



# INTRODUCTION

## The journey so far ...

Jo da Silva, Director, International Development  
Arup

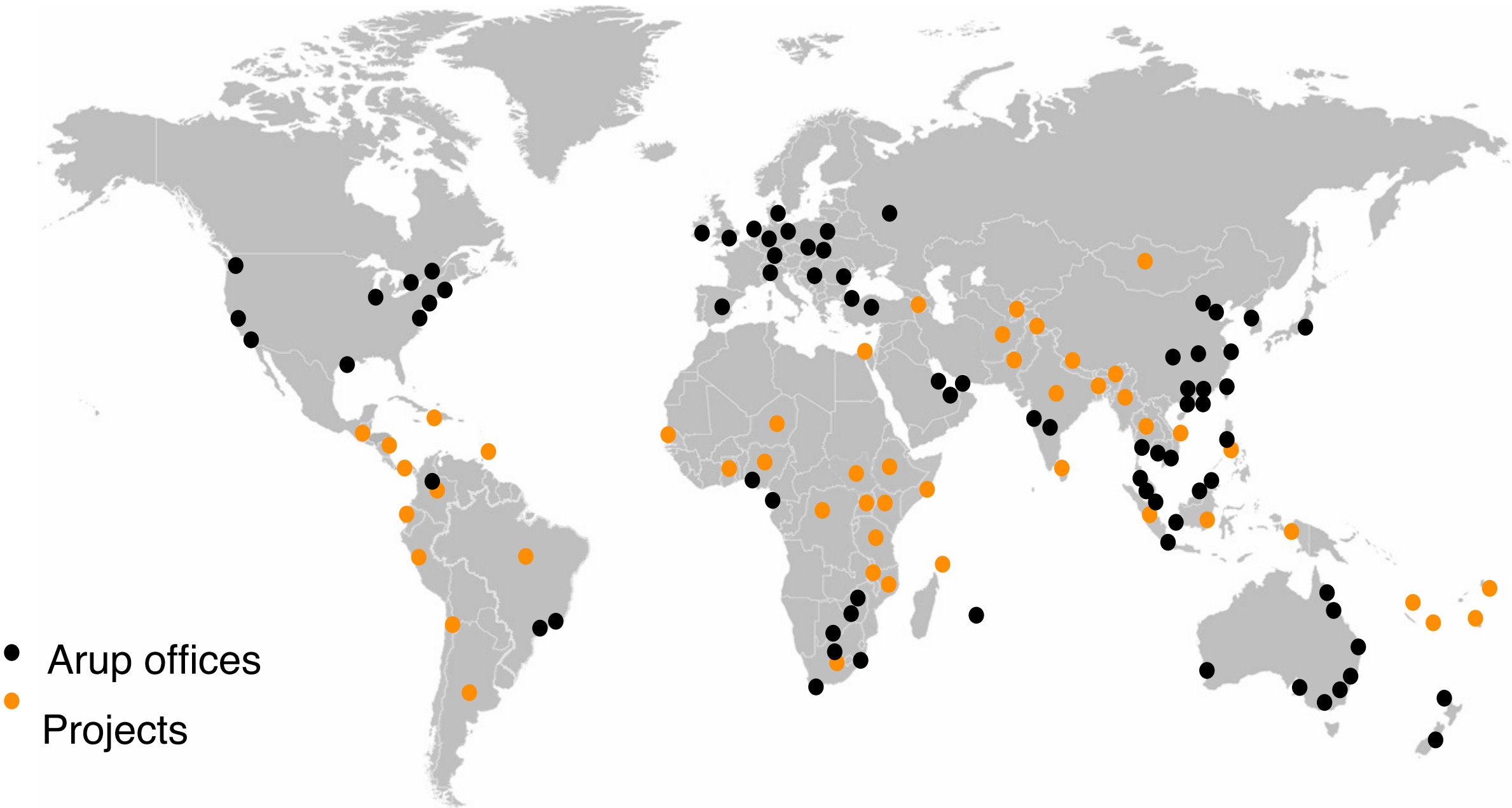
A Roadmap for Safer Schools  
January 30-31, 2017



**GFDRR**  
Global Facility for Disaster Reduction and Recovery

**ARUP**

# Arup



● Arup offices  
● Projects

Malawi School Prototype  
Clinton Hunter Development Foundation



Druk White Lotus School, India  
Drukpa Kargyud Trust



Primary School, Uganda  
Building Tomorrow



Shalom International School, Uganda  
Teso Educational Support Scheme



Model Kindergarten , Ghana  
Sabre Trust



# Sustainable Development Goals

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## 4 QUALITY EDUCATION



Ensure inclusive  
and quality  
education for all  
and promote  
lifelong learning

Build and upgrade  
education facilities  
that are child,  
disability and gender  
sensitive and provide  
**safe**, nonviolent,  
inclusive and effective  
learning environments  
for all



# Impact of Natural Disasters



Hayley Gryc, Arup



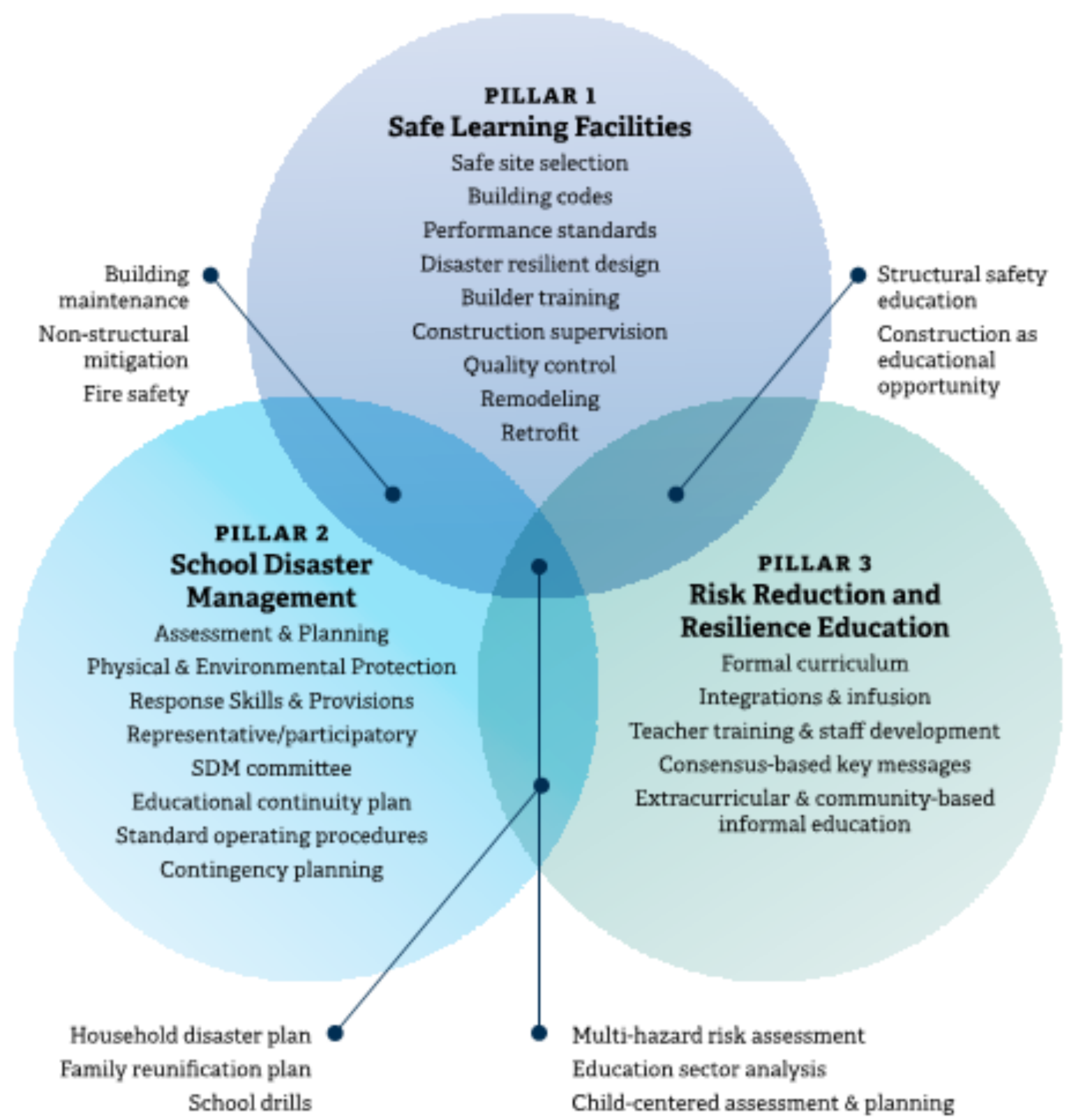
Express Photo: Tashi Tobgyal

April 2015 7.8 magnitude earthquake

- 8,800 killed
- 20,000 classrooms destroyed
- 12,000 classrooms damaged
- 870,000 affected



# What do we mean by Safer Schools?



Ref. Comprehensive School Safety (March 2013)

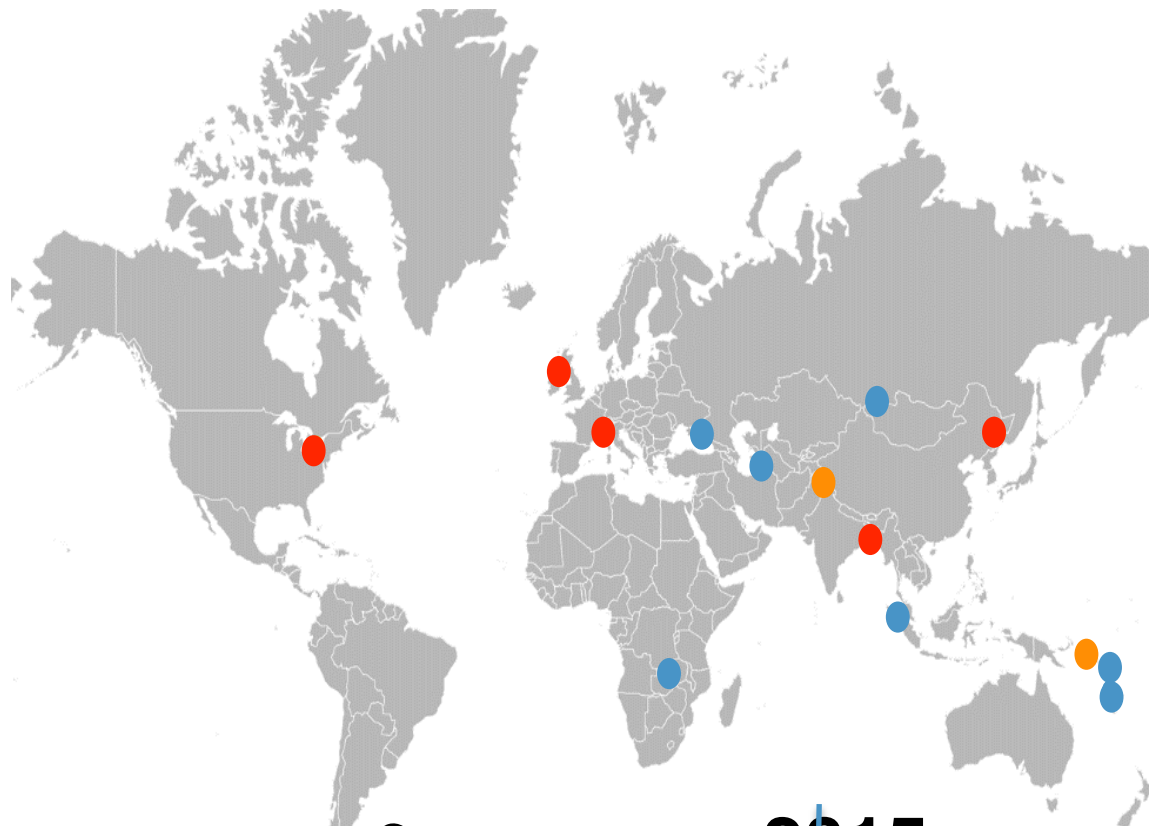
CHARACTERISTICS OF SAFER SCHOOLS	
 HAZARD	 <b>1 Hazard Assessment</b> A hazard assessment has been undertaken to identify the types of hazard that the school may experience (e.g. tsunamis, volcanoes and earthquakes).
 EXPOSURE	 <b>2 Site Location</b> A site assessment has been undertaken to identify key features that may impact exposure to specific hazards including topography, soil conditions, proximity to water bodies/fault lines, vegetation.
	 <b>3 Physical Planning</b> Appropriate mitigation measures have been taken in the physical planning of the site to adequately mitigate against the risks identified as a result of the hazard and site assessments.
 VULNERABILITY	 <b>4 Structural Typology</b> An appropriate structural typology has been used for the buildings which takes account of the most prevalent hazards.
	 <b>5 Building Configuration</b> The building configuration is reasonably symmetric, allows safe egress, avoids irregular features.
	 <b>6 Building Modifications</b> Significant building modifications (e.g. openings, canopies, additional storeys) have not been constructed unless allowed for specifically in the building design.
	 <b>7 Structural Capacity</b> The structural capacity of key elements of the building (e.g. foundations, beams, columns, walls, roof, connections) have been assessed for their ability to transfer vertical and lateral loads.
	 <b>8 Non-Structural Capacity</b> The selection of non-structural elements of buildings (e.g. facades, internal walls, storage of hazardous materials, equipment, and signage) has taken account of the prevalent hazards and are adequately fixed to the main structure.
	 <b>9 Materials And Workmanship</b> There are systems in place to assure the quality of materials and workmanship during construction and / or there are no signs of structural deterioration (e.g. settlement, cracking, corrosion) in key elements of the building (e.g. foundations, beams, columns, walls, roof, connections) that might impair the structural performance.
	 <b>10 Maintenance / Repairs</b> There is adequate funding and local skills available to carry out regular

Ref. Characteristics of Safer Schools ( January 2017)

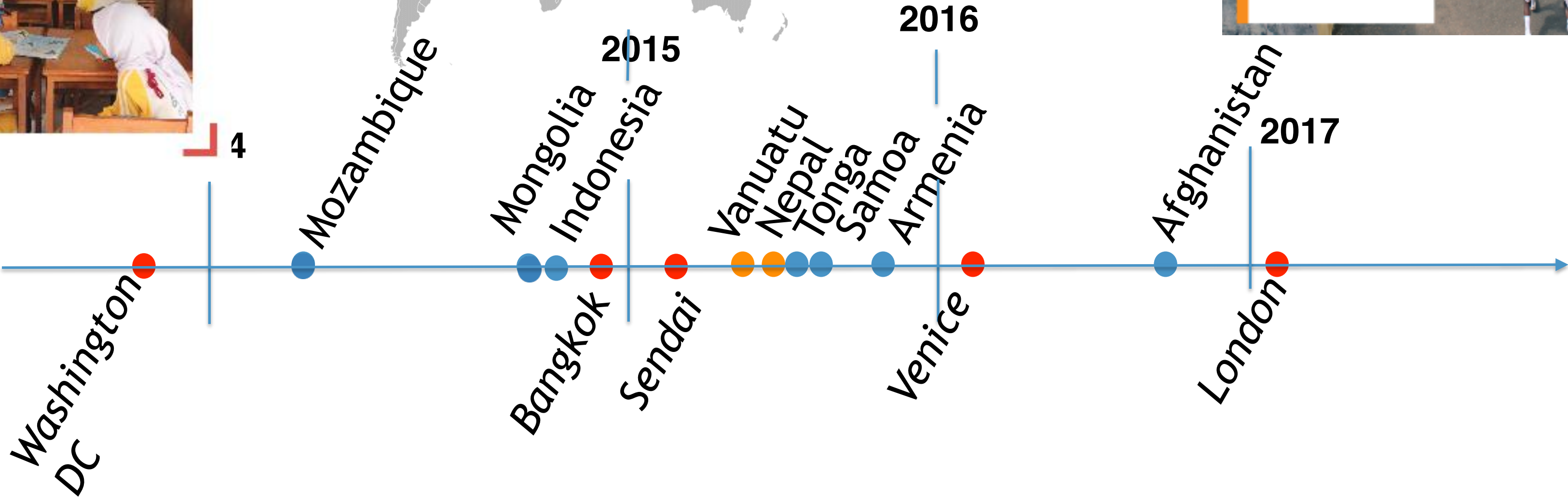
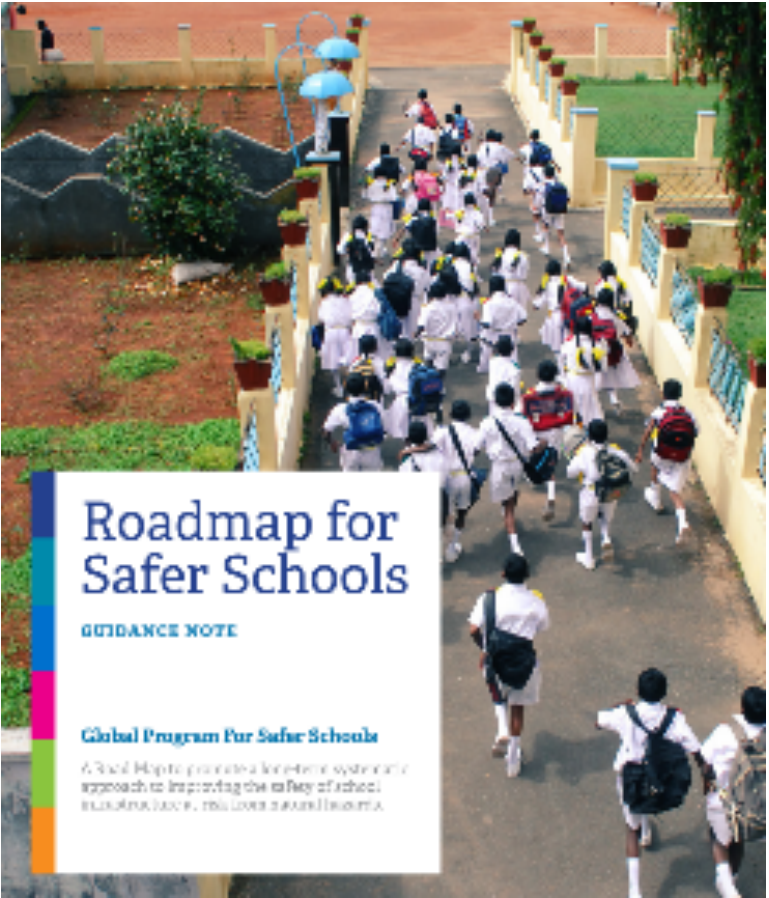


# Global Program for Safer Schools

CHARACTERISTICS  
OF SAFER  
SCHOOLS



**Towards Safer School Construction**  
A community-based approach





# Arup Team

Core +  
Fieldwork  
Team



Case Study  
Team

Specialists



Seismic - Geo    Landslide    Flood    Masonry    Timber



Seismic - Structure    Risk    GIS



# Why are we here?

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**Thank You**