Title: Role of local actors in WASH (water, sanitation and hygiene) during disaster recovery: Policy implications from evidence in Odisha, India

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Abstract

There is a paucity of empirical insights on how existing policies in disaster recovery and water, sanitation and hygiene (WASH) play out during disaster recovery in the Global South. This paper addresses this critical gap using the case study of 2013 Cyclone Phailin in Odisha. The data was collected through participatory and learning action tools and semi-structured interviews with key informants. This study found pervasive exclusion of women and local actors from recovery decision-making. The policies and guidance at national and subnational level lacked clear emphases on roles and responsibilities of the local governments, and did not emphasise their role in setting recovery objectives and priorities. We conclude that existing policies should emphasise immediate as well as longer-term WASH needs, adopt a multi-hazard perspective in preparedness and WASH policies, and feature WASH during recovery in the existing manuals, policies and programmes.

Keywords: policy analysis, disaster recovery, water, sanitation and hygiene

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1. Introduction

Strengthening of national and local capacities for disaster risk management is a foundational theme within the movement toward disaster risk reduction, articulated strongly within the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNISDR, 2015). The strategic push in disaster recovery has leaned towards heavy reliance on top-down government-centric solutions and capacity enhancement of state political and administrative capacities and resources (Oxley, 2013). Yet, the practical aspects, the “how-to” engage and empower local actors and empower women, are areas that humanitarian agencies continue to struggle while designing recovery plans.

The impact of disasters on progress of water supply, sanitation development, subsequent policy revisions and role of local actors during recovery is an under-researched area. The role of local actors, including the position of women and other vulnerable groups during recovery, is an issue under-exposed in literature. This paper provides an on-the-ground assessment of this phenomenon, which is a potentially valuable contribution to the literature. It elaborates on how local actors, including local governments, engage and lead disaster recovery operations, and participate in water, sanitation and hygiene (WASH) programmes. It also investigates women's roles during recovery, and their participation in WASH during recovery. This article addresses this knowledge gap on how such relevant policies play out in on the ground processes of disaster recovery using empirical evidence. The aim of this research is to contribute to insights about effective disaster recovery in the global South by undertaking a case study research of disaster recovery in Odisha, India.

The article asks, "*How do existing policies in water, sanitation and hygiene (WASH) and disaster management enable local actors and women to take action during recovery? Furthermore, how can these policies be strengthened and translated into practice effectively?"* This paper will explore approaches that include local actors, organisations and women in sustaining WASH behaviour change using a case study from 2013 Cyclone Phailin in Odisha, India. Cyclone Phailin and subsequent floods in 2013 had affected 12 million people directly or indirectly (Dash, 2013). To achieve the research aim, the following steps were taken: a) developing a guiding analytical framework through review of literature; b) undertaking a case study of 2013 Cyclone Phailin in Odisha using mixed methods and c) analysing and discussing empirical findings in light of existing policies and drawing conclusions for wider implications.

2. Background and context

This section reviews two bodies of literature – disaster recovery studies and on post-disaster WASH – to provide analytical guidance for the empirical research.

The current structure of the humanitarian aid system has few incentives for engaging local actors and organisations. Instead the humanitarian sector's power dynamics, culture, financing and incentive structures create compelling reasons to remain closed and centralised and averse to innovation, learning and transformation (Bennett, 2016). Spiegel (2017) calls for a major revision of humanitarian leadership and coordination of humanitarian emergencies, aiming for "minimal, efficient, and context-specific coordination, with fewer processes and meetings, that leads to differentiated and effective responses and saves lives" (p.17). There have been numerous studies evaluating government-NGO coordination, NGO-NGO coordination, cluster approaches and consortia models for coordination (Clarke & Campbell, 2018; Krishnan, 2017; Raju & Becker, 2013). During recovery from the Indian Ocean Tsunami, engaging local actors was found to be challenging and time consuming, yet vital for removing the confusion stemming from the rush of aid organizations – not least international NGOs – to the affected areas, stepping on each other's toes with lack of coordination (Christoplos, 2006; Telford et al., 2006). Research from Pakistan shows how incentivizing from donor organisations has led to break-down of community-driven action because cultural expectations that the community will have near-exclusive local control over decision-making and resource allocation are weighted against top-down decisions over distribution and entitlement, thereby eroding the legitimacy and accountability of local organisations (Bano, 2012).

Globally, studies have highlighted the role of local actors and social networks in the recovery process as either an enabling aspect or reinforcing barriers to vulnerable groups (Aldrich, 2011; Rahill et al., 2014). Twigg & Mosel (2017) draw attention towards emergence –

spontaneous responses by self-organising, voluntary groups and individuals – who undertake search and rescue, transport and distribute relief supplies, and provide food and drink to victims and emergency workers. These emergent groups form part of the social capital, and have a large role to play during recovery. In coastal Andhra Pradesh, Bosher (2005) found that the 'lower' castes being the most marginalised, powerless and poorest members attempted to address their marginalisation by accessing socio-economic resources such as social networks – civil society institutions such as NGOs, CBOs and informal kinship networks – to increase their resilience to frequent small-scale crises. In coastal West Bengal, local networks along with community leaders and local administration played an important role in reducing risk during and after cyclones, and played a larger role in social reconstruction processes (Misra et al., 2017). After cyclone Aila in 2009, youth club members, women's self-help groups (SHGs), farmers' cooperatives, fishermen groups, and other business cooperatives consisting of shop owners and businessmen provided common networks, thus enhancing the social capital (Sanyal & Routray, 2016).

Women are often categorised as individuals vulnerable to disasters (McEntire, 2012), although evidence from post-tsunami Eastern Sri Lanka indicates that pre-existing gender relationships, entitlements, networks with local NGOs, and relationships with local authorities distributing post-disaster aid have positively influenced gendered recovery (Thurnheer, 2009). Sanyal and Routray (2016) found that women, acting as part of self–help groups (SHGs), were instrumental in empowering each other, bringing other women in the community closer, aiding cash flow with bank linkages and internal lending, as well as information flow through their networks. A study examining the outcomes of community-led approaches in post-tsunami Aceh found that livelihood interventions needed to fit with clearly identifiable local networks, structures and practices if they hoped to succeed, as projects that did not build on local networks tended to fall over when the NGO staff withdrew (McCarthy, 2014). Sultana

(2010) draws from an analysis in Bangladesh of the gendered dynamics of floods and disasters, as well as of interventions, to demonstrate the differential and gendered implications of both water-related hazards and the structural interventions that were envisioned to address the hazards. Using evidence from multiple disasters that affect Odisha, Ray-Bennett (2009b) found that women demonstrated their individual and collective agencies in order to meet their cultural and biological needs under severe crisis. The idea and practice of women's empowerment in the Indian context, has degenerated into a set of largely apolitical, technocratic, and narrow interventions that create nothing like the radical transformation envisaged by early women's movement leaders (Batliwala, 2007). Challenging the specific gendered meaning, Batliwala (2007) proposes women's empowerment as the transformation of the relations of power between men and women, within and across social categories of various kinds.

Despite operational efforts, the evidence of roles played by local actors and networks for effective WASH behaviour change during recovery is scant. It is important to assess the extent to which existing policies cater to the contextual and programming challenges of recovery, including demographic changes, returning populations, integration of displaced communities with host communities and resettlement to safer locations (Wisner & Adams, 2002). We refer to the "humanitarian aid system", which includes donor organizations like UK AID and the European Commission's Humanitarian Affairs and Civil Protection Department (ECHO); international NGOs like Oxfam, Christian Aid and Save the Children; national government agencies like Public Health Engineering, Water Resources, Sanitation, Rural Development, Revenue and Disaster Management, Land Resettlement and Rehabilitation that are involved in different aspects of water, sanitation and disaster management; subnational NGOs like Society for Leprosy Amelioration & Rehabilitation (SOLAR) in Puri, United Artists' Association

(UAA) in Ganjam and UNNAYAN in Balasore. The consortium approach in Odisha, and challenges with inter-agency coordination, have been described elsewhere (Krishnan, 2017).

3. Methods

3.1 Sampling strategy

Oxfam's Cyclone Phailin and flood response in Odisha was used to gain a critical perspective on the differences in WASH practices and recovery processes across different villages, and the impact of agency support on recovery. Government's programmes and policies in Odisha were analysed in light of empirical findings from Puri and Balasore districts, which were affected by cyclone and floods respectively during the cyclone (See Figure 1).

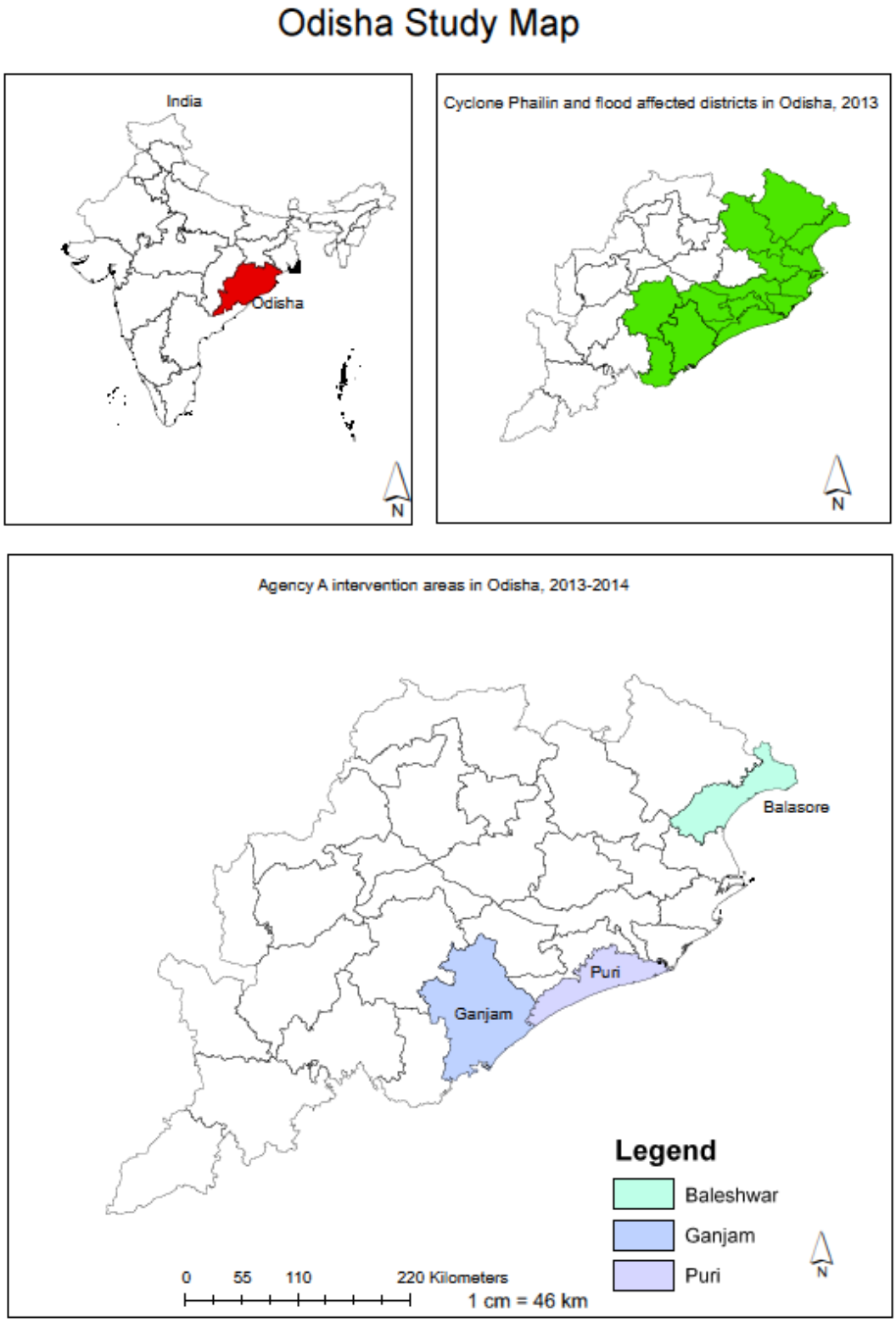

Figure 1: Study map of districts affected by Cyclone Phailin and floods in 2013 – Puri, Ganjam and Balasore, which were also Oxfam's intervention areas

Data was collected from 13 villages – 8 from Puri and 5 from Balasore, where Oxfam had intervened. One of the villages in Balasore – Chandanamkhana – was also affected by erosion, as the river washed away the homestead land and farmland in the village. Data collection in these villages reflected the changing dynamics in the response programme, and responded to the emerging community needs. It followed an iterative and inductive approach.

3.2 Data collection tools and analysis

The first author worked in Puri from October 2013 – March 2014 with Oxfam and visited Balasore in March 2014, 6 months after floods had affected the district. The data gathered and reported in this article were collected using participatory learning and action (PLA) tools and semi-structured interviews with key informants. PLA tools included generating actor maps, undertaking transect walks and focus group discussions (FGDs) (Mikkelsen 2005 p.63). Separate FGDs were held with women, men and children, and with elderly or disabled members, where appropriate and feasible. 43 group discussions were held in 10 sites. An actor map was generated after these discussions, regarding the sources of information and networks that the respondents relied upon. 10 semi-structured interviews were held with adult females in the households and 36 interviews were conducted with key informants such as NGO staff, village leaders, panchayat (local government) officials, government officers, and schoolteachers. The first author conducted the interviews in Odia, the local language and recorded audio with permission from the respondents. She undertook manual transcription, coding and analysed the data reported here. She analysed interview data and field notes using mindmaps and a Framework approach (Gale et al., 2013). The Framework method is a systematic and flexible approach to analysing qualitative data, especially for inductive, thematic analysis of semi-structured interview transcripts, and involves rigour, reflexivity and ensures quality. Following this approach, the first author manually coded emerging themes, and then mapped relevant portions on roles, capacities and opportunities for local actors and

processes of gendered recovery and wrote up descriptions along these themes for inclusion in this paper.

3.3 Ethics

The study followed official (and necessary) procedures as per the Ethical guidelines at University College London and complied with the UK Data Protection Act 1998 ll. It adhered to ethical principles of informed consent and sensitivity in questioning people affected by disasters, and maintained their anonymity and privacy (Few et al. 2013 p.49). We took verbal consent from all the participants of focus groups and household interviews, and obtained written consent from key informants who agreed to participate in the study. No compensation was paid to any of the study participants. We recorded all names and kept these in a data protected sheet, while maintaining physical forms in secure storage. Only the first author had access to both. This research was sensitive to the ethical issues of working in a disaster situation: efforts were taken that their participation did not exacerbate their vulnerability or pose further difficulties.

4. Findings

Thematic analyses of qualitative data and interpretation of gaps in existing policies have been organised to understand the types and extent of local actors involved in post-disaster recovery in WASH, the opportunities and limitations of involving these actors and networks, and relevant policy implications.

4.1 Study setting and context

In India, there is strong focus on WASH and DRR sectors in existing government policies and schemes, such as Disaster Management Act (2005; revised 2016), National Rural Water

193 Drinking Programme, and Swachh Bharat Abhiyan (2014)[1]. 33% membership is reserved for
194 women in formal institutions and government bodies related to water and sanitation
195 (Routray et al., 2017). Odisha faces multiple hazards such as floods, cyclones and droughts, as
196 well as poverty, unemployment, and low per capita income (Ray-Bennett, 2009a). It has the
197 lowest level of household toilet access in India: an 84.7 per cent open defecation rate (MHA,
198 2011 cited in Mommen and More, 2013). Between 1993 and 2011, toilet coverage in Odisha
199 increased from 1.4 per cent to 14 per cent – an annual increase of around 0.7 per cent
200 (Mommen and More, 2013).

201 **4.2 Role of local actors, institutions and other stakeholders**

202 The actor maps generated during the FGDs provided useful information about various forms
203 of support received during disasters by the local actors. Table 1 presents a typology of actors
204 involved post disasters in Puri and Balasore.

[1] Swachh Bharat Abhiyan, re-launched in 2015 is a national flagship program which aims to completely eliminate open defecation in India by 2019 through construction of household toilets and emphasizing village cleanliness campaigns.

Table 1: Type of actors involved in WASH and recovery in Puri and Balasore

Type of actors	**Puri cyclone-affected villages**	**Balasore (flood and erosion-affected villages)**
Local service providers	School/Anganwadi teacher Community health workers (ASHA, ANM) Village Water and Sanitation Committee members	School/Anganwadi teacher Community health workers (ASHA, ANM) Women's cooperatives
Local government institutions	Ward Member Panchayat President Member of Legislative Assembly	Ward Member Panchayat President Block Officer Member of Legislative Assembly
Government line departments	Public Health Department & Public Health Engineering Department officials Odisha State Disaster Management Authority	District Water and Sanitation Mission Revenue Department
Non-governmental actors	Oxfam India & SOLAR NGO	Oxfam India & UNNAYAN NGO
Community based organisation	Youth Facilitators Masonry groups	Self Help Group (SHG) members Youth groups Local businessmen and traders

Local service providers: after the cyclone the local education and health service providers played a crucial role in hygiene behaviour changes at the community level. They formed an interface with humanitarian agencies including Oxfam and Action Aid, who were working in schools and health centres to promote awareness on hand washing, safe defecation practices and prevention and response measures for diarrhoea and other water-borne diseases. School teachers and government frontline workers such as Accredited Social Health Activists (ASHA), Anganwadi workers and auxiliary nurse midwives (ANMs), all locally hired female members, were part of community hygiene promotion campaigns. Oxfam incorporated the existing committee members from Village Water and Sanitation Committee into post-disaster village-level WASH committees for construction of shared latrines and communal bathing units. For instance in Gopinathpur, Puri, the existing committee had received government training and funds prior to the disaster:

219 *"The members of the Village Water and Sanitation Committee play a key role in the*
220 *implementation of the government sponsored sanitation development programmes*
221 *[Swachh Bharat Abhiyan]. They participate in mason training, have access to funds for*
222 *setting up a rural sanitation production centre that produces sanitary slabs and mats."*
223 *(KII, 2, 2013)*

224 Oxfam and local NGOs provided shared family latrines for immediate access in 6 villages. For
225 provision of materials and construction of latrines, the local household members relied on
226 local masons; and they relied on ward members for enlisting their names for awarding
227 financial support as per the Swachh Bharat Abhiyan scheme as instalments for the latrines.
228 Across coastal villages in Krushnaprasad block, school and Anganwadi teachers engaged with
229 children on hygiene education programmes conducted by the NGOs in their village. There
230 were sport activities, handwashing demonstrations, games and competitions for students to
231 promote safe hygiene behaviour.

232

233 *Community based organisations and Local NGOs:* After the 1999 Supercyclone, the civil
234 society organisations had come together to form pre-disaster preparedness networks in both
235 the districts consisting of local NGOs, community based organisations, women's self-help
236 groups and cooperatives. In Cyclone Phailin these networks were activated again. As soon as
237 the media circulated warnings, Oxfam, along with its local partner NGOs – UNNAYAN in
238 Balasore, United Artists Association (UAA) in Ganjam and Society for Leprosy Amelioration &
239 Rehabilitation (SOLAR) in Puri – deployed rescue boats and mobilised contingency stocks from
240 their warehouses, such as tarpaulin sheets and hygiene kits, in all three districts. Community-
241 based organisations led the mobilisation and search and rescue activities in the villages. An
242 official from a local NGO reported,

243 *For us, community resilience can be achieved through community-based*
244 *organisations, and groups, by strengthening their capacities, and encouraging them*

to work closely with women [...] Livelihoods and improving productive assets is equally important during recovery. For this, organisations have to build new or strengthen existing community-market access (KII, 3, 2014)

In Puri, Gopinath Juvak Sangh, a youth network, collaborated with SOLAR for community mobilization and activating a network of women's groups for livelihood and cash-for-work projects in the affected villages and island villages in Chilikha lake. For hygiene promotion efforts, Oxfam and local NGOs mobilised youth facilitators at the community level to impart hygiene messages with the help of village rallies, slogans, and local language messages painted as murals on walls of latrines. In Balasore, Oxfam and its partner NGO UNNAYAN launched a response programme for 3 months. UNNAYAN had already mobilised women's self-help groups (Mayurbhanj Mahila Association: MMA) and youth groups (Subarnarekha Suraksha Sena) which were functional even during 2007-2008 floods in the district. These community-based organisations (CBOs) were instrumental in ensuring displaced populations living in relief camps were provided with food packages and water supply. They also organised community kitchens in the relief camps for the flood-affected families. However, during the recovery phase the affected communities did not get any support from Oxfam or UNNAYAN as recovery efforts were focused on cyclone-affected villages. Oxfam and UNNAYAN engaged in advocacy for land allocation for erosion-affected households in Chadanamkhana village in Balasore, as government organisations had the mandate for provision of services and land allotments during the recovery phase.

Local Government Officials: The Panchayat President, or Members of Legislative Assembly were higher up in the hierarchy of legislative powers to ensure households received compensation for household damage and repair. Panchayat members, revenue circle officers and *Zilla Parishad* [2] leaders played a crucial role in the aftermath of cyclone and floods, they

[2] District Council or Zilla Parishad or District Panchayat , is the third tier of the Panchayati Raj system

mobilised communities during the cyclone, disseminated early warning messages, evacuated them to the nearest cyclone- and flood-shelters, and organised emergency food and water supplies. They are also mandated with responsibilities as per the government schemes and policies.

> *"Since Nirmal Bharat Abhiyan Programme (and recently Swach Bharat Abhiyan), sanitation is integrated under MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme) and District Drinking Water Supply (DDWS) Scheme. The officials were involved in hygiene promotion activities providing Information, Education and Communication (IEC) materials and promoting use of latrines through construction of model toilets." (KII, 2, 2014)*

Line department officers also played a crucial role in both districts. These departments and their roles in WASH and recovery are listed as follows:

- **Department of Water and Sanitation Mission**: It is a society formed of various line departments who are in-charge of monitoring and evaluation of financial and physical performance of the water supply and sanitation services. They are responsible for convergence of the various departments as mandated by national policy. For WASH services, communities relied on Department of Water and Sanitation Mission (DWSM) for financial incentives to install hand pump and latrines at the household level.
- **Rural Development Department** undertook water supply measures in rural Odisha; it houses the Rural Water Supply and Sanitation (RWSSS) to provide safe drinking water to all the coastal saline affected habitations and ensure piped water supply in villages
- **Public Health Engineering Department** is the key government body implementing national and state-level water supply and sanitation schemes and programmes

- **Odisha State Disaster Management Authority (OSDMA)** played an active role during the rehabilitation by taking proactive measures in resource mobilisation, database management, and coordination with different departments and affected districts, donors and NGOs.
- **Revenue and Disaster Management Department (R&DM)** is mainly involved with land entitlements and also provide relief compensation for households affected by natural calamities. It is in-charge of implementation of the Odisha Relief Code (ORC) during disasters (Government of Odisha 1996).

Since the revamping of the sanitation programme, there has been a larger focus on promotion and construction of latrines, and village cleanliness programmes. Yet, it emerged that the component of disaster risk reduction is largely missing. Odisha Relief Code, the only existing disaster policy document for Odisha, explicitly mentions 'sanitary arrangements' just once in the context of restoration activities post-disasters.

4.3 Local actors' capacities and activities undertaken

Table 2 characterises these localised efforts by listing the type of actors, their activities related to WASH and recovery and the challenges they faced in improving access and use of WASH systems during recovery. These are analysed to assess strengths and weakness of existing policies and schemes related to WASH and disaster recovery.

313 Table 2: Local actors, their activities in WASH and recovery and challenges faced

No	Categories	Type	Actors involved	Activities relevant to WASH and recovery	Challenges
1	Local service providers	Health	ASHA, ANM, traditional midwives	- Involved by NGOs in recovery programming-WASH training and capacity building - Provision of chlorine tablets and preventive health	- Limited human resources - Difficulties in outreach activities during disasters
		Education service providers	School and *Anganwadi* teachers	- Managing School WASH committees set up by the NGOs - Awards for best students in cleanliness awareness of handwashing, nail cutting - Schools act as first space for hygiene education	- Limited resources in schools affected by disasters themselves - Primary focus is on education - Lack of maintenance of school facilities
2	Government bodies	Three –tier governance (Zilla Parishad, Block and Gram Panchayat)	Revenue Circle officer, Ward Member, Panchayat President	- Relief provision to displaced households - Damage assessment and compensation with the district administration - Allotment for schemes on housing, handpumps and latrines - Land allocation for erosion-affected households	- Limited role and mandate for recovery solutions - Lack of coordination and guidelines for recovery for local govt officials - Unclear role in longer-term recovery -
		Line Department	DWSM official, Rural Development Department, Health Officers Public Health Engineers and R&DM officials	- Damage assessment and allocation of subsidies for household latrine construction - Behaviour change communication for sanitation uptake and provision of safe water and safe water storage - Relief compensation to affected households	- Hard-to-reach areas were overlooked in water supply and sanitation service delivery - Lack of convergence of activities between disaster-related impacts on WASH and damage compensation - Incongruence between house damage and damaged to latrines or household hand pumps - Minimal coverage in the villages through piped water supply schemes in rural areas

3	Community based organisations	Youth facilitators	Agency –recruited local paid-volunteers	Trained for supporting programme implementation - Relief distribution and Hygiene promotion, - Household surveys and monitoring - Construction and Facilitation skills	- Limited role within programme - Lack of appropriate skills and knowledge of public health promotion or no prior experience of working in disaster affected areas - Active only during the programme duration
		Community-Based Organisations	Disaster preparedness networks	- Training in DRR - Search and rescue, shelter management committees - Village task forces (TFs)	- Limited funding and informal organised efforts in responding to disasters, no clear role in longer-term recovery
		Village Water and Sanitation Committees and Gaon Kalyan Samiti (Village Development committee)	WASH groups either constituted by government or Oxfam and village development	- Committee generally comprises of local government representatives, schoolteacher, kindergarten (Anganwadi) worker, community health worker (Accredited Social Health Activist, ASHA), villager elders, Self-help group members. - Mandated to identify beneficiaries, support latrine construction and responsible for operation and maintenance of latrines and communal handpumps - Attended training organised by Oxfam and received toolkits to repair and maintain handpump	- In villages where government committees were not functional Oxfam facilitated development of new committees called Water and sanitation user groups - Require handholding and training for understanding technical aspects of operation and maintenance of WASH systems - Lack in technical understanding of repairing and maintenance of WASH systems - Potential for motivating and generating demand for latrine use was not exploited
4	Local NGOs	Development and DRR	UNNAYAN, SOLAR and Gopinath Juvak Sangh	- Prior experience of 1999 super cyclone - Humanitarian objectives and relief distribution - Partnerships and networks for response	- Funding for longer-term recovery programmes - Expertise and mandate for WASH and resilience programming

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Rural Development Department (RDD) organised 234 tankers, 345 mobile vans, 29 lakh water pouches and deployed generators to restart piped water supply in 18 affected districts through the Rural Water Supply and Sanitation (RWSS). RDD response included disinfection of 58,100 tubewells and distribution of 1,661 (25-kg) bags of bleaching powder. The financial costs included INR 122.34 lakh for emergency drinking water and additional INR 27.61 crores for repairing 3040 rural piped water systems and 1,62,170 damaged tubewells. Despite above measures, sanitation facilities were lacking in the cyclone shelters, and in the affected villages. There were gaps in outreach measures by the RDD as they had limited capacities in the face of multiple disasters. Self-employed mechanics (SEMs) were deployed for hand pump disinfection, but they could not access the remote, waterlogged and isolated villages. Similarly, mobile water tankers catered to the roadside villages and ignored the farthest hamlets and island villages. During a RDD meeting for INGO coordination in WASH support, it emerged that subsequent rains and floods had stretched the Department's limited resources, and greater flexibility was needed in the humanitarian WASH response for the changing conditions and the local context. RDD officials encouraged NGOs to undertake disinfection of water sources, water treatment, storage and testing, (re)construction of water sources and raised platforms, hygiene promotion among communities and schools, assessments and trainings. 246 Issues pertaining to WASH response raised during the meeting were:

- Disinfection of water sources: It was decided that INGOs should focus on disinfection of private water sources and wells, while RDD disinfected the government-installed tubewells. All sources, including ponds, should be disinfected, but messages should be given to avoid drinking pond water.
- Household versus community-level focus: RDD encouraged NGOs to focus on households while government could focus on the community level for hygiene promotion.
- Sanitation options: The prevalent open defecation practice, near water sources, was recognised as a major health threat; there was a need for stronger evidence for the suitability and appropriateness of trench toilets in the context of Odisha. During the meeting, RDD

encouraged sharing of experiences by agencies on trench toilets and sanitation promotion approaches to continue beyond the emergencies.

- Tankers, pumps and treatment units: RDD welcomed the deployment of tankers, generators/ solar pumps by INGOs to support supply, treatment and distribution of water.

The World Bank funded and supported a $1.45 billion programme in the cyclone-affected districts of Ganjam, Puri and Khorda for building disaster resilient houses, improving slums and city infrastructure, and strengthening disaster risk management capacities. Additionally, $313 million funds were pledged by the World Bank and the Asian Development Bank: $55 million for construction of 162 cyclone shelters, $152 million for reconstruction of damaged households within a 5 km radius of the coastline, and slum redevelopment. These proposals did not factor WaSH interventions into the resettlement plans.

Table 3 summarises following policies and schemes in WASH and recovery for understanding critical gaps in implementation.

- Water supply schemes: National Rural Drinking water programme
- Sanitation schemes: Total Sanitation Campaign
- Disaster Management Policy (2009) and Act (GoI, 2005) and state plans and relief manuals (Revenue Department 1976; Government of Odisha 1996; OSDMA 2013)

The Ministry of Drinking Water and Sanitation, Government of India oversees national programmes such as the Total Sanitation Campaign (which includes Nirmal Gram Puraskar, later renamed as Nirmal Bharat Abhiyan, and addressed as Swachh Bharat Abhiyan since October 2014) and National Rural Drinking Water Programme for ensuring safe drinking water and sanitation. In Odisha, this is under the mandate of Rural Development Department.

4.4 Opportunities for strengthening local action

Having described the roles and activities undertaken by various actors in localised disaster recovery, the following table enlists the gaps and opportunities for improving local action.

369 Table 3: Gap Analysis of WASH and disaster management policies in Odisha and India (Source: Author)

Policy/ Scheme	**Institutional and funding features**	**Challenges**
National Rural Drinking water programme ** National Implementer*: Ministry of Drinking Water and sanitation (MDWS) ** State bodies:* Water supply and support organisation (WSSO) & Department of Rural Development, Odisha.	• Funds are under-utilised and only 52.28 % habitations are fully covered, 47.71% are partially covered and only 2.27% PWSS are reported to be managed by the rural population. • Decentralised and Public-private partnership between Gram Panchayat and PHED; • Shift the focus from handpumps to PWSS, focuses on avoiding reliance on single water sources, which can be contaminated during natural calamities, and promotes integrated use of traditional systems • Convergence with TSC and MGNREGA for ponds construction, drainage, latrines • ASHA Workers shall be paid an incentive of INR 75 per water supply connection.	1. Only 2% for natural calamities with 100% allocations by the central government as per policy, which limits the funds available from the state to address rural drinking water after disasters. 2. Policy emphasises water security but lags in implementation; knowledge generation is top-down. 3. Gender-blind policy approach: Nominal representation of women at village-level committees or those who are trained and employed as mechanics

Swachh Bharat Mission (SBA/SBM) Clean India Mission, 2014 ** National Implementers:* MDWS with two Sub-Missions, the Swachh Bharat Mission (Gramin) and the Swachh Bharat Mission (Urban) ** State bodies:* Department of Rural Development, Odisha	• National flagship programme to provide access to individual household latrines (IHHL) to all rural households, schools, anganwadis and public institutions • Yearly list of beneficiaries is generated, finalised through verification, and approved by Gram Sabha and Panchayat Samiti for eventual approval by Zilla Parishad for IHHLs • For subsequent years it shall be placed to Gram Sabha in usual manner during preparation of labour budget of total MGNREGS works. • Convergence with MGNREGS with INR 4,500/- for labour, INR 4600/- NBA, beneficiary contribution of INR 900/- for SC/ST, small marginal farmers, landless labourers physically handicapped women-headed families	1. Annual beneficiary identification, subsidies provision, convergence with MGNREGA, which has abysmal records of implementation in the state are deterrents in sanitation development. 2. In the context of disaster recovery, the opportunity for advocating changes and generating demand for sanitation is missed. 3. Lack of support for Households/habitations interested in constructing latrines post-disasters and lack of provision of latrines within the disaster shelters for children, elderly and disabled

Disaster Management Act (2005) and Policy (2009) ** National Implementers:* National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NIDM) ** State bodies & policy:* (OSDMA)	• Emphasises provision of drinking water supply, and recovery measures by line departments post-disasters, however completely missed sanitation • Policy refers to reconstruction to build disaster resilient structures and advocates for speedy, owner driven, linking with safe development and livelihood restoration • Odisha Relief Code (1996) • OSDMA is not the implementing authority, their main role is in coordination and overseeing disaster risk reduction and reconstruction programmes	1. Erosion is not acknowledged as a natural disaster, hence affected families do not receive relief or rehabilitation support. 2. Lack of emphasis on restoration of WASH facilities, sanitation is missed in relief manuals 3. No provision for damage compensation for water and sanitation facilities 4. Lack of guidelines for tackling open defecation in a post-disaster context, especially strategies for demand generation and approaches for increasing uptake of sanitation services

370

5. Discussion

The findings indicate that WASH during recovery remains a critical gap in existing policies, schemes and programming strategies, and often ignores post-disaster sanitation and hygiene. Arguably, an opportunity available during recovery, to instil and sustain changes in WASH, is often missed by the agencies.

a) Post disaster WASH is often relief-centric and ignores longer-term recovery: The government officials and line departments focused on short-term, relief-centric water supply, ignoring the longer-term recovery needs of the disaster-affected and displaced populations. The provision of water supply and food provisioning was limited to the relief camps and accessible villages. It was observed that the affected populations living in the relief camps, multi-purpose shelters, and villages had inadequate water sources and sanitation facilities during recovery. The government measures did not reach out to the remote villages, which were worst hit by floods and cyclones, where the most vulnerable groups had limited access to WASH facilities. The PHED restored piped water supply schemes (PWSS) and disinfected spot sources (handpumps and tubewells) along the roads, and townships but the rural areas did not have PWSS, and remained under-served. The hygiene promotion efforts by government were limited in the post-disaster context, they did not concern with uptake of latrine use, health risks associated with unsafe practices in water handling and open defecation. These challenged the effectiveness and impact of hygiene promotion efforts carried out by NGOs, as a result hygiene behavioural changes were difficult to sustain without committed longer-term efforts in addressing the attitudinal changes by the government post-disasters.

b) Existing policies lack focus on WASH during recovery: the Disaster Management Act (2005), and the Amendment Bill (2016) have paid little attention to issues related to WASH during recovery and these issues are not supported through other policies and guidelines. Sanitation provision during response is not mentioned in the outdated Odisha relief code manual, and did not feature in the OSDMA reconstruction programme funded by World Bank. The State relief codes and manuals were found to be inadequate as a guiding document for Government relief: the provisions in the codes lay down the

process to be established before, during and after a disaster, and assign duties but leave it open for the District administration on the specifics of how to perform those duties, to protect the basic rights and entitlements of the affected population. The line departments follow the Odisha Relief Code, 1980 (updated in 1996), which is an out-dated relief manual for post-disaster action, and does not reflect the complexities of recurring, 'localised' and multiple disasters or provide clear, adequate emphasis on recovery of WASH and related systems for longer-term, as reflected in other studies undertaken in Odisha (Ray-Bennett, 2009a). When the line departments initiated immediate water provisioning measures and convened the NGO coordination meetings they chose to not take action on prevalent open defecation practices in the region. Sanitation was not included in preparedness measures, as all the measures constituted by OSDMA and RDD focused on raised handpumps, stockpiling of water purification tablets, and purchase of water treatment units only. The affected households did not receive any financial support as they bore the cost of raising platforms for hand pumps and were not provided with any technical assistance for operation and maintenance of newly installed water facilities.

c) Lack of attention to local actors and women in WASH during recovery: The local actors, service providers, and Panchayati Raj institutions (PRIs) implementing the schemes had limited capacities, resources and power. In order to sustain behavioural changes post-disasters, the involvement of community leaders needs to be systematised in hygiene promotion efforts. The PRIs have limited resources to allocate annual subsidies for post-disaster toilet construction and hand pump installation. There is potential to involve the health and education service providers in hygiene education through outreach programmes. However, their existing responsibilities in sector-specific roles do not encourage them to undertake hygiene education activities during recovery. Furthermore, the existing village water sanitation and hygiene committees can be systematically involved in post-disaster WASH programmes, in decision-making and strengthening linkages between response and recovery actions and development programmes. There is also potential to enhance livelihood opportunities along with sanitation improvement in rural areas, which could be explored during recovery phase. Consequently, this study underscores the importance of training and technical expertise to strengthen the community capacities

through local institutions and institution-building (Manyena, 2009). By this we do not mean conducting training as events, but looking at these as part of a larger process of capacity development, by which people, organisations and societies strengthen and sustain their abilities to take effective decisions and actions to reduce disaster risk' (Scott & Few, 2016). Women faced privacy and security issues due to lack of latrines, difficulties during open defecation and water collection, and problems in attending to menstrual hygiene needs during disasters. The manuals, policies and programmes do not incorporate women's needs and challenges faced during disasters, and are blind to gender sensitivities during relief distribution. There are no separate WaSH facilities for women, or privacy in the relief camps and cyclone shelters. Gender aspects in WASH during recovery were overlooked by the government actions, an aspect noted in other research (Krishnan & Twigg, 2016; Krishnan et al., 2015; O'Reilly, 2010; Sommer, 2012).

d) Policies in WASH and disaster risk reduction fail to consider multi-hazard perspective: The WASH preparedness measures lacked a multi-hazard perspective, as different disasters had different impacts on WASH facilities – cyclones caused structural damages to the water facilities during storm surge while floods caused submergence and inundation resulting in groundwater contamination and erosion caused WASH facilities to be washed away. Although OSDMA was lauded for its coordination efforts with local and international NGOs and multinational organisations during disasters, for implementing disaster preparedness and mitigation measures, recovery and reconstruction from multiple disasters was missing from the recent policy shift from a reactive response to proactive prevention approach in the Disaster Management Act of 2005 and the Policy, 2009. These do not consider erosion as a natural disaster, thereby preventing the government and NGOs from providing relief and rehabilitation support to erosion-affected households in Odisha.

e) Local action and measures for WASH during recovery are fragmented and siloed: Local actors and community-based organisations such as youth networks and women's self-help groups play crucial role in search and rescue, evacuation, community mobilization, early warning dissemination and emergency food and water provisioning during the cyclone. Local actors are themselves affected by cyclone, yet as

seen in Balasore they can champion themselves collectively and organise community kitchens for providing cooked food to flood-affected populations living in camps. Thus, community-based organisations (CBOs) were instrumental in ensuring displaced populations living in relief camps were provided with food packages and water supply. However, these sporadic efforts fall short due to lack of resources for income generation activities to address emerging livelihood needs during recovery. Different line depts - DWSM, RDD, PHED, OSDMA and R&DM are responsible for related aspects in WASH and recovery. This division of disaster management functions in the government, for relief coordination and undertaking recovery, results in a fragmented approach. For instance, OSDMA focused on preparedness and coordination during disasters, while the Revenue and Disaster Management Department focus on recovery and rehabilitation. Although OSDMA coordinated reconstruction planning and implementation it was limited in its focus and mandate for WASH, and acquisition of safer land for reconstruction which was looked after by the R&DM department.

Our study had strengths and limitations. Our empirical research from two districts in Odisha provides indicative guidance on why it is important to focus on WASH during recovery from a multi-hazard perspective. It provides insights from the ground on how local capacities and strengths can be utilized to formulate a cohesive action for WASH post-disasters and what challenges they face. It adds to the growing bodies of literature on disaster recovery, that largely focuses on shelter, and on WASH during recovery. It also provides an understanding of how programmes and policies can be designed and implemented in an inclusive, and participatory manner. There were some limitations in the study as well. In FGDs, group dynamics could have influenced responses as participation was not uniform and some members were more vocal than others. Since it is informed by a case study approach, generalising findings to other settings should be done cautiously. The conclusions drawn from the empirical research, especially regarding role of state disaster management bodies, inclusion of local actors and women in disaster recovery planning is relevant to other states in India, and can be useful to inform further research in low-middle income countries in Global South.

Conclusions

This research argues that provision of WASH facilities during recovery is a critical gap, which requires policy attention. It is argued that there is a potential for strengthening local actors' role in WASH during recovery through devolution of power and authority, and strengthening attention to incorporate women's roles in WASH to reflect the dynamism of women's capacities and needs during recovery. This will allow for WASH systems damaged by multiple disasters to be restored and improved for resilience to future disasters. Based on the findings some of the critical conclusions this paper offers are as follows: a) existing policies should emphasise immediate as well as longer-term WASH needs, and equally invest in learning and innovation in water, sanitation and hygiene behaviour changes. b) a multi-hazard perspective in preparedness, restoration and compensation for damages at the household level through the schemes will ensure households living in extreme poverty are supported in their recovery processes irrespective of the nature of the hazard – cyclone, flood or erosion; c) development WASH schemes, namely the National Rural Drinking Water Programme (NRWDP) and Total Sanitation Campaign, should consider WASH service provision to disaster-affected households by providing additional subsidies for construction of household latrines and water supply systems; d) existing manuals, policies and programmes should incorporate women's needs and challenges faced during disasters, and be sensitive to women's immediate as well as longer-term needs – for instance providing for safe spaces, latrines and bathing cubicles in the cyclone shelters.

Thus, this paper calls for a new research agenda to address post-disaster recovery concerns through the capacities and importance of local actors and how they can bridge the gap between disaster relief and development objectives.

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Declaration of interests

The authors declare no conflict of interest in this research

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