

- With the mission to improve access to safe FSM in rural Cambodia and households' WASH resilience to climate change shocks, iDE explores the link between climate vulnerability, latrine functionality, and FSM intentions and practices.
- This research shows that, with climate change, we can expect to see increased challenges with dysfunctional latrines which will amplify the use of unsafe FSM practices.
- This study proposes a feasible approach for the sector to estimate and target households faced with different thresholds of vulnerability to climate change in order to prioritize and market customized sanitation solutions to those who are most vulnerable.

Need for Project It is estimated that over 25% of Cambodia's population is affected by challenging environments that experience floods, high ground water, and other barriers to effective sanitation and FSM. Rural households living in these environments have limited capacity to resist, cope with and recover from climate hazards.

Methodology In partnership with University of Colorado Boulder, iDE designed a FSM survey to better understand household-level FSM decision-making and practices across five provinces in rural Cambodia. The survey was conducted among 1,472 rural households that owned a pour-flush latrine for more than two years.

FSM Survey data analyzed included frequency of latrine overflow/malfunction during the rainy season, frequency of latrine pits filling up, and unsafe FSM practices such as releasing fecal sludge into the open environment.

Using GIS mapping, FSM Survey data was compared against major and average flood events from 2011 and 2013 respectively, as well as 0.5 km to 1 km buffer regions from observed flood events (Figure 2).

To better understand the isolated effect of being in a flood-prone area, controlling for other confounding factors, a logistic regression model was used to explain latrine functionality as a function of household size, number of pits, depth of pits, poverty status, province and whether or not the household was in a flood-prone area.

Key Findings

- Climate vulnerable households (within the 2011 flood zone) were more likely to have had a non-functional latrine during the rainy season [$r(1,472) = .07$, $p < .01$] and were more likely to have a pit fill up [$r(1,472) = .05$, $p < .05$].
- Living in climate vulnerable flood-prone areas can exacerbate households' unsafe FSM intentions and practices. We found statistically significant differences in unsafe FSM intentions between households living within 1km of the 2011 flood extent and those that do not [$t(1,472) = .03$, $p < .10$]. We also see significantly more households with pierced pits [$t(1,472) = .04$, $p < .05$].
- Of all the factors considered in the logistic regression model to affect pit functionality, household size and living within the 2011 flood prone area were both positive and significant at 1% and 5%, respectively.
- We did not see a greater proportion of IDPoor households in flood-prone areas.

Lessons Learned

- With increased flooding due to climate change, we can expect to see increased challenges with dysfunctional latrines which will amplify the use of unsafe FSM practices.
- Tools to identify less-visible, climate-vulnerable, challenging environments can be costly and difficult (e.g. groundwater mapping, precipitation models, and soil assessments). This study shows that a household level FSM survey tool, in the absence of or in conjunction with a flood incidence map from an existing reputable source, can be used to estimate and target households faced with different thresholds of vulnerability to climate change in order to prioritize and market customized sanitation solutions to those who are most vulnerable.
- As latrine pits fill, the WASH sector must continue to apply evidence to implementation to improve FSM safety and develop sharper strategies to address SDG 6.2. Research into households' decision-making and challenges with rural sanitation systems must also continue to deepen our understanding of behavior, socio-economic vulnerability, and climate change impacts on rural sanitation.



FIGURE 1: LATRINE SHELTER IN KAMPONG THOM PROVINCE WITH VISIBLE FLOOD HIGH WATER MARK ABOUT 1.3 METERS FROM GROUND LEVEL.

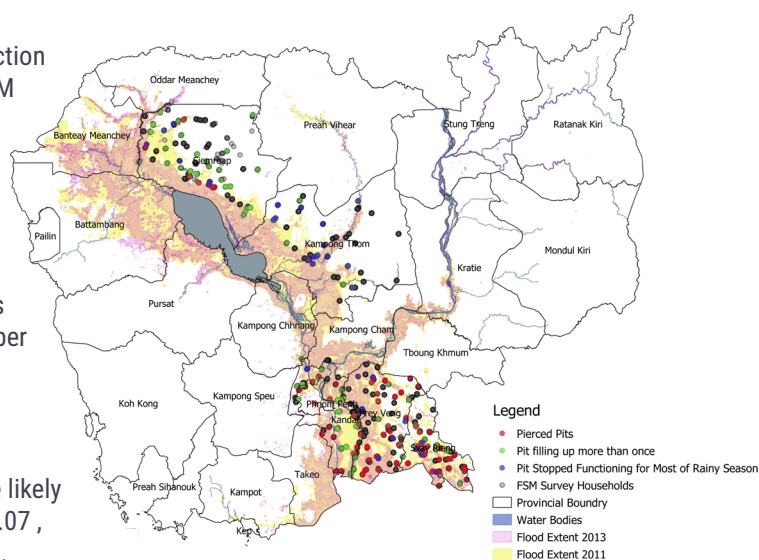


FIGURE 2: RURAL HOUSEHOLDS FACED WITH LATRINE FUNCTIONALITY CHALLENGES AND EXHIBITING UNSAFE FSM BEHAVIORS AGAINST 2011 AND 2013 FLOOD EVENTS IN CAMBODIA



FIGURE 3: PIERCED PIT - RELEASING FECAL SLUDGE INTO OPEN ENVIRONMENT BY PUTTING A HOLE IN PIT WALL

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