanitation programs initially started for small rural villages with socially homogenous populations (Kar and Chambers, 2008 as cited in Sigler et. al. 2014). It is method empowering the communities to take on their own the initiatives and arrive at own solutions. It as a method draws inspiration from Participatory Rural Appraisal but forceful in terms of message it gives and enlightenment brought to the audience in regards to open defecation which makes it distinct from other triggering the behavioral change, goal being achieving ODF status and not just building latrines (Noy and Kelly, 2009). CLTS spread widely throughout the World as preferred approach for improving Sanitation however, the forms varied with changes made as per local needs viz. subsidies given followed by toilet construction and application to urban settings ((Noy and Kelly, 2009; Gupta, 2012; Bawa and Ziyok, 2013; Mwanzia and Misati, 2013; Ogunjobi et al., 2013). The technique is firmly grounded in behavioral change theories like Theory of Reasoned Action, Theory of Planned Behaviour, Social Comparison and Cognitive theory, Transtheoritical model, Health Belief Model, Control Theory, Operant Conditioning (Silgera et. al. 2014).

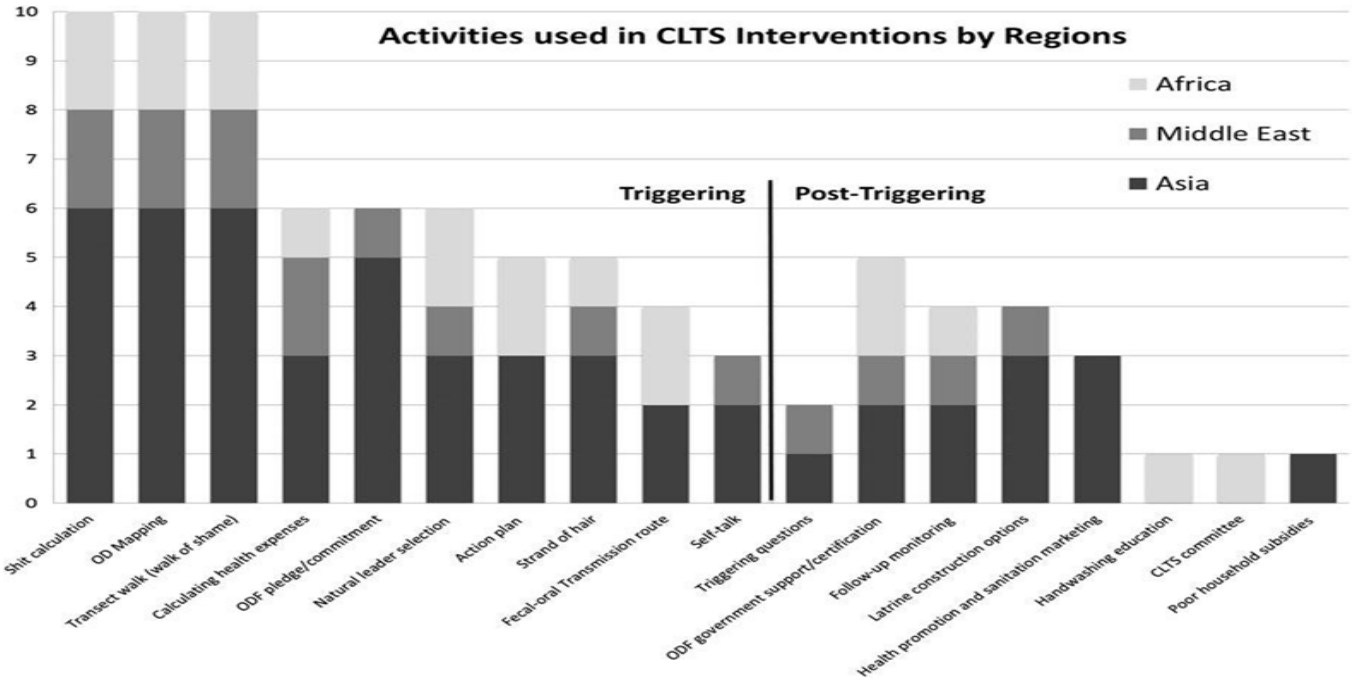

Fig. 8 Activities conducted in CLTS program by Region (Silger et. al., 2014)

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Objectives:

1. The current research focuses on understanding implementation of ODEP and post ODF sustenance for Chankapur Village, Nashik District, Maharashtra State, which achieved ODF status in 2 months

2. Overview of Participatory Rural Appraisal for 9 villages in Palghar District, Maharashtra

3. Longitudinally study the ODEP implementation for these 9 villages in collaboration with ISKCON, Unicef, WSSO

4. To draw futuristic plans for Monitoring and Governance of Villages post ODF status employing technologies like m-Audit, GIS and Big Data

Research gaps identified:

Vast literature review has very well documented from different parts of the World the success stories as cases of Community led total Sanitation employing participatory approaches however as remarked by Sigler, Mahmoudi and Graham (2014), there is very less monitoring and follow up post triggering what to talk about post ODF declaration for villages and suggest need of empirical studies to determine which behavioral change activities are most effective at ending Open defecation and sustaining it and better indigenous Sanitation solutions which are low cost, sustainable an decological. The empirical study of sustenance part of Sanitation post ODF declaration will be highly critical. The authors aim to achieve this with Chankapur village longitudinal study. As well as closely study process of PRA and ODEP implementation for the 9 villages in Palghar District to understand which behavior change strategies and implementation processes are more effective. This study will also lay foundation for draft of Monitoring mechanisms which is conspicuously minimal presently.

Participatory Rural Appraisal for 9 Villages from Palghar District, Maharashtra State, India:

Baseline survey using PRA technique becomes the foundation for the developmental interventions to follow. Authors are coordinating for the Sanitation improvements with Governmental and Non-governmental organizations involved in the project. The proposed project will cover about 9 villages (35 hamlets) around Galtare in Palghar District. Methodology used was Participatory Rural Appraisal comprised of Focus Group Discussions, Resource Mapping, Transact Walk through the villages. Two FGD were undertaken in each of the villages consisting of 20-25 persons consisting of representative of Panchayat, Farmers, Youths and Women.

Demographic Information:

Table 2: Demographic overview of targeted villages

SN	Particulars	Number
1	Number of Villages	9
	Number of Hamlets	35
2	Number of Households	2,163
3	Populations	11,893
	Male	6118
	Female	5775
4	Number of Landholding Families	1,853 (86%)
5	Average Land Holding	1.5 acres
6	Number of Landless Families	310 (14%)
7	Number of Handicapped Persons	42

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Table 3: Village wise demographic information

SN	Village	Population			Number of House Holds	Family size
		Male	Female	Total		
1	Amgoan	1498	1541	3039	276	11.0
2	Galtare	1009	901	1910	365	5.2
3	Ghore	1188	1115	2303	511	4.5
4	Guhir	499	435	934	197	4.7
5	Hamrapur	493	342	835	218	3.8
6	Kuntal	257	231	488	116	4.2
7	Kurla	242	191	433	86	5.0
8	Nane	567	642	1209	237	5.1
9	Sange	365	377	742	157	4.7
	Total	**6118**	**5775**	**11893**	**2163**	**5.5**

Table 4: Families below poverty line

SN	Village	HH	BPL	% BPL
1	Amgoan	276	133	48.2
2	Galtare	365	243	66.6
3	Ghore	511	168	32.9
4	Guhir	197	92	46.7
5	Hamrapur	218	92	42.2
6	Kuntal	116	111	95.7
7	Kurla	86	46	53.5
8	Nane	237	127	53.6
9	Sange	157	137	87.3

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	Total	**2163**	**1149**	**53.1**

Table 5: Number of Families surveyed from villages

SN	Village	Total Families surveyed	Tribe		Total Family members	Children	
			M koli	Varli		Boys	Girl
1	Amgoan	21	5	16	118	26	24
2	Galtare	64	64	0	253	67	44
3	Ghore	36	34	2	163	44	24
4	Guhir	19	19	0	74	17	18
5	Hamrapur	27	25	2	121	36	22
6	Kuntal	18	18	0	66	21	11
7	Kurla	5	5	0	22	8	4
8	Nane	5	5	0	23	5	6
9	Sange	11	11	0	45	11	13
	Total	206	186	20	885	235	166

Table 6:Distribution according to Type of houses in these villages

SN	Village	Total Families surveyed	Pakka House	Kachha House
1	Amgoan	21	**20**	**2**
2	Galtare	64	**5**	**59**
3	Ghore	36	**21**	**16**
4	Guhir	19	**3**	**16**
5	Hamrapur	27	**11**	**16**
6	Kuntal	18	**7**	**9**
7	Kurla	5	**5**	**0**
8	Nane	5	**1**	**4**

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9	Sange	11	**3**	**8**
	Total	**206**	**76**	**130**
		%	**36.89**	**63.11**

Table 7: Amenities available in households

SN	**Village**	**Total Families surveyed**	**One Room**	**2 to 3 Rooms**	**Bathroom/toilets**
1	Amgoan	21	**0**	**21**	**2**
2	Galtare	64	**16**	**48**	**2**
3	Ghore	36	**16**	**21**	**7**
4	Guhir	19	**5**	**14**	**3**
5	Hamrapur	27	**10**	**16**	**7**
6	Kuntal	18	**7**	**11**	**2**
7	Kurla	5	**1**	**4**	**2**
8	Nane	5	**2**	**3**	**0**
9	Sange	11	**5**	**6**	**0**
	Total	**206**	**62**	**144**	**25**
		%	**30.1**	**69.9**	**12.1**

Table 8: Other Facilities in Houses

SN	**Village**	**Total Families surveyed**	**Cycle**	**Motor bike**	**Bed-Iron/Wooden**	**Table/Chair**	**Cupboard**	**Radio/TV**	**Jewelry**
1	Amgoan	21	**5**	**7**	**1**	**19**	**1**	**1**	**0**
2	Galtare	64	**18**	**8**	**22**	**44**	**24**	**33**	**1**
3	Ghore	36	**3**	**6**	**1**	**20**	**0**	**7**	**0**
4	Guhir	19	**5**	**6**	**4**	**13**	**2**	**8**	**3**
5	Hamrapur	27	**8**	**5**	**0**	**16**	**0**	**3**	**0**
6	Kuntal	18	**3**	**3**	**0**	**10**	**0**	**3**	**0**
7	Kurla	5	**4**	**0**	**1**	**5**	**0**	**0**	**0**

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8	Nane	5	**0**	**1**	**1**	**4**	**0**	**0**	**0**
9	Sange	11	**4**	**3**	**0**	**5**	**0**	**0**	**0**
	Total	**206**	**50**	**39**	**30**	**136**	**27**	**55**	**4**
		%	**24.27**	**18.93**	**14.56**	**66.02**	**13.11**	**26.70**	**1.94**

Table 9: Literacy rate in Selected Villages

					Illiterate			
SN	**Village**	**Members**	M	F	**Male**	**Female**	**Male Child**	**Female Child**
1	Amgoan	**118**	**60**	**58**	**18**	**23**	**13**	**5**
2	Galtare	**253**	**139**	**114**	**21**	**31**	**18**	**23**
3	Ghore	**163**	**89**	**74**	**12**	**27**	**16**	**9**
4	Guhir	**74**	**36**	**38**	**4**	**9**	**2**	**5**
5	Hamrapur	**121**	**67**	**54**	**15**	**23**	**9**	**7**
6	Kuntal	**66**	**39**	**27**	**8**	**14**	**6**	**3**
7	Kurla	**22**	**13**	**9**	**3**	**3**	**2**	**1**
8	Nane	**23**	**11**	**12**	**1**	**2**	**1**	**0**
9	Sange	**45**	**22**	**23**	**6**	**5**	**4**	**4**
	Total	**885**	**476**	**409**	**88**	**137**	**71**	**57**
		%	**53.79**	**46.21**	**18.49**	**33.50**	**17.36**	**13.94**

Open Defecation Elimination Planning as followed at Chankapur (PriMove, Unicef, WSSO, 2014):

ODEP is a continuous process employing community participation for conducting participatory assessment of status, identification of issues, finalization of solutions and planning for sanitation facilities and results into Open Defecation Elimination Plan and Behaviour Change Communication Plan.

1. The process starts with preparation to be done prior and during the process. Preparations start with issuing written instructions to village functionaries regarding dates of the process, participants, preparation to be done by Gram panchayat etc. This is followed by Village level pre planning meeting to ensure smooth facilitation of the process by ensuring an active participation of the members. After the meeting the SBM baseline survey data is collected, followed by classification of families on the basis of habitations in order to understand the status of Sanitation in relation to Individual House Hold level Latrine's, Institutional Sanitation and Solid and Liquid Waste Management. The material like card sheets, markers, sketch pens etc is purchased and kept beforehand ready for the process.
2. There are 8 sessions conducted over 4 days as part of the process.

Day 1	Day 2
Session 1	Session 5
Preliminary meeting with Villagers	Sanitation Transect
Session 2	Documentation of the process

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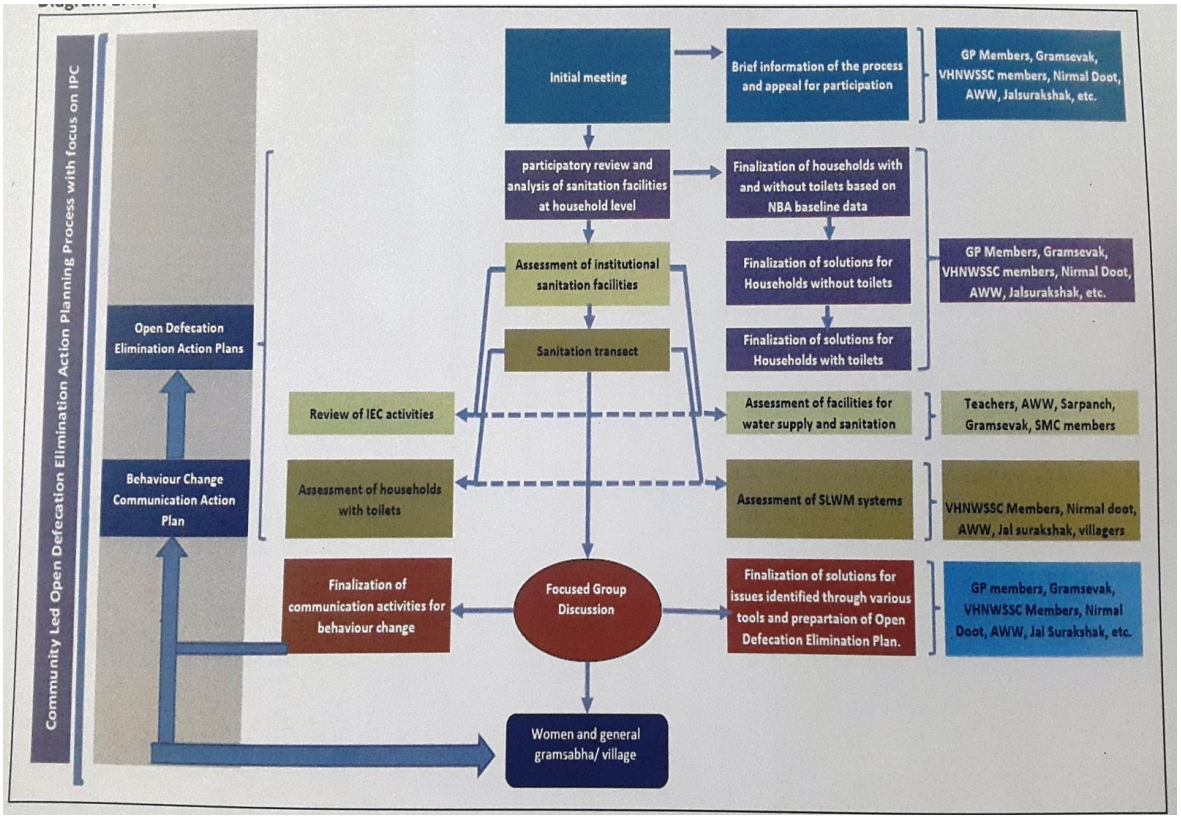
Participatory Review and Assessment of Sanitation facilities at Household level	Session 6
Session3	FGD- Preparation of Communication plan for implementing ODE
Assessment of Institutional Saniattaion	Session 7
Session 4	Draft of ODE Action Plan
Documentation of the process	Session 8
Mashal Pheri/film show on Water Supply Sanitation	Preparation for Gramsabha- Village Walk, Corner Meetings
	Presentation and approval of the plan in Women's and general gramsabha

Fig. 10 ODEP Implementation Plan



(PriMove, Unicef, Unicef, 2014)

Methodology:

The data was collected with the help of a series of interviews with Swacch Bharat Committee Chairman, Principal Secretary – Ministry of Drinking Water and Sanitation, Governmental Officers from Water Sanitation and Support Organization, Unicef, SBM Block level Management Committee, Gram Panchayat representatives and Villagers. A semi structured interview schedule was used to collect data.

Dr. Raghunath Mashelkar (Swacch Bharat Committee Chairman):

Government of India created Technology Expert Committee for Drinking Water and Sanitation. Being a leading Scientist, he is Chairman of Committee working on effective, sustainable, low cost Sanitation solutions. He graphically mentions SBM as one more freedom movement for freedom from filth. The SBM total cost is going to be Rs. 120

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billion, but he remarks the cost of not doing it is higher than this. He remarked that the technology should also be easily scalable for implementation across vast expanse of India considering the differences in socio-geographic conditions as 120 million toilets are to be built in short span till 2019. The committee has been trying not only incremental but disruptive innovation which could be real game changer seeking next practices and more from the perspective of Inodvation. Indovation series of two days exhibition cum discussion event is organized inviting the Principal Secretaries and other officials of individual states. Today around 50,000 toilets are being built every day but emphatically he remarked it's not just about building the toilets it's about using the toilets, thus calls in the involvement of Social Scientists too. He expressed his happiness about the speed with which the message is spreading about SBM but expressed his delight recalling incident of a School girl from Goa region expressing ownership of this mission bringing in his conclusion Society children can be agents of transformation. Lastly he ended with the message that through the People Movement SBM can make India Clean as when India is determined India Can and India Will.

Mr. Rajesh Kumar, Principal Secretary- Drinking Water and Sanitation- Maharashtra State:

He remarked that the Sanitation technologies developed should be acceptable by People too and for this purpose the government has plans to build Sanitation parks from which the community can choose from a range of approved and preferred Sanitation technologies and not just make one Sanitation technology like a two pit system compulsory for all, by including other technologies like biodigesters etc. There are various success stories from Maharashtra State and as a state it has been in leading position in improving the Sanitation status. In case of Liquid waste management, Tembhurne (Nanded District) village's Sarpanch has designed indigenous Soak pit system which has led to situation where there is not a single mosquito in that village and improved water tables too. This is being adopted now in around 1000 villages. All of these technologies need to be essentially low cost as people are reluctant to contribute their part financially, but in some cases villages went on for costlier technologies like biodigesters. At District levels Apps are available with details about the Supplier profiles, Masons and their profiles for smooth construction of toilets. Involvement of Village will be must for Sanitation planning and monitoring for improvement of Sanitation. He also narrated the ODEP plan. In relation to implementation of m-audit technology for monitoring he mentioned about an experiment in a village in Maharashtra which has already got this technology in place working closely with Unicef.

Mr. Sawai, Director, WSSO, Maharashtra:

He spoke much on same lines as the principal secretary, talked about the two pit system widely being available as the low cost solution in India which has given excellent results considering the socio-geographic condition and the costing criteria. He also talked about the success of several cases like Tembhurne etc. He specifically remarked about the need to effect the behavioral change too and mentioned that its possible with a powerful ODEP plan being in place now.

Mr. Kumar Khedkar, Information, Education, Communication Officer, WSSO, Maharashtra:

He shared several important documents like ODEP plan training manual, Sanitation Technology guidebook, Collection of Success stories, a tool kit containing various Educational entertainment filled games improving Sanitation related awareness and sensitivity. He step by step explained the ODEP process with reference to the case of Chankapur village from Nashik District and invited to attend ODF celebration to better understand the process practically. ODEP in Maharashtra is a collection of several activities as is evident from the Fig. 2 by Silger et. al., 2014. It starts with the baseline survey and validation process for the data available, first sensitization with the hair strand activity and triggering questions are put forth helping understand the health impact of practicing OD, followed by Open defecation mapping, however, this is done in a very traditional manner with the help of Rangoli painting. This is followed by Transect Walk also called as Walk of shame, this again has been applied very uniquely involving children from villages who join for this walk giving roses to people practicing OD as a request not to do so and taking away the utensils they use for carrying water for OD. Post this FGD is called where the people are asked why they practice OD, this is followed by second part of transect walk where the Houses are labeled either as green with functioning toilet, Saffron- if with defunct toilet and Red- if with no toilet. This is followed by ODF pledge and commitment from each family representing each household from the village. A gramsabha is called in which with participation ODEP Action plan is drafted and the target date is finalized by when the village agrees to get ODF. Village Gram panchayat representative along with the Block Management Committee drafts the technical plan for building toilets and monitoring the

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construction, the community participation is crucial here too involving the masons from the village, getting material for construction at cheap rates, monitoring the speed as against the target, dealing with challenges if any and finally the ODF celebration. Post ODF declaration there is Committee is established to monitor it further.

Inteverviews at Chankapur:

Mr. T.T. Sonawane, Block Development Officer- Kalwan, Nashik, Maharshtra

The government support is available but success comes only with Community participation and involvement of village represnetatives. If they decide ODE is possible. He remarked that the ODEP is very powerful program and has led to ODE in just 2 months for the village of Chankapur.

Mr. S.H. Jadhav, Additional BDO- Kalwan, Nashik, Maharshtra

We are working at a great speed for ODE and its possible with support from NGO's like Unicef, WASH etc.

Mr. R.U. Mahajan, Gram Sevak

He said the village totally transforms post ODEP process. Same people who challenged first become supportive later.

Mr. Chetan Hire, Mr. Sachin Muthe, Mr. Hiralal Gaikwad, Mr. Vimal Thakare - Block coordinators

It's a laborious thing too getting toilets constructed and monitored but it also is reason for the success of ODEP as the stakes are invloved.

Mr. Gnyandev Pawar- Sarpanch, Mrs. Kamal Pawar-Assistant Sarpanch, Mrs. Kusum Pawar, Mr. Ramchnadra Bhoye, Mrs. Bharati Pawar, Mr. Tulshiram Gaikwad-GP members, Ms. Kajal Dhumse-children represnetative, Chankapur, Nashik.

It is highly essentail that villages get ODF as this will determine if they continue to get benefit under various governemental schemes as getting ODf status is necessity first. They all could achieve ODF status for village because they understood the importanec of hygiene and proper sanitation. Very important point brought to discussion was about the ovecoming of major challenge for women who don't have access to proper Saniation facility with toilet construction. It was the unity of the villagers and the empowerment of Self Help Groups who educated women folks which which led to success. While discussing about some drawbacks, the Village chief of GP mentioned there is need to relook into the definition of a family below poverty line as household with a TV set and Motorcycle is denied all the benefits as they are not considered BPL in spite of havinh low income. Further a critical point of discussion emerged that for success of any scheme owning of the initiative is a must on the part of the beneficiary, this will happne only when something is at stake, either financial partnership or labor partnership is a must which will determine the involvement and in turn the success. Nothing should be given 100% free. If the mindset within changes the change outside will be evident.

Conclusion:

In conclusion, Participatory Action Research (PAR) emerges as a powerful approach for promoting sustainable sanitation practices in India. By engaging stakeholders and involving communities in the research process, PAR enables the identification of context-specific solutions and empowers individuals to take ownership of their sanitation behaviors. Through case studies and empirical evidence, it has been demonstrated that PAR can lead to tangible improvements in infrastructure, sanitation behaviors, and overall community well-being. However, challenges such as power dynamics, resource constraints, and long-term sustainability must be addressed to ensure the effectiveness and longevity of PAR initiatives in the sanitation sector. Nevertheless, the participatory nature of PAR fosters inclusive decision making, knowledge co-creation, and transformative social change, making it a valuable research method for advancing sustainable sanitation practices not only in India but also in similar contexts worldwide. Continued exploration and application of PAR in the sanitation sector can contribute to the achievement of Sustainable

Development Goal 6, ensuring access to clean water and sanitation for all, and ultimately improving the quality of life and well-being of communities.

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