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## The Dual Collective Action Problem Facing a Latrine Program in Nepal

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*Received: 16 September 2013 / Accepted: 06 November 2013 / Published: 06 November 2013*

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**Abstract:** In the last two years, Nepal has enthusiastically embraced the Open Defecation Free approach to dealing with the substantial sanitation problems that trouble many Nepalese villages. This paper analyzes the socio-cultural and collective action dimensions of obstacles facing pit latrine projects in two villages in rural Nepal. The study was conducted in Humla District, Nepal, one of the most remote and impoverished regions of the country. There are no roads in the district, homes have traditionally lacked toileting facilities, and villagers' health suffers from chronic and sometimes severe diarrheal disease, in part as a result from an insufficient or wholly absent sanitation infrastructure. The introduction of pit latrines and education about hand washing and safe drinking water is important to these villagers, as it helps them address some of the major sources of contaminants associated with diarrheal disease. NGOs focused on providing latrines reveal that a latrine design with a toilet pan, pipe to pit, and water bucket to wash away waste was preferable to most villagers interviewed at the start of the latrine-building programs. In the villages under study in this paper, latrines were a novel and recent innovation, and over the past eight years, attempts were made to build one in close proximity to every home. The success of the project hinged upon villager adherence to the agreement to routinely use and maintain the latrines. This introduced a collective action problem at two separate levels – at a population level as well as an intra-household level. This problem and its solutions are the subject of this paper.

**Keywords:** ODF, sanitation, community development, Nepal.

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## 1. Introduction

This paper considers the cooperation and collective action challenges associated with the implementation of a latrine program in Humla District of Northwestern Nepal. With a per capita GDP of US\$72 (KIRDRC 2002), Humla ranks among the poorest regions of the country. Approximately 80% of the Nepalese population lives in rural areas and many of those areas do not have access to the national energy grid. Humla is one such area. The district experiences chronic food shortage and 65% of children under five years of age are malnourished [1]. Infant and maternal mortality are even higher than the alarming national averages [1, 2], and people live in homes without running water, access to latrines, or regular medical care. In many rural villages, villagers households lack running water and plumbing, and in many villages of Humla, toileting facilities of any kind were until recently not available, and rates of diarrheal disease are unsurprisingly high [3-5]. Here, we report the results of seven years of participant observation and focused interviews spanning 2006-13, conducted by the authors in the villages located in Upper Humla.

## 2. Research site and methods

Humla is in the remote northwestern corner of Nepal. Straddling 30°N latitude and lying between 81° and 82° longitude, Humla is one of Nepal's "High Himalayan" districts<sup>1</sup>. It is one of the most isolated regions in Nepal, reachable only by foot or on the small planes that land irregularly in the district capital, Simikot. The district lacks roads altogether and indicators of development are correspondingly low: there are no hospitals (though an under-equipped health post exists in Simikot) and literacy rates are among the lowest in the country: 28% for males and 5% for females [4]. Population density is also very low, with fewer than ten persons per square kilometer [6]. This is due partly to the fact that along with the other northwestern districts of Nepal (Manang, Mustang, Dolpo, and Mugu), Humla has relatively low total fertility rates. The total fertility rate (total births per woman) for the district was estimated at 4.5 in both 1986 and 1991, while the rest of Nepal was 6 in 1985 and 5.6 in 1990 [7]. The relatively low total fertility rates in the northwestern regions may reflect the proportion of their populations that is composed of polyandrous Tibetans. Polyandry is a marriage system practiced by many ethnic Tibetans in this area, and allows a single woman to have multiple husbands simultaneously. The common practice is for a woman to marry a man and all of his brothers, and to have sexual relationships with each of them. Unmarried women do not typically have children in this system and are therefore excluded from the pool of reproductive women. At an aggregate level, this practice depresses the fertility rate [11-13].

The ethnic composition of Humla is complex but not unique, as a similar mix characterizes most of the districts in the High Himalayan zone. The majority of villages are populated by Hindus, mainly

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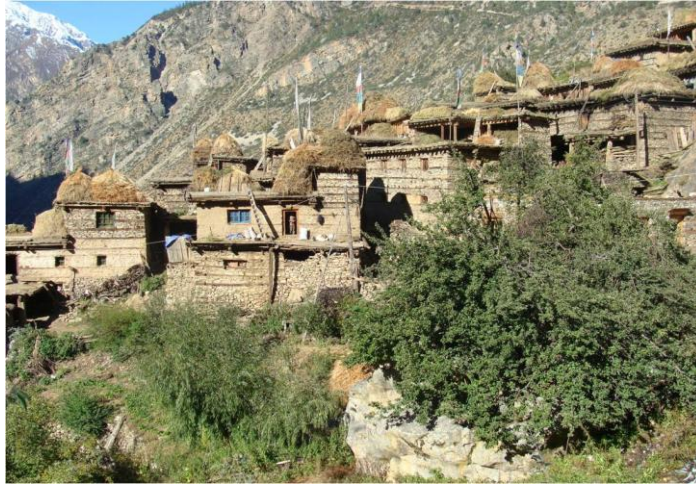
<sup>1</sup> Nepal is divided from north to south into five regions: the High Himalaya, the High Mountain, the Middle Mountain, the Siwalik and in the furthest southern areas, the Tarai [6]. Glaciers cover parts of the High Himalaya.

Chettris, Thakuris and occupational castes, particularly in the southern part of the district. However, like most of the other mountainous districts, part of Humla's population is ethnically Tibetan (roughly 16% according to the 1991 Census of Nepal). This is not because Tibetans moved into the region after their exodus from Tibet in the 1950s, but because the region was part of various Tibetan kingdoms for many centuries. Some of the population of those former kingdoms fell to the south of the northern Nepalese border when it was finally drawn after the 1793 political unification of Nepal.

Over the period 2009-13, the authors conducted focus group discussions and individual interviews with householders in five villages in which the latrine program had been implemented. Interviews were conducted in Nepali and were drawn from a questionnaire that had been approved by the University of Montana's Institutional Review Board for compliance with human subjects protections guidelines. Both men and women were interviewed, and members of all ethnic groups and castes were present at the group discussions.

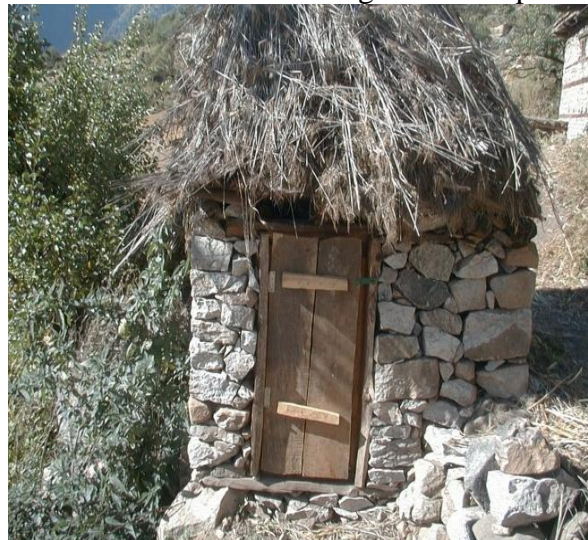
Living conditions in all of the villages in the study are challenging. Houses are small, poorly ventilated, and, until recently, unlit. Most are built in three stories, with domestic stock kept in rooms on the lowest level, the main room (for cooking, sleeping and eating) and storage rooms on the middle level, and storage rooms (for equipment and hay) above. The third level of the house is mostly open—comprised of the roof of the second level, at the back of which (against the hillside) are the storage rooms. When the weather is nice, the rooftops are sunny and pleasant and are the primary site of public meetings, domestic chores such as threshing, children's play, and socializing. The main room may have a wood floor, but is often made of hardened mud (re-plastered regularly with a cow-dung and water mixture), and activities in this room center on the cook fire.

**Figure 1.** Humli village conditions – settlements are densely packed and built into hillsides.



Space, like the community in this caste-bound society, is stratified in a hierarchy that defines its layers terms of purity and pollution. More ritually pure areas are at the top story of the house, which is where you are likely to find valuable items, religious icons, or quarters for distinguished guests. The lowest level of the home, where the animals are stabled, is the more ritually and literally polluted area. This is also the place where women give birth, since childbirth is considered to be a ritually polluting event. In the Hindu villages, women are secluded from men during menstruation and childbirth due to notions of purity and pollution. Similarly, villages and castes groupings themselves are spatially separated, with clear boundaries between castes and behavioral limitations determined by the caste hierarchy. One constant and obvious reminder of this is the reality that lower caste individuals do not draw water from the same tap as the higher castes.

**Figure 2.** A latrine roof is used for storage in a cramped village setting.



Prior to the initiation of programs aimed at improving the hygiene and sanitation situation in the villages, it was common for villagers to defecate on the trails and environs surrounding their communities. This practice is connected in part to notions of purity and pollution. Locally, human waste is considered a polluting substance, as it is believed to be both physically and literally filthy and to ritually pollute individuals who come into contact with it. Thus the disposal of waste is the work of the lowest ('untouchable') castes in these groups. Many villages in the region actually lack any members from such castes though, so the work of removing human waste goes undone. Many spaces within villages are also regarded as unsuitable for the location of an 'impurity' such as a latrine – some villagers cited the presence of a spirit in a particular empty space, or the fact that a space was sometimes used to grow rice, a 'pure' and 'sacred' food, and such a space would obviously be unsuitable as a location for a latrine. Villages are small and densely settled (see Figure 1.) and other empty spaces were at times empty due to inter-family conflict over ownership. So the reasons to reserve spaces that appeared suitable for the location of a household's latrine were many, and often non-intuitive.

Even when space was found for a household's latrine, and the building and education process started, the program encountered problems. These related in large part to the inability of villagers to cooperate effectively, and as such posed a set of challenges that can be best understood from the perspective of the literature on cooperation and the management of first and second order collective action problems, as understood by scholars across the social science disciplines (cf. Bowles 2004 for a discussion of these issues from anthropology) [5]. In its simplest form, a first order collective action problem refers to a situation where people defect from a cooperative strategy that should be shared by cooperators in the protection of a common good. In the case of the latrine program, there was also a second order collective action problem, which related to the inability of cooperators to effectively police or sanction defectors.

### **3. The diffusion of the innovation and the problem of cooperation**

We studied the diffusion of the latrines within the community and found that the pattern followed the predicted S shaped curve noted elsewhere in studies of the diffusion of innovations. In other words, the innovation diffused across segments of society with the innovation being slowly adopted, typically across a multi-year period, earliest by 'innovators' and last by 'laggards' (cf. Rogers 2003 [16]). Some individuals never adopted the practice of using latrines.

Unlike some other shared resources, latrines are 'impure' public goods. Dickinson elegantly captures this feature of latrines in her analysis of decision-making around latrine programs in India

[17]. Latrines have both private and public benefits, so individuals' motivations to adopt them need to be understood in this context. As a private good, latrines benefit the health and cleanliness of an individual. At the same time, latrines use also supports the cleanliness and attractiveness of the entire village environment, which is a public good.

### *3.1 Two Kinds of Cooperation are Required*

Ideally, an entire community will agree to cooperate and members will uniformly adopt latrines along with new behavior patterns associated with regular latrine use. As with other public goods (clean air, clean water), there is an incentive for individuals to 'free-ride' – to defect from the optimal strategy of uniform, community-wide latrine use. Especially with night-time non use of the latrine, it is easy to hide defection. The cost of defection to an individual is minimal, so many people are motivated to defect; the more free-riders behaving in this fashion the faster the cooperative strategy breaks down. It is especially easy for people in this community to rationalize defection, since local people do not always subscribe to a germ theory of disease (attributing ill health to supernatural factors is often just as compelling), because they consider dealing with the clean-up of waste to be beneath them, and because of the fact that there are many vectors for diarrheal disease. Even if their cooperation with the latrine program is perfect, they and their family members may still suffer from gastro-intestinal disease and distress and this can further diminish the motivation to cooperate.

**Figure 3.** The interior of a typical latrine. Note empty flush bucket.



In addition to the need for people to cooperate as a community in a latrine program for benefits to be even distributed among the village, users of each particular latrine installation have to cooperate. Villagers in this region were extensively consulted about latrine design before the project started,

and they and the NGO workers settled upon a latrine design that involved a squat toilet, pipe to pit design. Critical to the proper use of this latrine type is the availability of water to flush waste down the pipe after each use, as pictured in Figure 3.

However, villagers often find it inconvenient to refill the bucket when they are the user who emptied it. This is particularly true when the individual who finished the water in the bucket is a male, since males do not routinely carry water in this setting. Water-carrying is considered to be the work of women, and thus the chore is left to them. But if the empty bucket is not noticed by the woman of the household until after the latrine has been used multiple times, the pipe gets blocked, waste piles up and before long nobody wants to be the person tasked to clean up the resulting mess. This means that even within households, we note a significant cooperation problem. It is compounded by the need for all users, within households, including children, to use the latrine even when very young. This poses a hardship on mothers, who are often very busy with other children, agricultural and herding tasks, and household management.

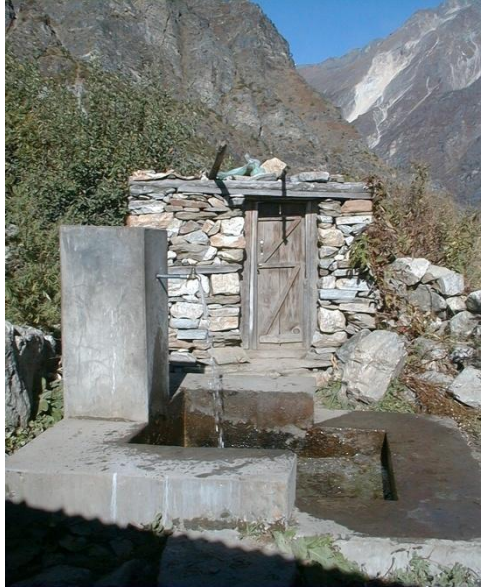
### *3.2 The Second Order Problem*

Enforcing the shared agreement across the community and within the household poses an additional problem. In the literature on the nature of collective action problems in human societies, this is referred to as the ‘second order problem’ [16, 17]. In this society, if defectors from the cooperative strategy are males, individuals of higher caste positions, elder members of the community or otherwise socially ‘superior’ to a person noticing defection, it is usually not culturally appropriate to reprimand. Within households, for instance it is inappropriate for wives to reprimand husbands. As in any cooperation or collective action problem, when defection is detected, and a person enjoins the defector to cooperate, conflict often arises. This is exactly the sort of conflict that many wives would like to avoid with their husbands.

## **4. Recommendations**

There are conventional ‘fixes’ to collective action problems, including privatization, empowerment/distribution of authority among cooperators, development of systems to enhance accountability, and the development of systems of graduated punishment. Given the cultural circumstances surrounding this particular gender, age and caste-observing society, it is unlikely that the development of a system of graduated punishments will ever work. However, our data show that the privatization of latrines, built by users themselves, and shared only within kin or closely related

**Figure 4.** A model latrine placement, where water for flushing waste and handwashing is nearby.



individuals, have the best outcomes with respect to cooperation. We also observe that placement of latrines as close as is feasible to tap stands or other water sources helps with the practical matter of the availability of water in the flush bucket (an ideal placement can be seen in Figure 4.). Other latrine designs should be considered, in which the flush bucket is unnecessary, such as a drop latrine, whenever these are acceptable to users.

Finally, the distribution of authority and empowerment of latrine users via basic science education provided in a school setting, complete with a fully articulated anti-diarrhea program (including education, safe drinking water, functioning latrines, and routine hand washing with soap), is likely to be the best approach to effecting long term change with respect to toileting habits. This approach is also likely to radically transform the frame of mind of future latrine users in this community, and will dramatically enhance individuals' motivation to effectively and universally cooperate in latrine programs.

### **Acknowledgements**

The authors would like to thank The ISIS Foundation for its generous support of this research, in particular Pralhad Dakal, Anjuk Lama, and Wangduk Lama, who discussed the issues herein at length with us. We would also like to thank the many Humli villagers who generously agreed to talk with us about this topic.

### **Conflict of Interest**

The authors declare no conflict of interest.



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