

16th – 17th September 2017

From local building practices to vulnerability reduction: building resilience through existing resources, knowledge and know-how

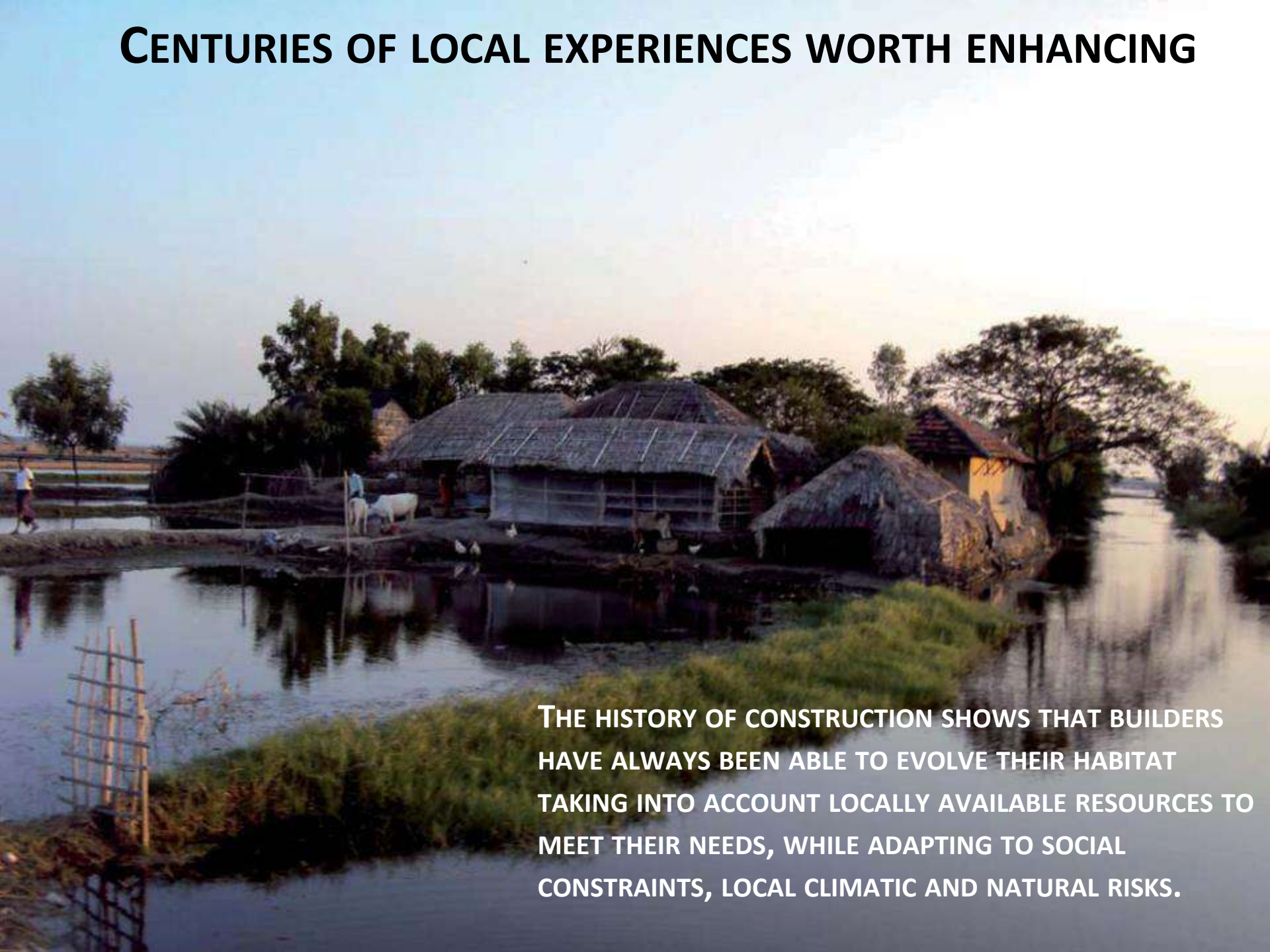
Eng. Olivier Moles¹, Dr. Annalisa Caimi¹, Prof. Mohammad Shariful Islam², Prof. Tahsin Reza Hossain² and Eng. Ratan Kumar Podder³,

¹*CRAterre-ENSAG, International Centre for Earth Construction / National Superior School of Architecture of Grenoble: oriamole@club-internet.fr; annalisa.caimi@gmail.com*

²*Department of Civil Engineering, Bangladesh University of Engineering and Technology (BUET) Dhaka-1000, Bangladesh : msharifislam@ce.buet.ac.bd, mshariful@yahoo.com*

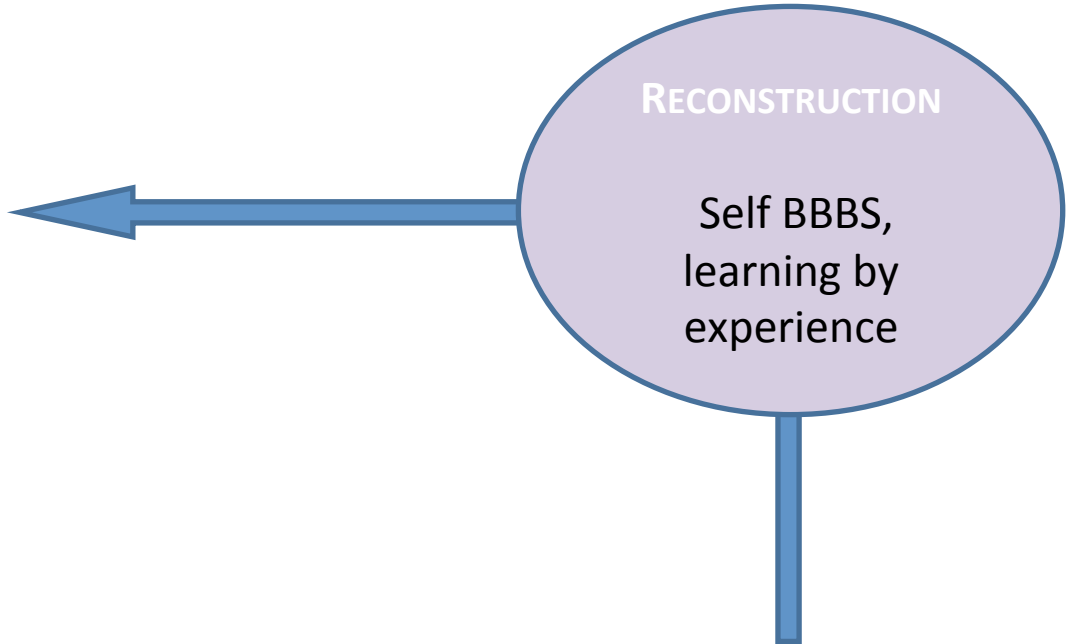
³*Caritas Bangladesh, Dhaka, Bangladesh : ratan@caritasbd.org*

CENTURIES OF LOCAL EXPERIENCES WORTH ENHANCING



THE HISTORY OF CONSTRUCTION SHOWS THAT BUILDERS HAVE ALWAYS BEEN ABLE TO EVOLVE THEIR HABITAT TAKING INTO ACCOUNT LOCALLY AVAILABLE RESOURCES TO MEET THEIR NEEDS, WHILE ADAPTING TO SOCIAL CONSTRAINTS, LOCAL CLIMATIC AND NATURAL RISKS.

LOCAL SOLUTIONS AND STRATEGIES



HOW DOES EXTERNAL SUPPORT HELPS ON IMPROVING LOCAL RESILIENCE?



TENTS



SHELTER KIT

TEMPORARY
SHELTER



LOCAL BUILDING CULTURE

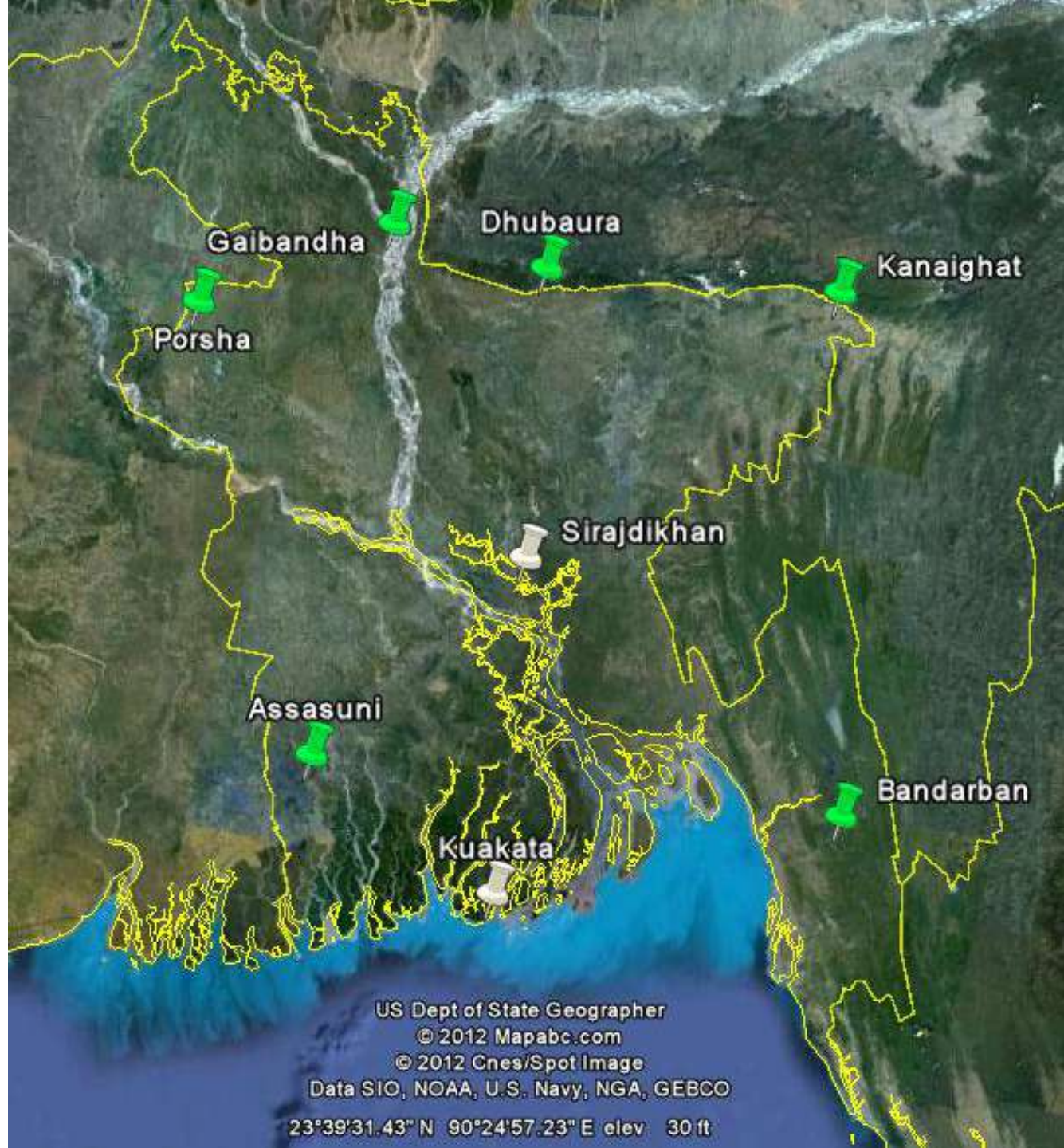
PERMANENT
HOUSES



HOW TO IMPROVE ON THE EXISTING?



From 1970 to 2007



US Dept of State Geographer

© 2012 Mapabc.com

© 2012 Cnes/Spot Image

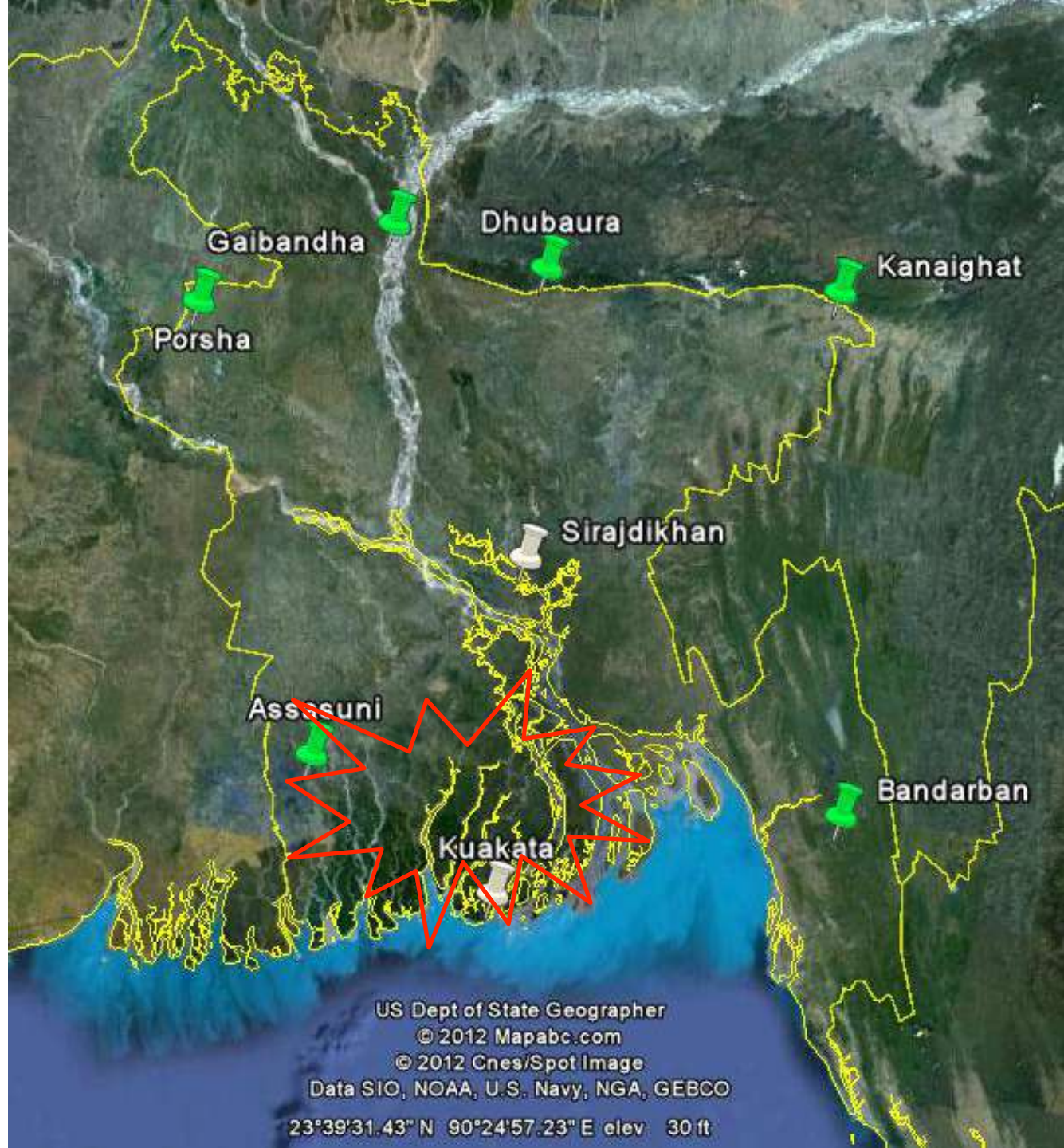
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

23°39'31.43" N 90°24'57.23" E elev 30 ft

From 1970 to 2007



2007, SIDR, improvement



US Dept of State Geographer

© 2012 Mapabc.com

© 2012 Cnes/Spot Image

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

23°39'31.43" N 90°24'57.23" E elev 30 ft

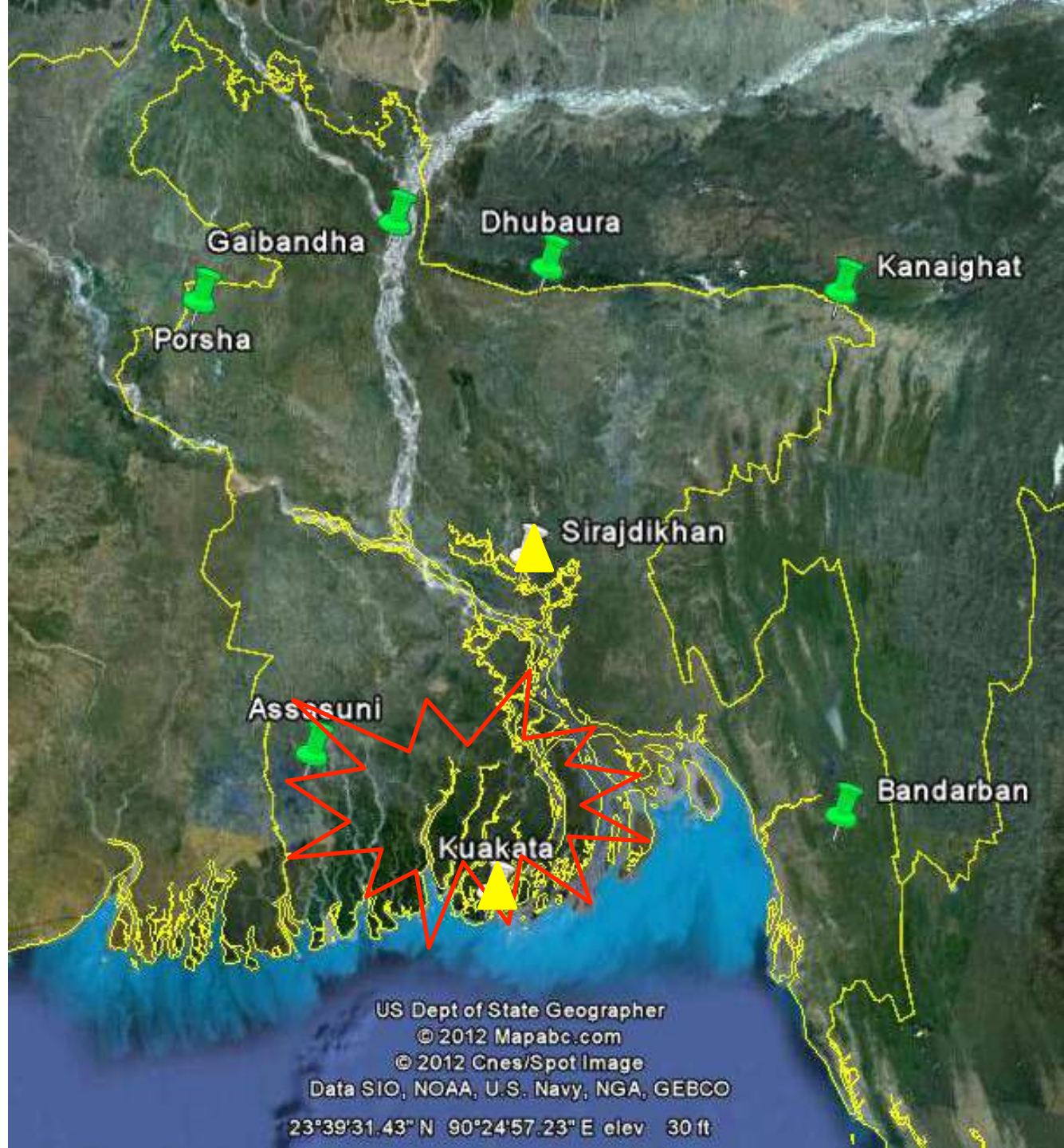
From 1970 to 2007

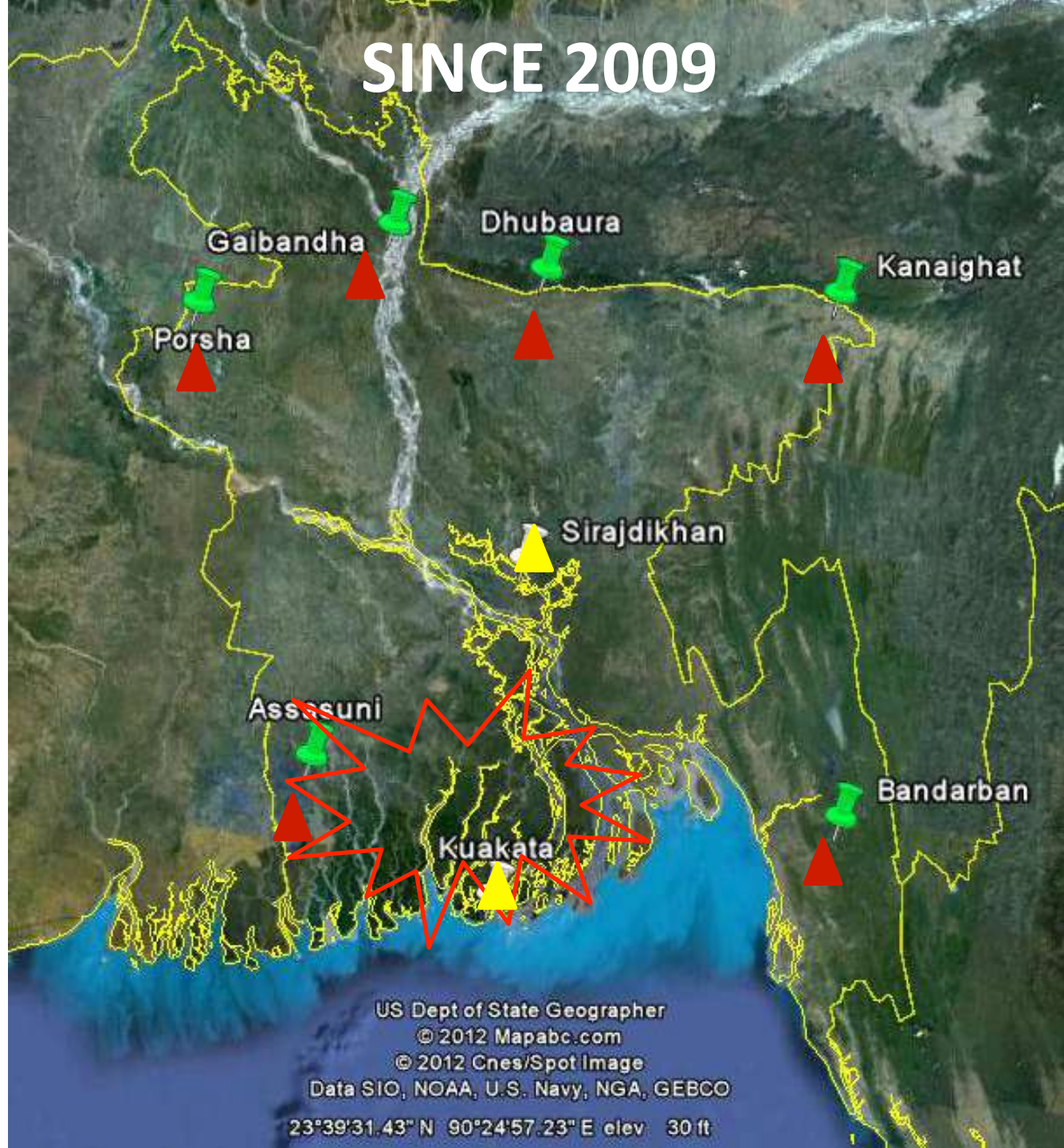
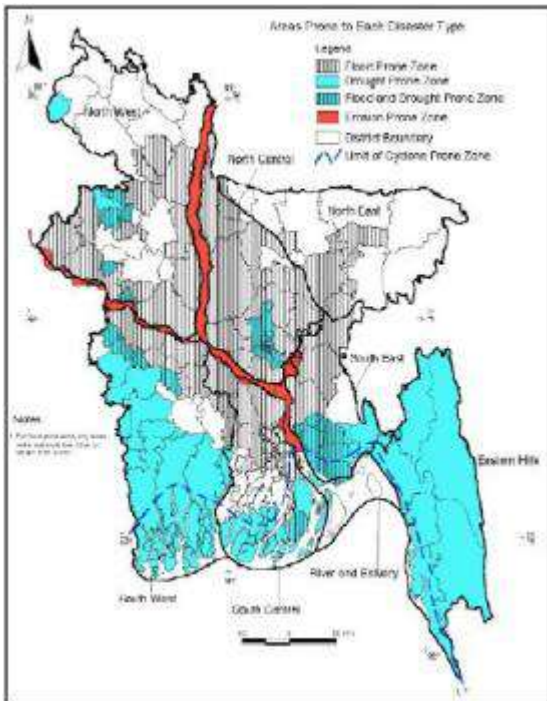


2007, SIDR, improvement



2008 - 2009, Pilot project





US Dept of State Geographer

© 2012 Mapabc.com

© 2012 Cnes/Spot Image

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

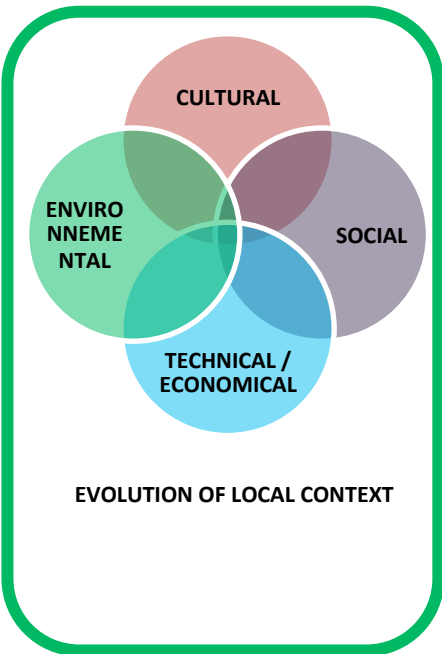
23°39'31.43" N 90°24'57.23" E elev 30 ft

PROJECT APPROACH

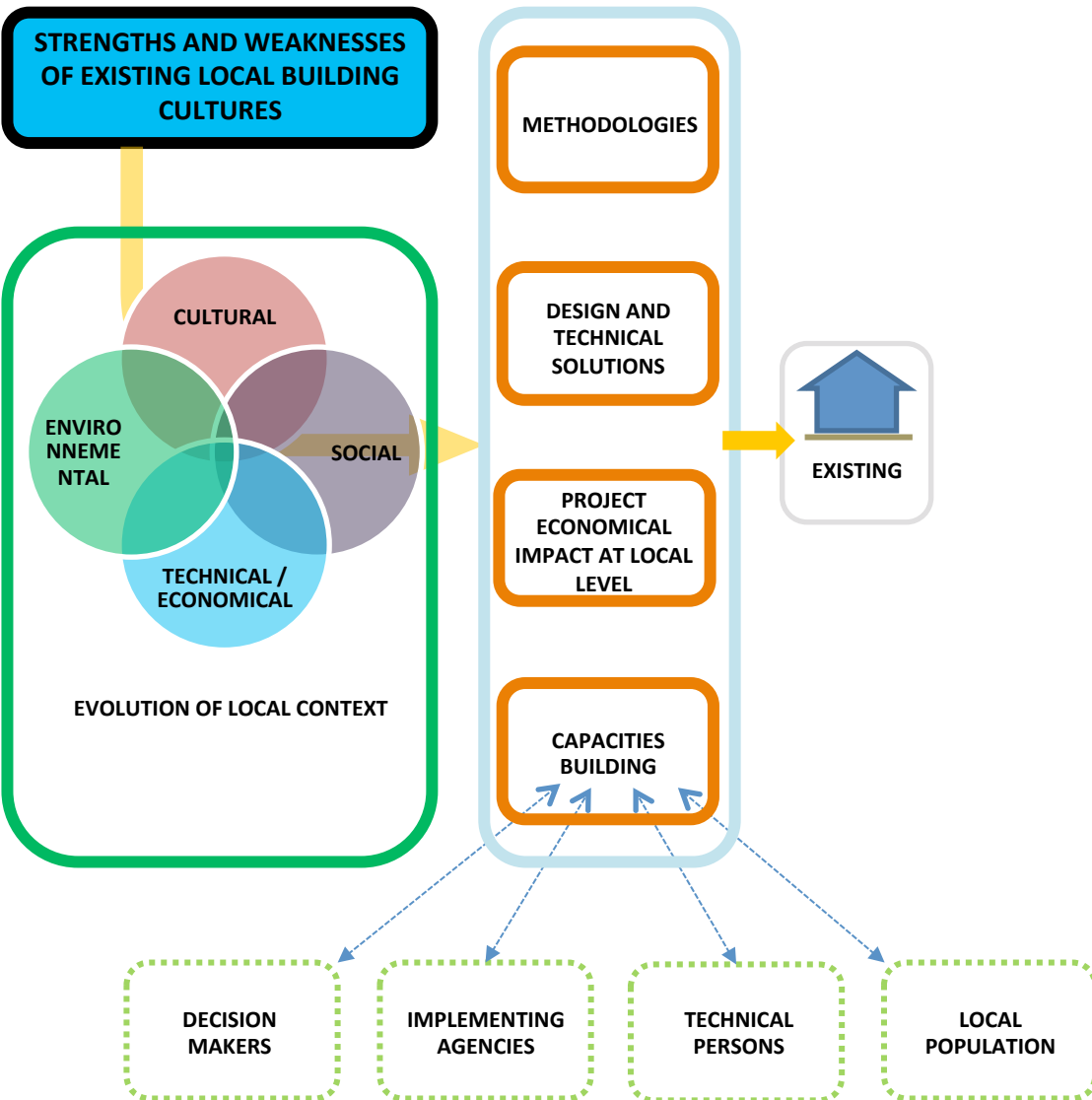
**STRENGTHS AND WEAKNESSES
OF EXISTING LOCAL BUILDING
CULTURES**

PROJECT APPROACH

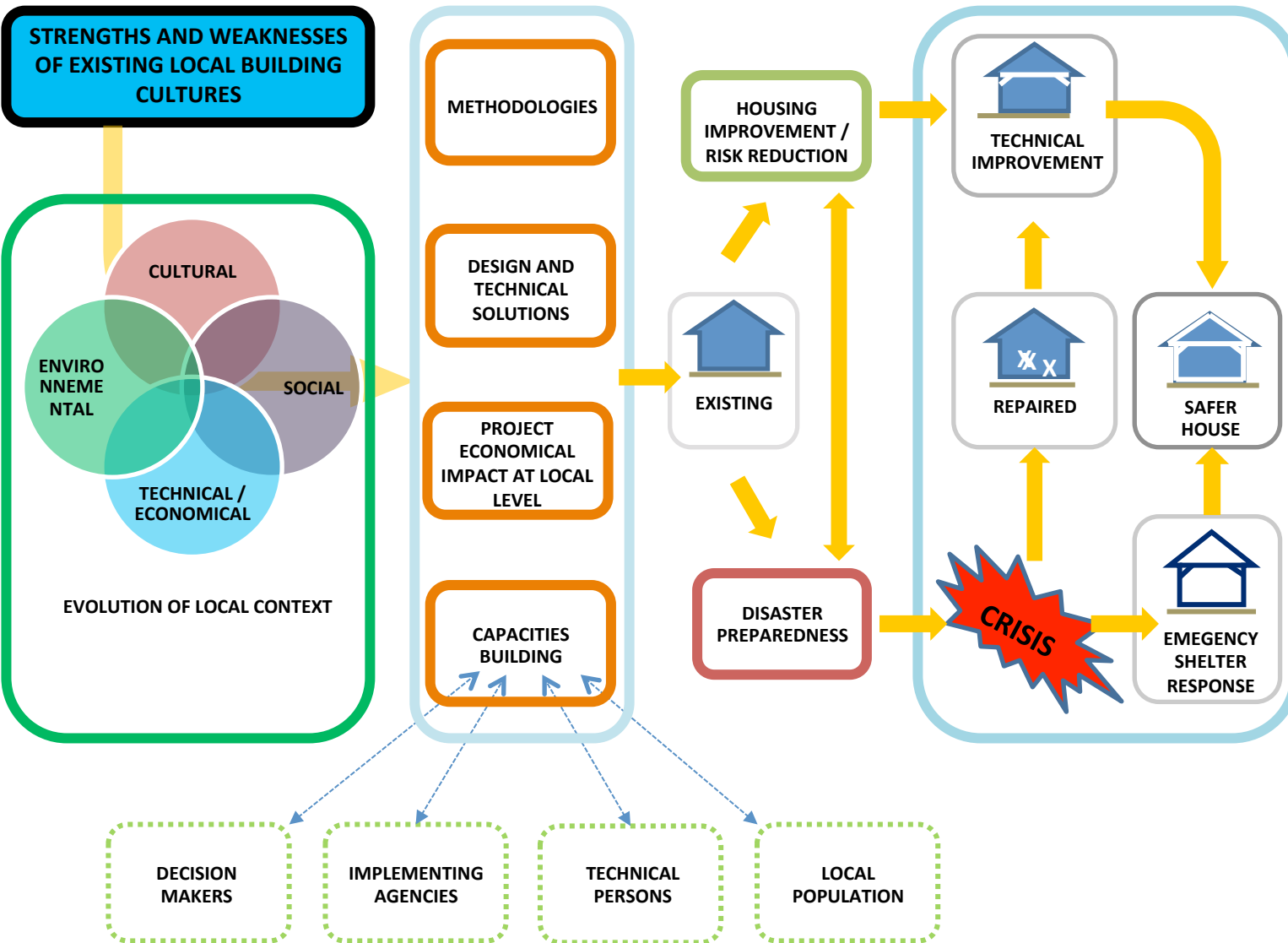
**STRENGTHS AND WEAKNESSES
OF EXISTING LOCAL BUILDING
CULTURES**



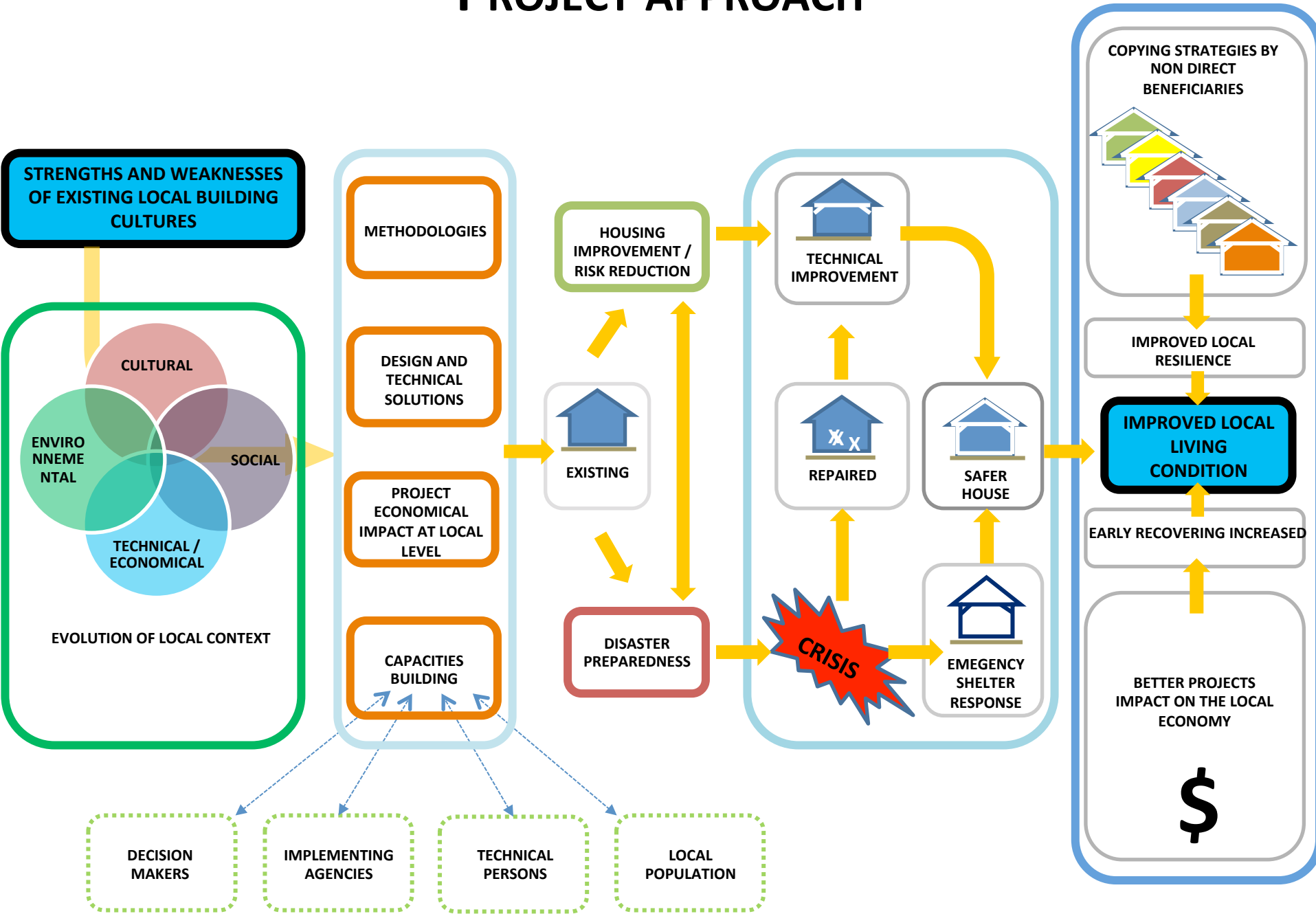
PROJECT APPROACH



PROJECT APPROACH



PROJECT APPROACH



PROJECT SEQUENCE IN EACH CONTEXTS

Information collection
from site

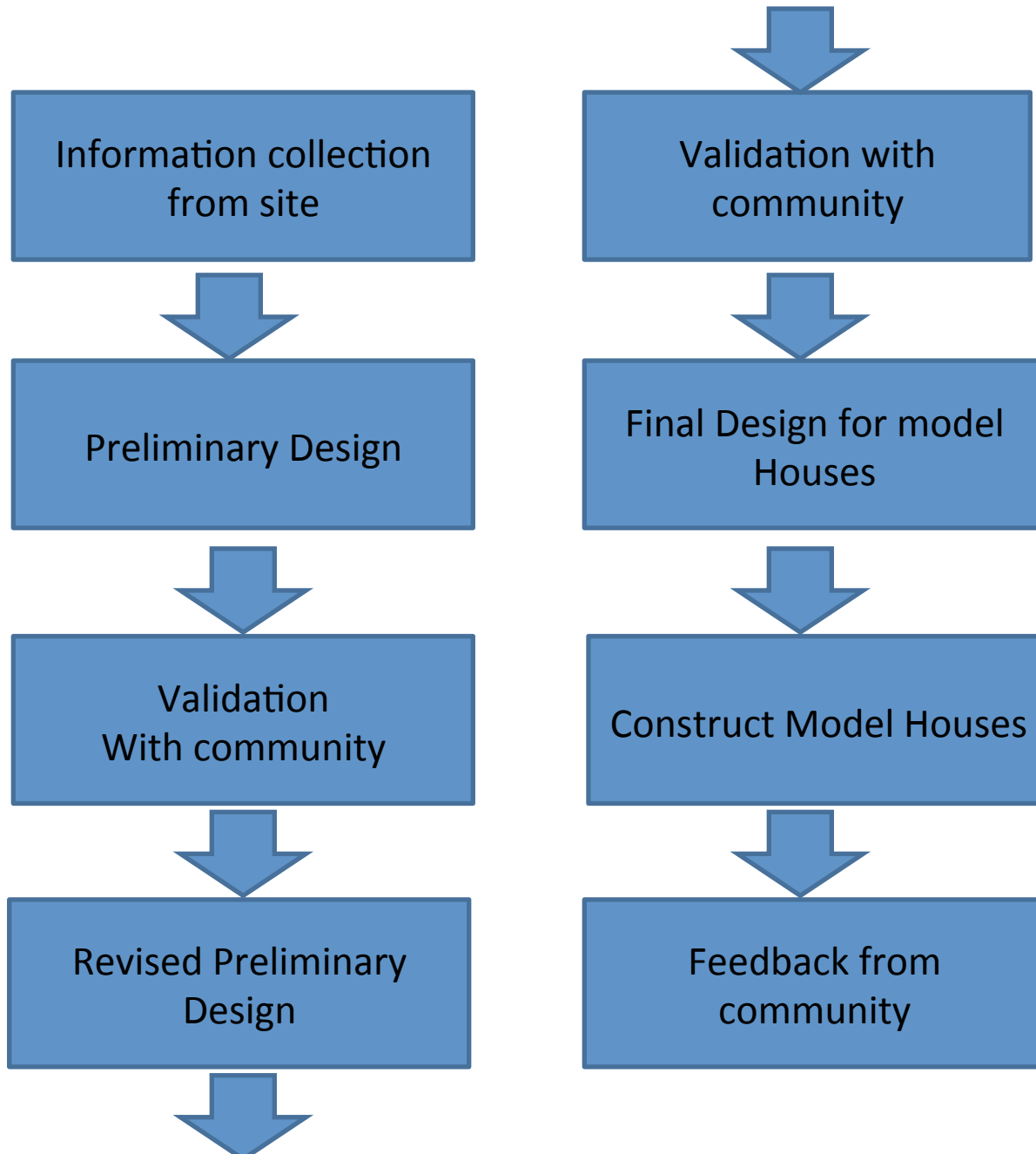


Preliminary Design

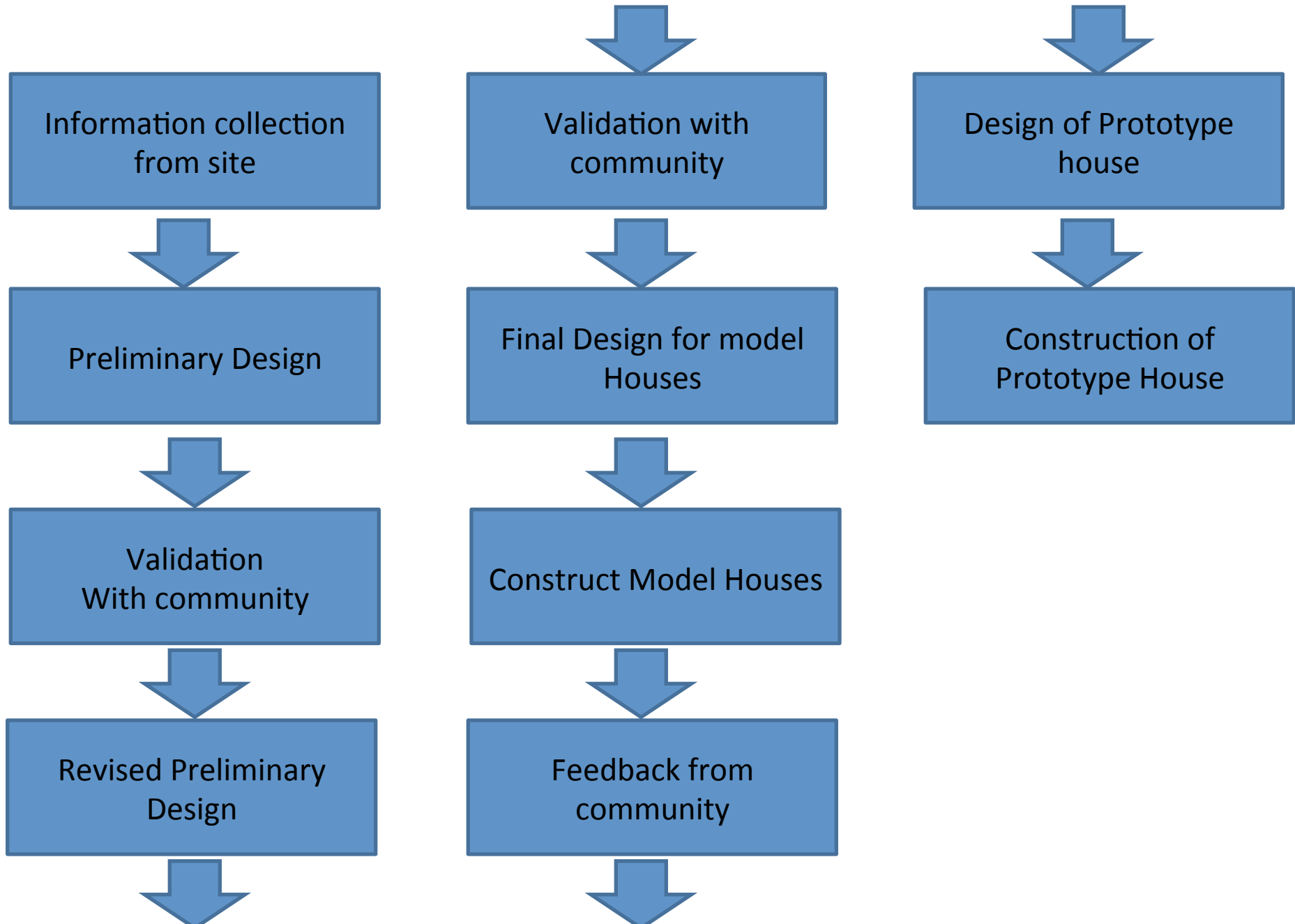


Validation
With community

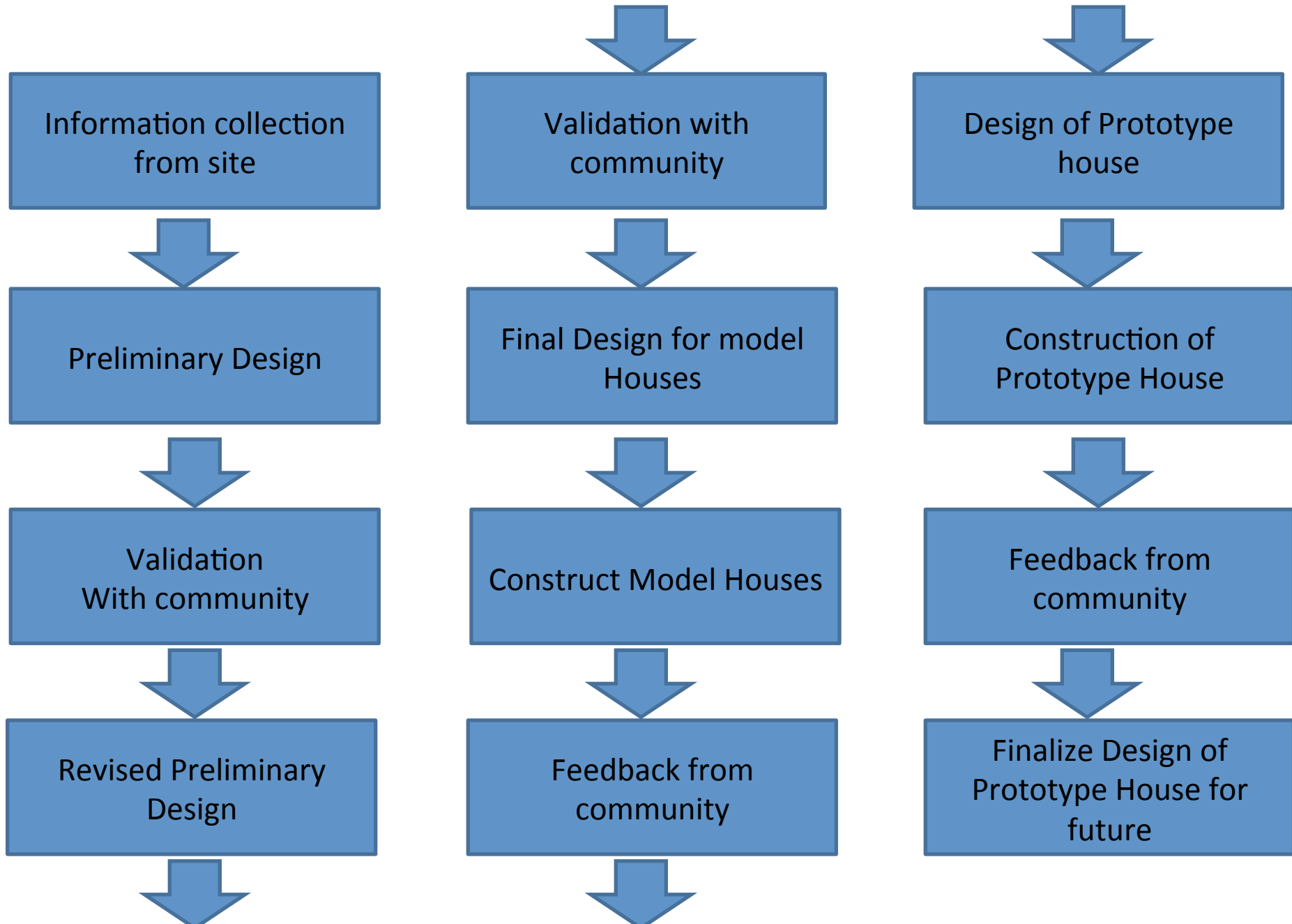
PROJECT SEQUENCE IN EACH CONTEXTS



PROJECT SEQUENCE IN EACH CONTEXTS

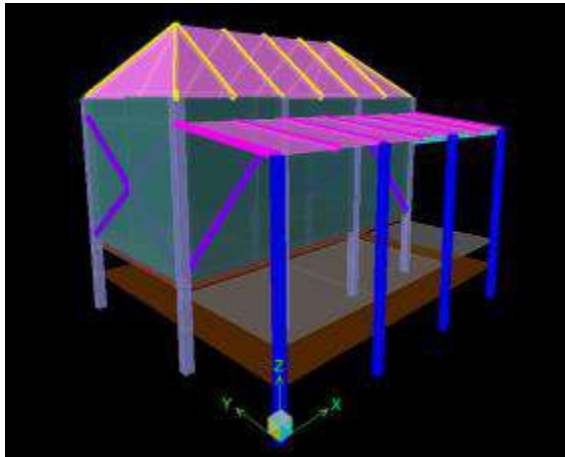


PROJECT SEQUENCE IN EACH CONTEXTS



THE NEED FOR SCIENTIFIC RECOGNITION AND VALIDATION

FINITE ELEMENT MODELLING



FIELD TEST



- A 3D Finite Element model has been developed using ETABS
- All loads are applied
- Sections selected using the stress results and allowable strength values obtained from test results

- **Seismic test (Haïti)**

Dr Vieux Champagne. F 2013:

Analyse de la vulnérabilité sismique des structures à ossature en bois avec remplissage.

par Florent Vieux-champagne

Université Joseph Fourier; Laboratoire 3S-R

RESULTS AT LOCAL LEVEL



**In the same village, two
communities, two ways
of life...
Two shelters approaches**



RESULTS AT NATIONAL LEVEL



- Same supports; different results according to the context
- Discussion at the Shelter Cluster Level
- BUET is teaching the topic

KEY INNOVATIVE ASPECTS OF THE PROJECT AND RECOMMENDATIONS

- **Learning from the existing local building culture and valuing existing communities' best practices**
- **To link tradition and modernity:**
- **To design post disaster project as a support for poverty alleviation**
- **To link action, research and education.**
- **To link emergency, rehabilitation, development, risk reduction and disaster preparedness**



<http://craterre.org>

Thanks for listening

