

## LANDSLIDE RELATED RAIN GAUGE INSTALLATION IN ROHINGYA REFUGEE CAMP LOCATIONS, COX'S BAZAR<sup>1</sup>, BANGLADESH

### Overview

Chris Piper worked as a Redr Australia deployee with UNDP in Cox's Bazar from April to July 2018, this being in support of the humanitarian program assisting Rohingya refugees there. His official title was 'Early Warning Dissemination and Training Specialist', where his four main areas of responsibility included weather forecasting, preparation and messaging related to cyclones and monsoonal rains; Disaster Risk Management (DRM) training; representing UNDP at various inter-agency meetings; and landslide related initiatives. In addition to this he hosted a number of visitors (both regional UNDP staff and potential donors) around some of the refugee camps.

### Landslide related Initiatives Disaster Risk Management (DRM) Training

As well as observing some landslide training for Rohingya volunteers in the refugee camps facilitated by both UNHCR<sup>2</sup> and the ADPC<sup>3</sup>, one of Chris' main role was to project manage the installation of automated rain gauges in three refugee camp locations.

The monsoon is the main rainy season affecting Cox's Bazar, where on average around 72% of annual rainfall falls between June and September<sup>4</sup>. This risk is then complicated by possible tropical cyclones from April to May, and October to November. The Rohingya settlements consist of relatively flimsy structures, packed closely together, many of these on undulating soft sandstone topography which has largely been stripped of protective vegetation cover. These settlements are therefore highly vulnerable to inclement weather, particularly the heavy rainfall, wind damage, flooding and landslides associated with monsoons and tropical cyclones.

In order to provide some form of early warning about heavy rainfall, together with its effects on potential landslides, UNDP and other agencies have initiated a number of risk reduction initiatives. One of these is the installation of a number of automated rain gauges in key locations throughout the refugee settlements. This initiative, funded by UNHCR and project managed by UNDP,



<sup>1</sup> A link to this landslide-related rain gauge paper can be found at [www.torqaid.com/CXB-rain-gauges](http://www.torqaid.com/CXB-rain-gauges)

<sup>2</sup> United Nations High Commission for Refugees

<sup>3</sup> Asian Disaster Preparedness Centre

<sup>4</sup> ACAPS. (2018). *Rohingya Crisis. Pre-monsoon Review & Review Summary Report*. Retrieved from <https://www.acaps.org/special-report/rohingya-crisis-pre-monsoon-review-summary-report>

was carried out in close cooperation with both the Geological Survey of Bangladesh (GSB) and the Norwegian Geotechnical Institute (NGI). As well as providing an accurate record of rainfall every 15 minutes through the mobile phone network, the gauges also are programmed to give warnings to the key people receiving these calls, alerting them about potential landslides occurring when certain rainfall thresholds are reached<sup>5</sup>. Close cooperation between the GSB and the NGI had, in previous years, resulted in rain gauges being installed in both Cox's Bazar and Teknaf<sup>6</sup>. Separately, a weather station, run by the NGO Samaritans Purse, was also in operation in Camp 12.

Chris was therefore involved in the planning out and installation of three further rain gauges, these being at Kutupalong RC, Camp 16; and at Chakmarkul<sup>7</sup>. Sites were chosen which had reliable access to the mobile phone network, and which were relatively secure. Two Geologists from the GSB first surveyed the ideal sites, with these locations then being approved by the GSB Director General (DG). UNDP then arranged for a local mason to prepare the sites for the equipment, and the actual installation was then carried out by two senior NGI specialists from Norway. The two NGI staff, together with the GSB DG, then visited and upgraded the existing gauges at Cox's Bazar and Teknaf.

The gauges send through automated messages every 15 minutes to 20 selected people, these consisting of a combination of Government and international staff. Automatic



warnings are given if rainfall exceeds the parameters already mentioned. Warnings such as these can alert message recipients, on a 24/7 basis, on potential landslides in the refugee locations at risk. The gauges themselves are therefore a useful contribution to a 'toolbox' of initiatives, designed to reduce risk, and increase safety, in these vulnerable locations.

Chris Piper, Torquay, Australia, Tel: + 61 412 497 317 and [pipercm@iprimus.com.au](mailto:pipercm@iprimus.com.au)  
August 2018

---

<sup>5</sup> These currently being set at 75 mms of rain over three hours; 200 mms of rain over 24 hours; or 350 mms of rain over a three day period

<sup>6</sup> See map at the end of this article

<sup>7</sup> See map at the end of this article

# APPENDIX A: LOCATION OF RAIN GAUGES AT COX'S BAZAR & TEKNAF (OLD), KUTUPALONG RC, CAMP 16, CHAKMARKUL (NEW) & CAMP 12 (SP)

