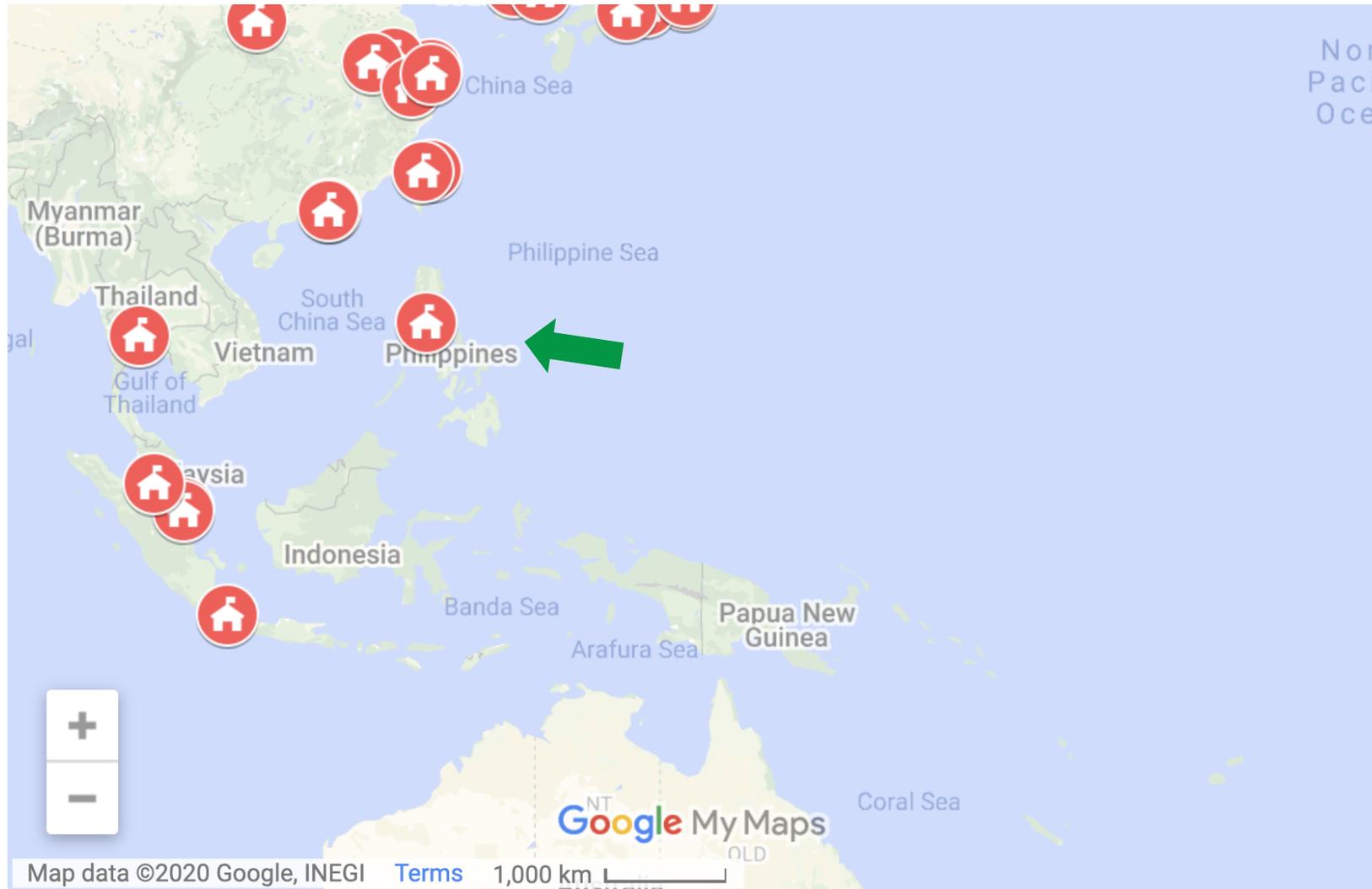


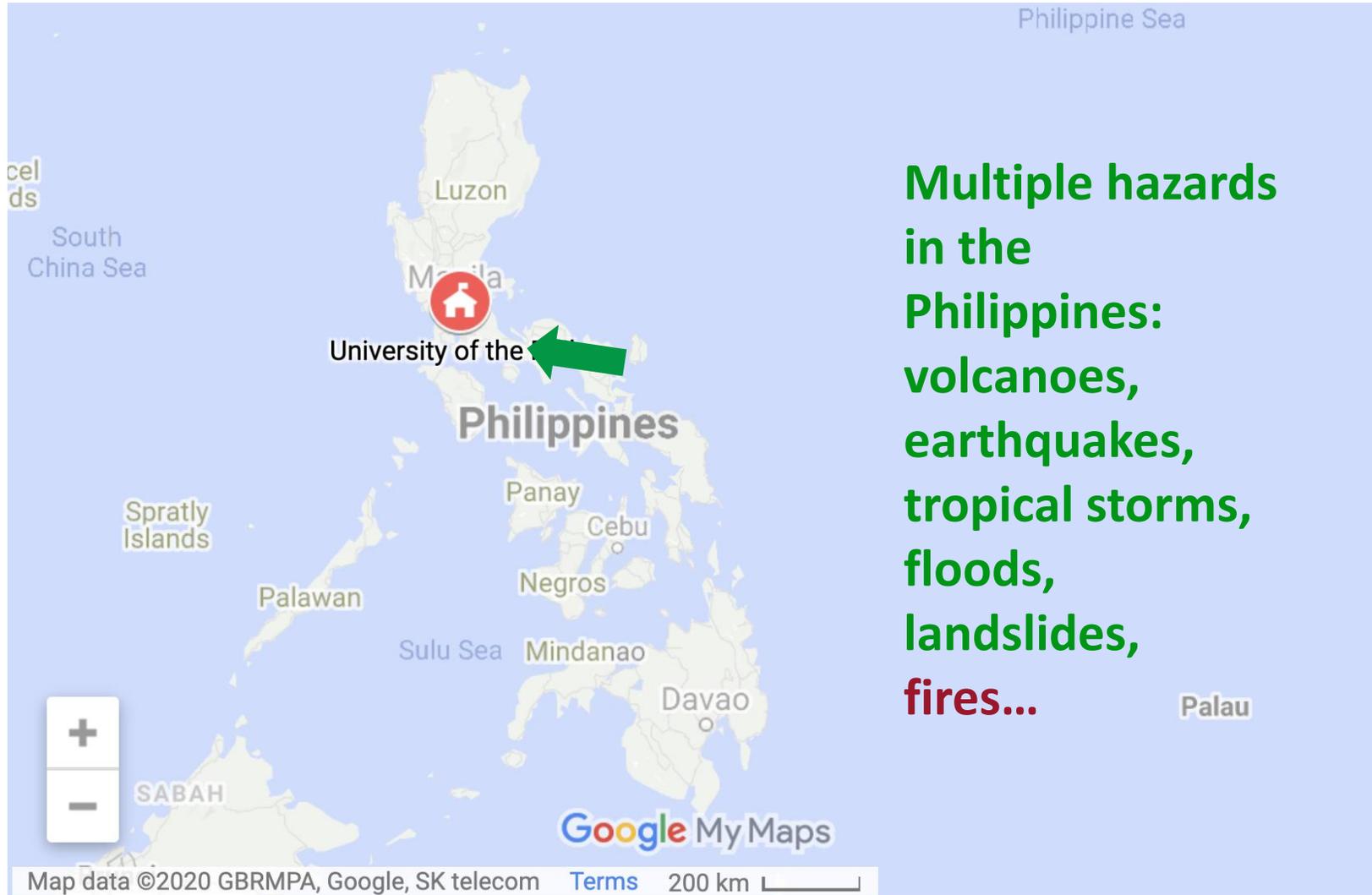
APRU Membership is comprised of leading universities from 18 economies of the Pacific Rim known worldwide for their academic and research excellence.





The Pacific Rim is known for volcanoes, earthquakes, tropical storms, floods, landslides...





**Multiple hazards
in the
Philippines:
volcanoes,
earthquakes,
tropical storms,
floods,
landslides,
fires...**





The 8th APRU-IRIDeS Multi-Hazards Virtual Summer School 2020

3 days webinar



Day 3



Riyanti Djalante

Academic Programme Officer
at United Nations University -
Institute for the Advanced
Study for Sustainability
(UNU-IAS)

Science and Policy



Benito M. Pacheco

Professor at the Institute of
Civil Engineering,
University of the Philippines
Diliman

Regulating Buildings



John Rundle

Distinguished Professor,
Physics and Earth & Planetary Science,
University of California, Davis

Forecasting and Nowcasting

BENITO M. PACHECO

29 JULY 2020



Reenacting a National Legislation* for Buildings: Another Look at Multi-Hazards Resilience in A New Normal

***AN ACT REGULATING THE PLANNING, DESIGN,
CONSTRUCTION, OCCUPANCY, AND
MAINTENANCE OF BUILDINGS**



TODAY'S OBJECTIVES

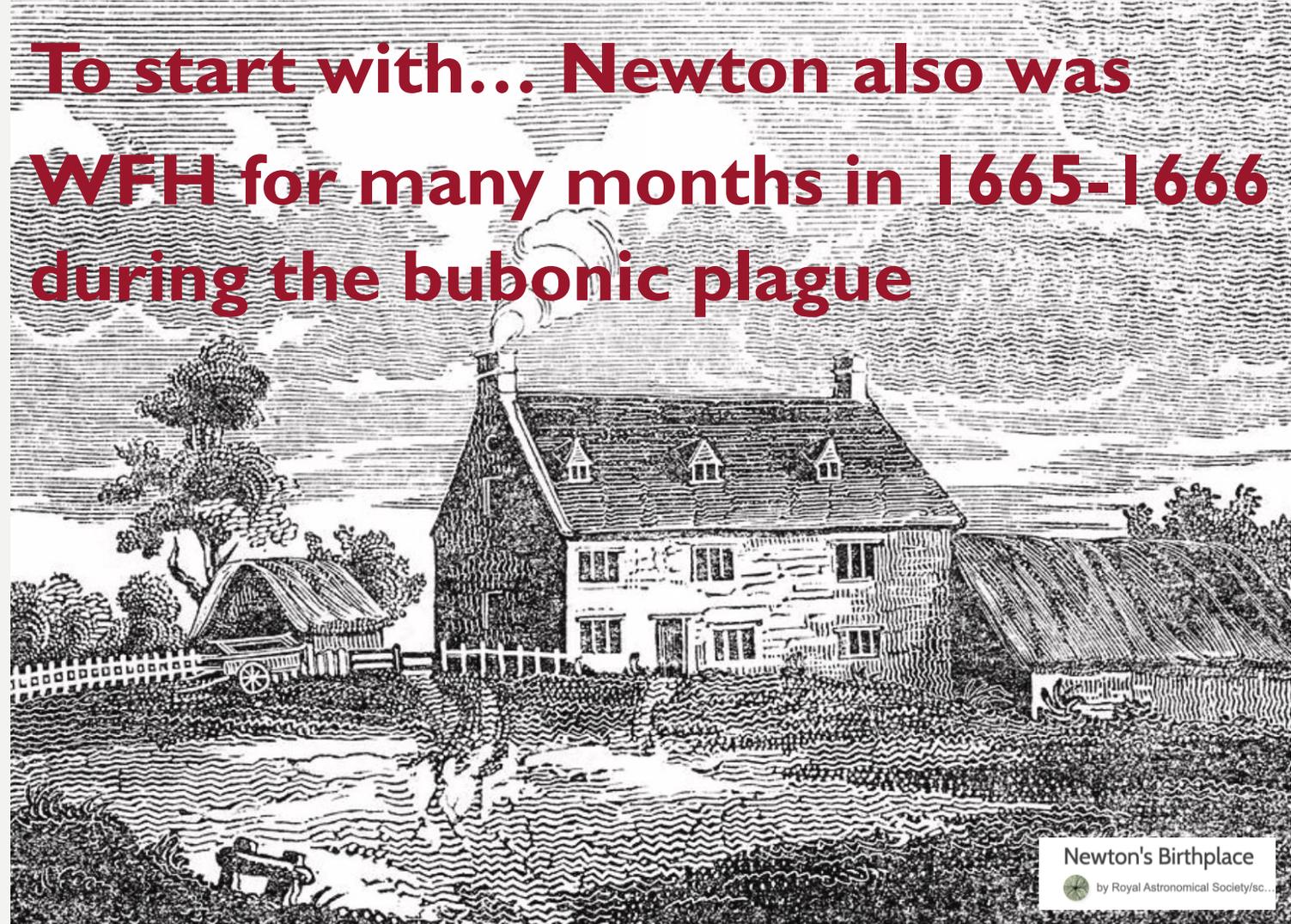
- Review the **history** of national building regulation
- Explain new **features** of Philippine Building Act of 2020 and how to promote S&T innovations in subsidiary Regulations and Standards



ISAAC NEWTON'S RESIDENTIAL BLDG.



To start with... Newton also was **WFH** for many months in 1665-1666 during the bubonic plague



ISAAC NEWTON'S PHYSICS



Never at rest, before and
after the plague:
colors of light;
acceleration of mass



Act according to laws of physical sciences and all our buildings will be resilient, right?

$$\mathbf{F} = \mathbf{M} * \mathbf{A}$$

FORCE = MASS * ACCELERATION

Actually there is much more that is needed from the social sciences!





Actually there is much more that is needed from the social sciences!

$$F = M * A$$

FORCE = MASS * ACCELERATION

Act according to laws of physical sciences and all our buildings will be resilient, right?

SHELTER

BENITO M. PACHECO

29 JULY 2020







SHELTER IS INFRASTRUCTURE

- Shelter is something that covers or affords protection.
- To shelter means to protect people, property, activity,...
- Infrastructure is the resources required for an activity.
- Private + Public = Infra
- House, School, Hospital, Waste Facility, ... = Social Infra
- **Yes, shelter is the most basic infrastructure.**





Yes, shelter is the most basic infrastructure.



EVERY BUILDING IS A SHELTER

What will the Philippine **Building Act** of 2020 say?

“**Building** is any temporary or permanent structure, anchored to the ground, for the **shelter**, enclosure, or support of persons, animals, [plants, produce, products,] machinery, or chattels.”

Yes, every building is a shelter and more.



EVERY BUILDING IS A SHELTER & MORE

Occupancies of the following types are included:

- A, assembly
- B, business
- D, disaster response
- E, educational
- F, factory and industrial
- G, agri and biological
- I, institutional
- M, mercantile
- R, residential
- S, storage
- U, utilities
- Z, high-hazard materials



SHELTERS ARE VULNERABLE

ca. 2003

Approximate location of West Valley Fault

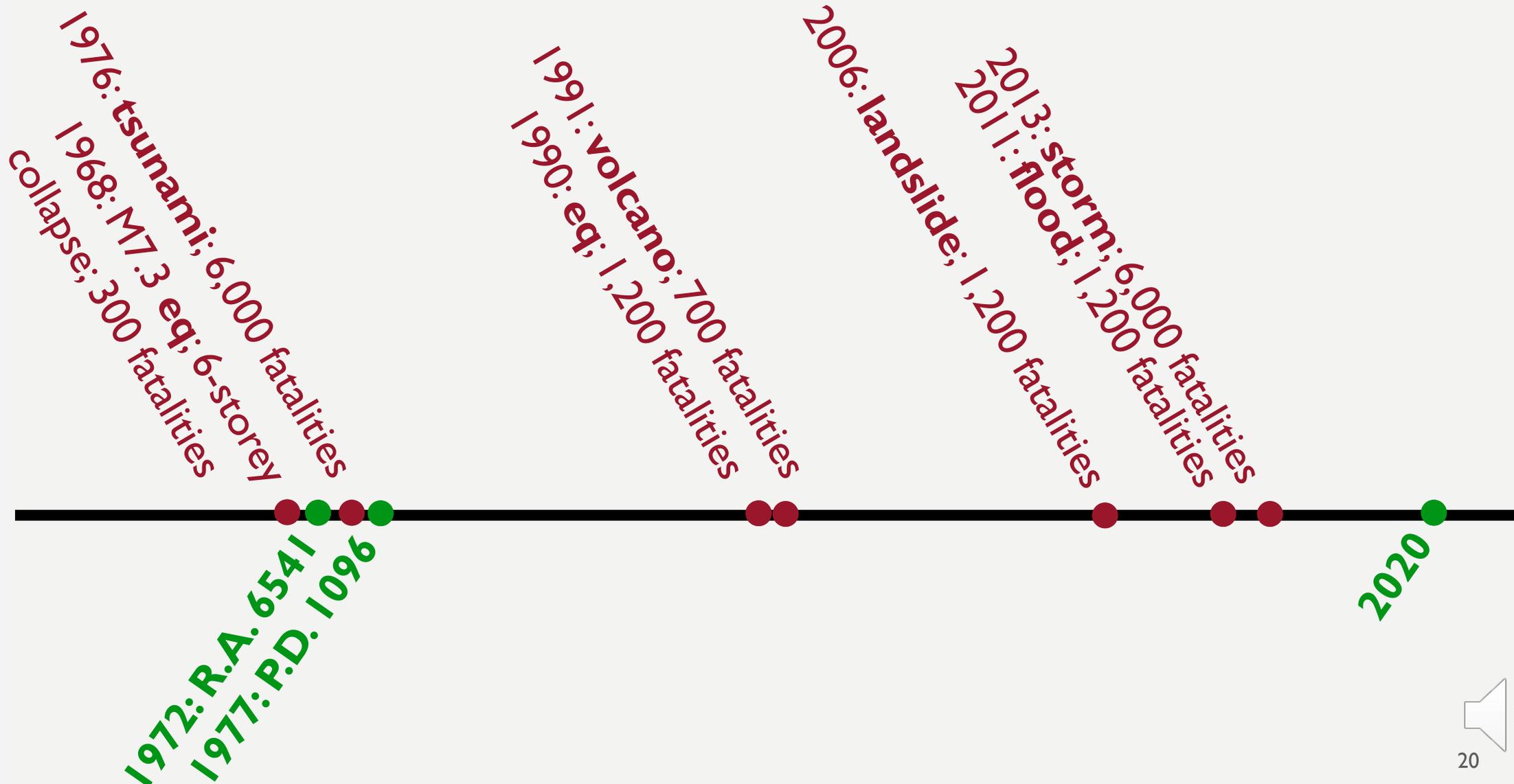
An aerial photograph of the Greater Metro Manila Area in the Philippines. A dashed yellow line runs horizontally across the middle of the image, representing the approximate location of the West Valley Fault. The city is densely packed with buildings of various heights, including several prominent skyscrapers. The sky is clear and blue.

GMMA RAP Study (2014) scenario of M7.2 earthquake: collapsed or completely damaged buildings would cause 37,000 fatalities in Greater Metro Manila Area

Shelters are exposed and vulnerable to multiple hazards. And so are we, the occupants.



SINCE 1968: SELECTED MILESTONES



BUILDING REGULATION FOR RESILIENCE

World Bank global report in 2015:

Developed [economies] have significantly reduced mortality risks from natural hazards through incremental improvement of their regulations for building and land use. While experiencing 47% of disaster events globally in recent decades, they accounted for only 7% of disaster-related fatalities.



SCOPE OF REVIEW AND STUDY

Unfair legal arrangements.

Outdated
technological
arrangements



Ineffective
administrative
arrangements

*Multi-sector, multi-agency, multi-region consultations (2016-2018)
(U.P. National Engineering Center i.c.w. U.P. Law Center)*



SCOPE OF REVIEW AND STUDY

including conflicts among other laws like the Fire Code or the Local Government Code

including hazards that are scientifically less understood and materials or methods that are technologically less familiar



including contradictions among government offices

More than 40 specialists and staff studied (2016-2018) (U.P. National Engineering Center i.c.w. U.P. Law Center)

SCOPE OF REVIEW AND STUDY

By owners, developers, architects, engineers, lawyers, contractors, officials, civil society organizers



*More than 400 stakeholders contributed (2016-2018)
(U.P. National Engineering Center i.c.w. U.P. Law Center)*



SCOPE OF REVIEW AND STUDY

- Formulation of issue papers based on records of previous complaints, grievances, and suggestions, under five (5) broad themes, for stakeholder feedback
- Consultations with various stakeholders: four (4) regional or sub-national and one (1) national
- Focus-group discussions
- Public colloquium
- Study of international practices



SCOPE OF REVIEW AND STUDY

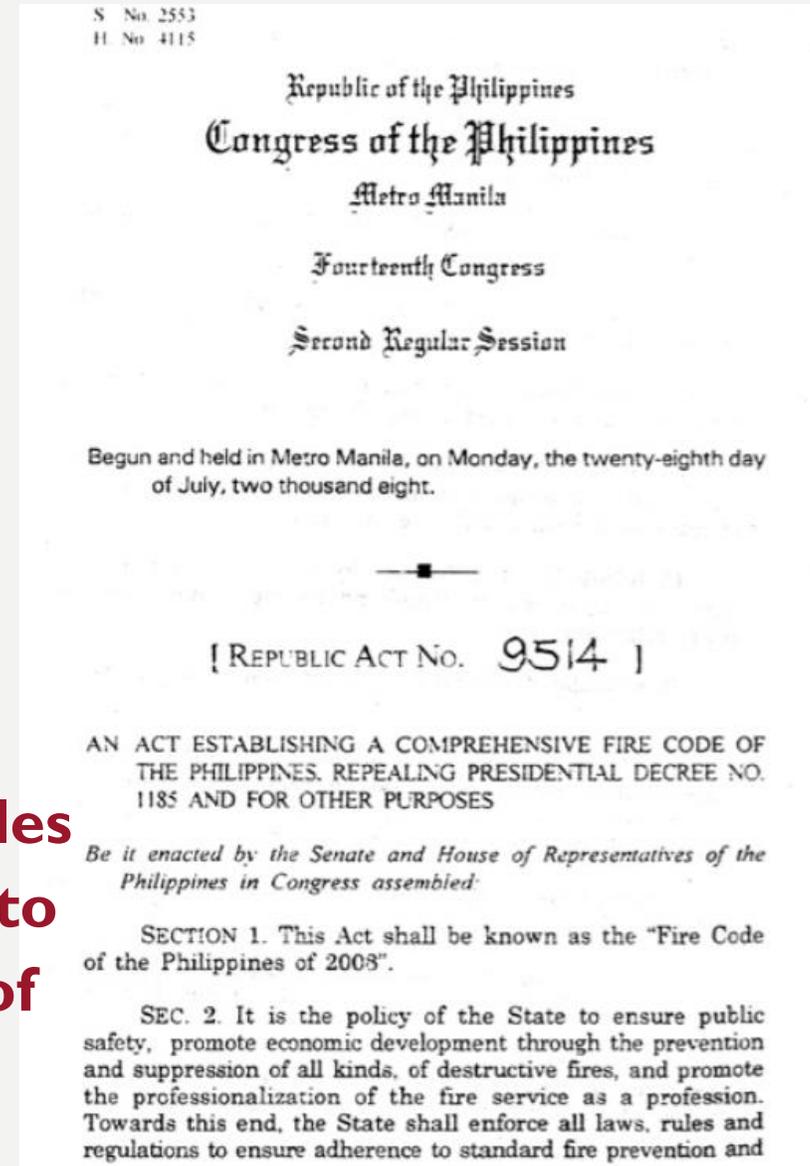
- National Building **Code** (1977) and its latest Implementing Rules and Regulations (2005) need to be fully reconciled with the various “referral codes.”
- Fire **Code** of the Philippines (2008) is treated as a “referral code;” but it is actually another act by Congress.
- National Structural **Code** of the Philippines (2015) is treated as another “referral code;” but it is actually a set of standards by the association of structural engineers.



EXAMPLE OF “REFERRAL CODE”

Fire Code of 2008;
Repealed PD 1185;
Implemented by another
national agency, BFP;
23 pp RA 9514;
475 pp IRR (2009)

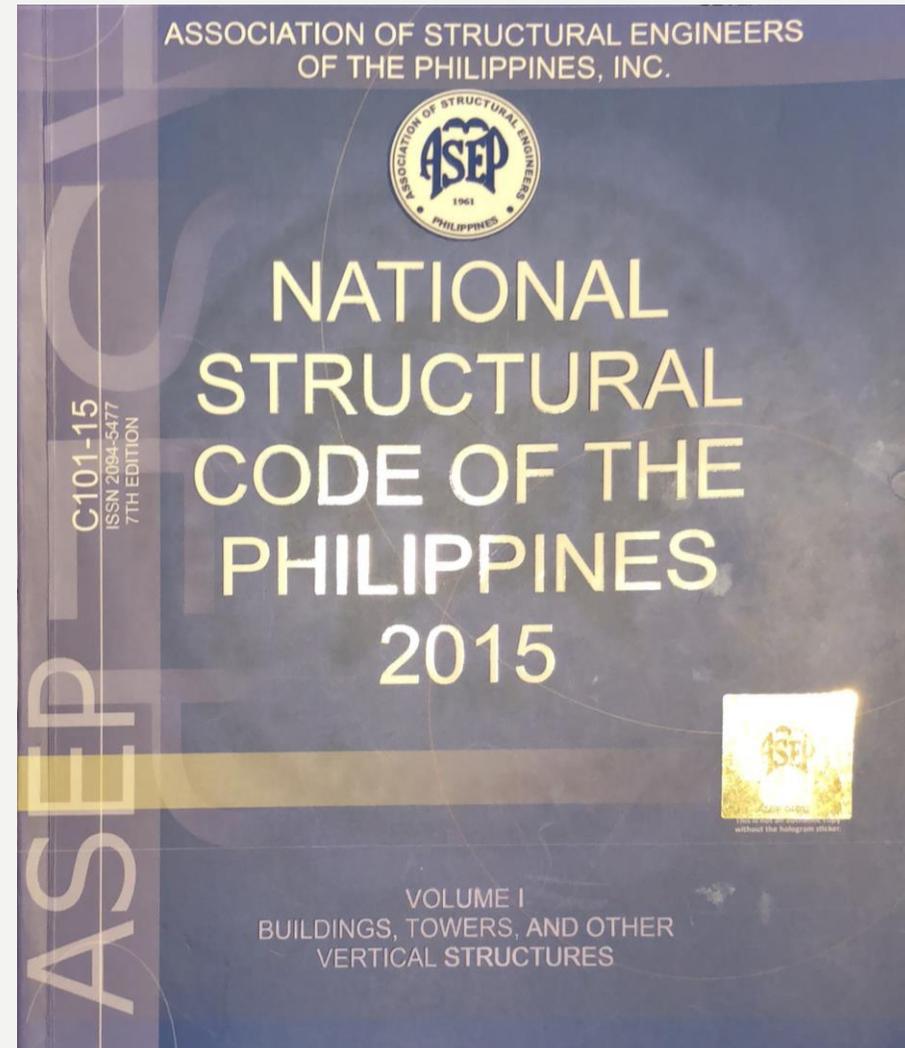
Issue: minimum required width of aisles for egress, which was “hardcoded” into the NBCP, is in conflict with the IRR of the Fire Code of 2008.



EXAMPLE OF “REFERRAL CODE”

NSCP 2015; 7th Edition;
Developed by the national
association of civil-
structural engineers, ASEP;
1,000 pp

**Issue: peer review of “special”
structures is not well provided
in the NBCP; but it is
prescribed in the NSCP.**



WHAT LONG-STANDING CONCERNS ?

- Building permit process: outdated? discretionary?
- Design of buildings: unconscious of multiple hazards?
- Old buildings: orphaned by professionals after 15 years
- Retrofit of old buildings: legal, admin, techno dilemma...
- Inter-agency and multi-sectoral council to review and update every five (5) years or sooner: needed yesterday!
- ...



WHAT LONG-STANDING CONCERNS ?



HOSPITAL HOTEL
Institutional Residential

OCTOBER 31, 2019 **M6.5**

OCTOBER 29, 2019 **M6.6**

OCTOBER 16, 2019 **M6.3**



WHAT LONG- STANDING CONCERNS ?

Do we have to wait for the perfect storm before we act?



HEADLINES

LGUs urged to review plans for 'perfect storm'

By: **Nestor Corrales** - Reporter / @NCorralesINQ

Philippine Daily Inquirer / 04:25 AM July 04, 2020



Local governments should review their disaster plans to anticipate a possible “perfect storm” of COVID-19 combining with the endemic problems of floods, landslides and diseases like diarrhea, influenza, leptospirosis and dengue, the Department of the Interior and Local Government (DILG) urged on Friday.

“We will have challenging days up ahead,” Interior Undersecretary Jonathan Malaya said weeks after the Philippine Atmospheric, Geophysical and



WE NEED THE REFORM TODAY, IN A NEW NORMAL, AND IN THE FUTURE.

- Philippine Development Plan 2017-2022: Chapter 20...
- Nat'l Econ & Dev't Authority: We agree... to reform the National Building Code [of 1977] in order to improve and update said legal **framework**, and make such more responsive and relevant to **current issues and developments**.
- **We: anticipate the emergent and the emerging.**



FRAMEWORK EXAMPLE: NZ

2004

- Building Act 2004*
- Building Regulations 1992 as partly revoked by Building (Forms) Regulations 2004, and amended in 2007, 2008, 2012

** Replaced the Building Act 1991*

- Building Code: Schedule 1 of Building Regulations

PROVENANCE

- ← • Legislative act
- ← • The Governor-General may make general regulations, and regulations, to be called the building code, that prescribe functional requirements for buildings and the performance criteria.
- ← • Standards and other materials are incorporated by reference.



FRAMEWORK EXAMPLE: JP

2014

- Building Standard Law: Law No. 201*
- Fire Service Law
- Regulations
- Building Codes

* Since 1950, last amended in 2014

PROVENANCE

- ← • Acts of parliament: procedures, penalties, outline technical requirements
- ← • Enforcement by the Ministry: detailed procedures
- ← • Notification by the Ministry: detailed technical requirements



FRAMEWORK REFORM: PH

1977

- National Building **Code**: PD 1096
- Other national legislations such as Fire **Code** of 2008
- Implementing Rules and Regulations
- Referral **Codes**

2020

- ➔ • Philippine Building **Act** of 2018 ...or 2019...or 2020
- Other national legislations such as Fire Code of 2008
- ➔ • **Implementing Rules and Regulations**
- ➔ • **Reference Standards**



WE NEED THE REFORM TODAY, IN A NEW NORMAL, AND IN THE FUTURE.

- Reform legally.
- Reform administratively.
- **Reform technologically.**
 - Prefer performance-based standards
 - Defer prescription-based standards



Office of the President to certify the Philippine Building Act of 2020 as urgent.

House and Senate of the Congress of the Philippines to approve and co-implement the Act reforming the system of regulations & standards for various types of public and private buildings in the country, proposed, existing, or old.

LEGISLATE

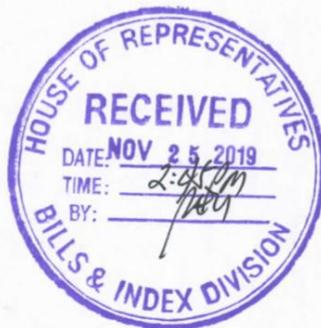
MAJOR REFORMS



Republic of the Philippines
HOUSE OF REPRESENTATIVES
Quezon City

EIGHTEENTH CONGRESS
First Regular Session

HOUSE BILL No. 5605



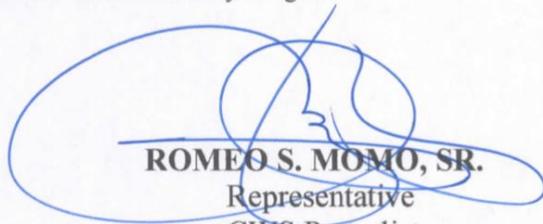
INTRODUCED BY CWS PARTY-LIST REPRESENTATIVE ROMEO S. MOMO, SR.

EXPLANATORY NOTE

Presidential Decree No. 1096 or the National Building Code of the Philippines was enacted to formulate and adopt a uniform building code which shall embody up-to-date and modern technical knowledge on building design, construction, use, occupancy and maintenance. However, since its enactment in 1977, no amendments or modifications were introduced to cope up with the technological advancements in the construction industry and likewise the unpredictable changes in our environment and natural disasters.

Thus, it is imperative that we introduce a new National Building Code which shall provide a better framework of minimum standards and requirements that are needed in the regulation and control of building construction in terms of location, site, design, quality of materials, construction, use, occupancy and maintenance that is more relevant and appropriate.

With these foregoing reasons, passage of this bill is earnestly sought.


ROMEO S. MOMO, SR.
Representative
CWS Party-list

H.B. 5605

H.B. 175

H.B. 1891

H.B. 238

H.B. 4008

H.B. 364

H.B. 5605

H.B. 723

H.B. 6820

H.B. 825

H.R. 32

H.B. 923

H.R. 132

H.B. 1650



EIGHTEENTH CONGRESS OF THE REPUBLIC }
OF THE PHILIPPINES }
First Regular Session }

'19 DEC 17 A8:45

RECEIVED BY: _____



SENATE
Senate Bill No. **1239**

Introduced by **SENATOR LACSON**

**AN ACT
ESTABLISHING THE PHILIPPINE BUILDING ACT OF 2019, THEREBY
REPEALING PRESIDENTIAL DECREE NO. 1096, AND FOR OTHER
PURPOSES**

EXPLANATORY NOTE

Since Presidential Decree No. 1096, otherwise known as the National Building Code of the Philippines, was signed into law in 1977, it has been the guiding document for buildings and structures in the Philippines. Over the years, amendments and related laws and regulations have been created to improve and enhance the efficacy of its implementation. One example of such is the enactment of the Fire Code of the Philippines in 2008, which aimed to refresh standards that further ensure public safety and economic development through the prevention and suppression of all kinds of destructive fire.

Despite all existing regulatory measures related to this end, experience tells us that there is an urgent need to strengthen the overall policy on how buildings and structures are built in the country. Not to mention the country's geographical

S.B. 1239

S.B. 1239

S.B. 1252



MAJOR LEGAL REFORMS

- Streamline building permit process
- Design buildings to be more resilient against multiple hazards, including evacuation buildings
- Assess old buildings, every 15 years
- Incentivize retrofit of old buildings
- Create inter-agency and multi-sectoral **Building Regulations and Standards Council (BRSC)** to review and update every five (5) years or sooner



Simple structures like ordinary houses and small buildings need only follow a set of predetermined guidelines before getting a permit, thereby reducing fees and shortening the process.



**Building
owner**

**Building
official**

SIMPLER FOR SIMPLE BUILDINGS

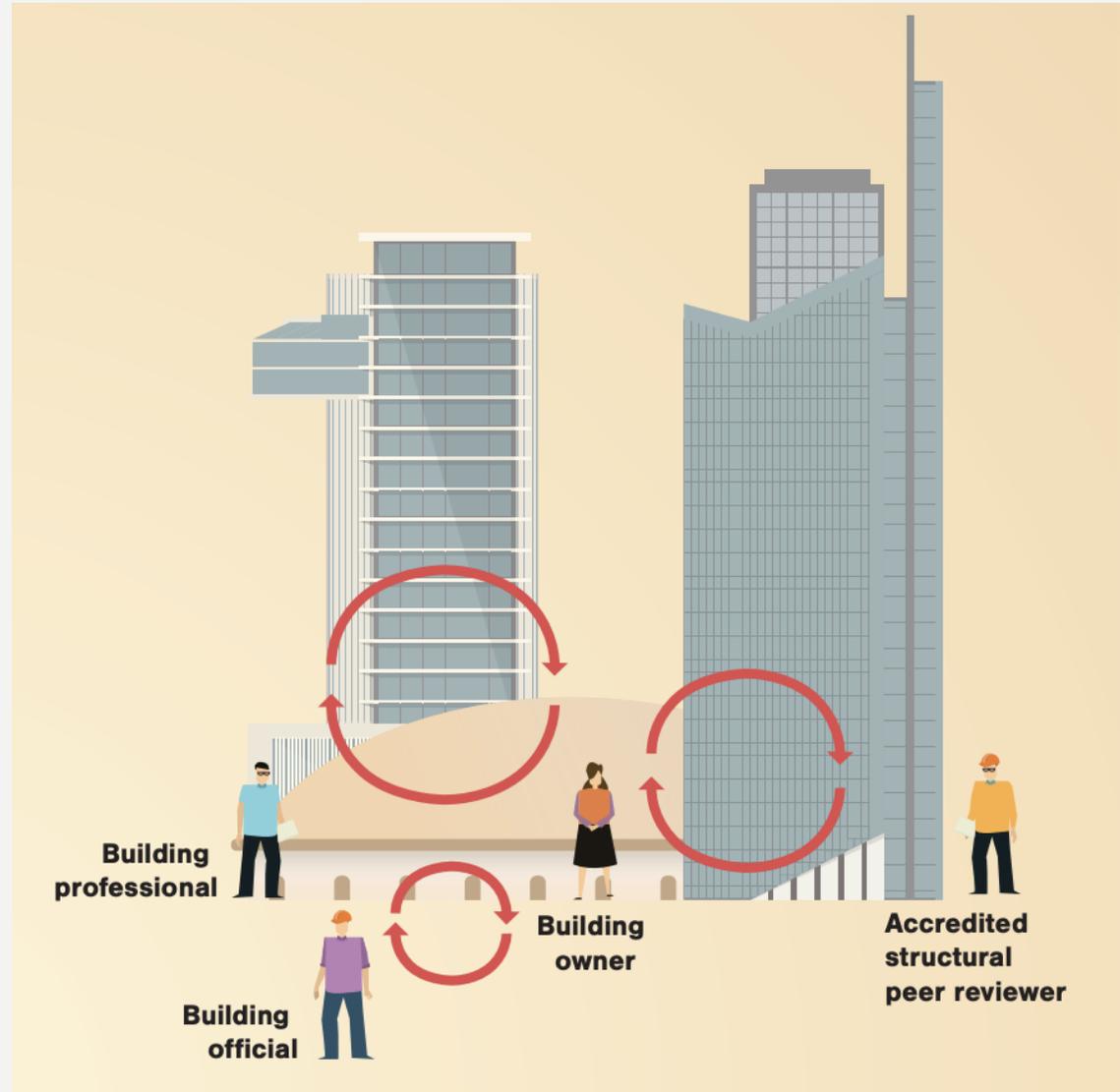
Include those in the regulation.

Do not exempt, nor take those for granted.



MORE COMPLICATED FOR SPECIAL BUILDINGS ONLY

Provide clear criteria for
classifying buildings as special.



STREAMLINE BUILDING PERMIT PROCESS

The Act adds a new building classification in order to streamline the permit process.

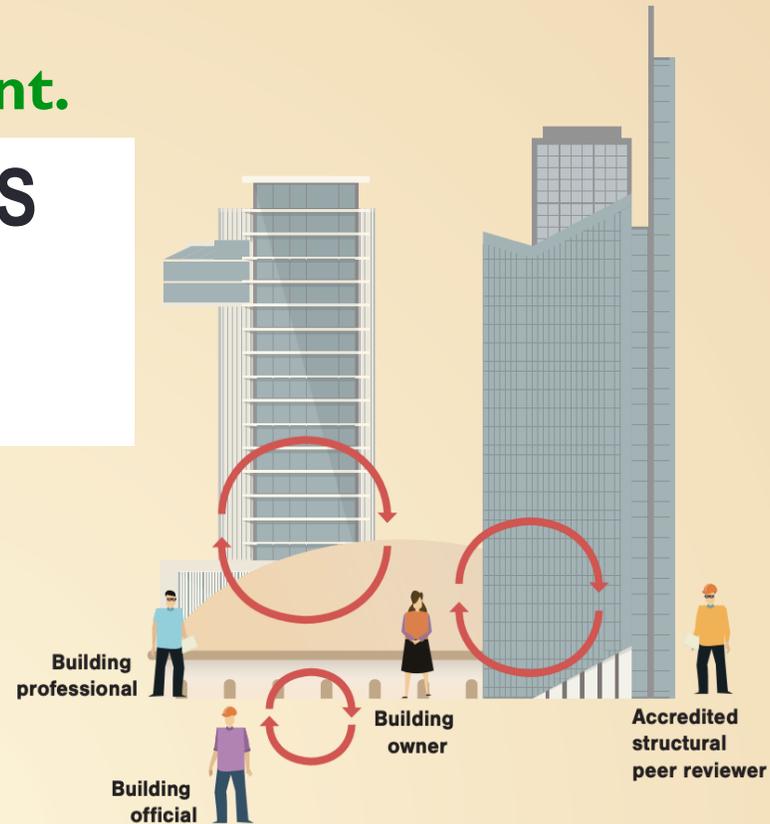
Simple structures like ordinary houses and small buildings need only follow a set of predetermined guidelines before getting a permit, thereby reducing fees and shortening the process.



Building owner Building official



Building professional Building owner Building official



Building professional

Building owner

Accredited structural peer reviewer

Make more transparent.

REGULAR PROCESS FOR REGULAR BUILDINGS

Special structures meant to be occupied by large groups of people need an additional peer review process to ensure structural stability, making sure our buildings are more safe.



MAJOR LEGAL REFORMS

- Streamline building permit process
- Design buildings to be more resilient against multiple hazards, including evacuation buildings
- Assess old buildings, every 15 years
- Incentivize retrofit of old buildings
- Create inter-agency and multi-sectoral **Building Regulations and Standards Council (BRSC)** to review and update every five (5) years or sooner



Dept. of Public Works and Highways and Dept. of Interior and Local Government to engage partner government agencies and private sectors in crafting and updating periodically the regulations and standards for buildings, mainstreaming disaster risk reduction and management.

EXECUTE PARTNERSHIPS



KEY AGENCIES

- **Dept. of Public Works and Highways**
- Dept. of Human Settlements and Urban Development
- Professional Regulation Commission
- **Dept. of Interior and Local Government**
- Dept. of Trade and Industry
- Dept. of Environment and Natural Resources
- **Dept. of Science and Technology**
- ...



Dept. of Science and Technology and National Economic and Development Authority to collaborate across agencies and sectors in the compliance with building regulations and standards and the enforcement of the same, infusing with research and development in particular and a culture of science, technology, and innovation in general.

COLLABORATE IN COMPLIANCE + ENFORCEMENT



WHO ARE RESPONSIBLE ?

1977

- Owner or Developer
- Official

2020

- Owner or Developer
- Professional
- Contractor
- Official

Liabilities are proportionate to the size and cost of the building project.



EQUAL COLLABORATORS

- **Educators and Researchers (in BRSC)**
- **Representatives-at-Large (in BRSC)**
- Building Owners, Developers, Managers, Administrators
- Building Professionals
- Building Contractors
- Building Officials

Regulations and standards are dependent on advancing knowledge, skill and attitude. Buildings are the most basic social infrastructure.



IS THERE ROOM FOR SCIENCE, TECHNOLOGY AND INNOVATION ?

- **Yes, not just a room but a whole building !**
- Safety, security, health, comfort, **and many more !**
- Water **conservation**
- Energy **conservation and generation**
- Food **production**
- Waste or pollution **minimization**
- **Information and communication**



IS THERE ROOM FOR SCIENCE, TECHNOLOGY AND INNOVATION ?

- **Information and communication: ubiquitous**
- Online database of documents: all buildings
- Building information management system as tool for maintenance: most buildings
- Earthquake recording instruments: special buildings
- Virtual twin for digital monitoring: very special buildings
- ...



SUMMARY

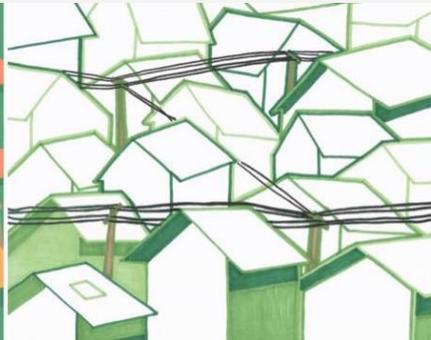
- After 43 years of history of nationwide regulation of buildings, we need major reforms in order to reduce mortalities, economic losses, and social infrastructure disruptions.
- Five (5) major reforms and numerous others are geared towards balancing regulation and innovation, while aiming for sustainable development.



SHELTER

most basic infrastructure

CULTURE OF
SCIENCE,
TECHNOLOGY
AND
INNOVATION



Day 3



Riyanti Djalante

Academic Programme Officer
at United Nations University -
Institute for the Advanced
Study for Sustainability
(UNU-IAS)

Science and Policy



Benito M. Pacheco

Professor at the Institute of
Civil Engineering,
University of the Philippines
Diliman

Regulating Buildings



John Rundle

Distinguished Professor,
Physics and Earth & Planetary Science,
University of California, Davis

Forecasting and Nowcasting

THANK YOU FOR JOINING!
riskguide101@up.edu.ph

