

International Conference on Fourth Industrial Revolution Technologies for Sustainable Development

30 November 2021
New Delhi, India
(Virtual)

***“Harnessing 4IR technologies
for sustainable and smart cities”***

By Kok-Chin (KC) TAY
Chairman, Smart Cities Network
Director (ASEAN), Smart Cities Council



A Note of Acknowledgement and Appreciation

Jointly Organized by

and

**Asian and Pacific Centre for Transfer of Technology (APCTT) of
the United Nations Economic and Social Commission for Asia and
the Pacific (ESCAP)**

**Department of Scientific and Industrial Research (DSIR),
Ministry of Science and Technology, Government of India**

Greetings to Esteemed Speakers below and fellow Speakers

1. **Dr. Preeti Soni** - Head, Asian and Pacific Centre for Transfer of Technology, UN ESCAP
2. **Dr. Shekhar C. Mande** - Secretary, Department of Scientific and Industrial Research (DSIR), and Director General, Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, Government of India
3. **Dr. Armida Salsiah Alisjahbana** - Under-Secretary-General and Executive Secretary of the UN ESCAP
4. **Dr. Rajiv Kumar** - Vice Chairman, NITI Aayog (National Institution for Transforming India), Govt of India

11:30-12:45

BREAKOUT SESSION II: 4IR technologies for climate change mitigation and clean energy

This breakout session will deliberate on enabling policies and strategies to harness 4IR technologies to reduce Greenhouse gas (GHG) emissions and shift towards clean energy sources. The experts will share experiences, good practices, and case studies for climate change mitigation by harnessing 4IR technologies.

Chair: Mr. Jagjeet Singh Sareen, Assistant Director General, International Solar Alliance (ISA), India

11:30-11:45	Accelerating clean energy innovations and applications through investments in emerging technologies	Mr. Jagjeet Singh Sareen Assistant Director General, International Solar Alliance (ISA), India
11:45-12:00	Enabling policies and strategies to promote 4IR technologies for climate change mitigation in Asia-Pacific	Dr. Venkatachalam Anbumozhi Director - Research Strategy and Innovation, Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia
12:00-12:15	Harnessing 4IR technologies for sustainable and smart cities	Mr. Kok-Chin Tay Chairman of the Smart Cities Network, Director for Smart Cities Council ASEAN, Singapore

4th IR - Making sure we are on the same page

The **First Industrial Revolution** used water and steam power to mechanize production.

The **Second** used electric power to create mass production.

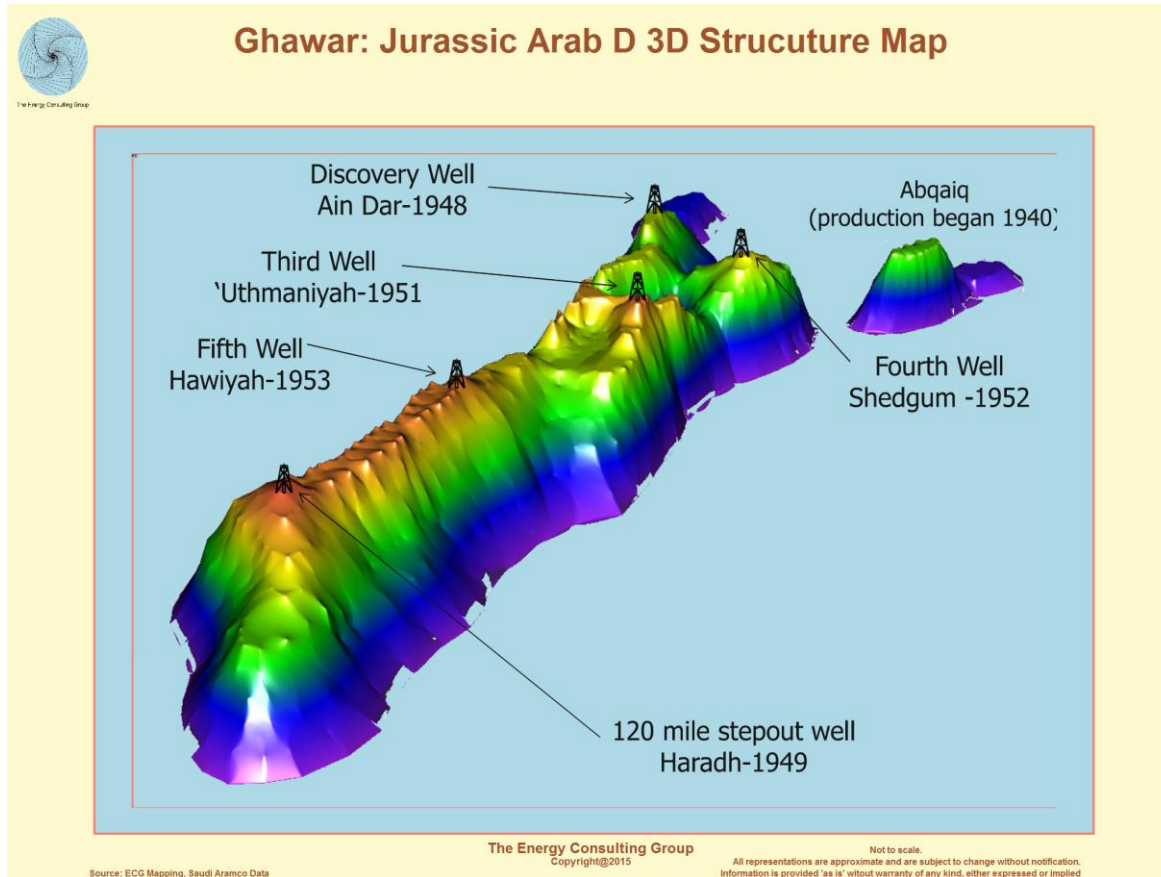
The **Third** used electronics and information technology to automate production.

Now a **Fourth Industrial Revolution** is building on the Third, the digital revolution that has been occurring since the middle of the last century.

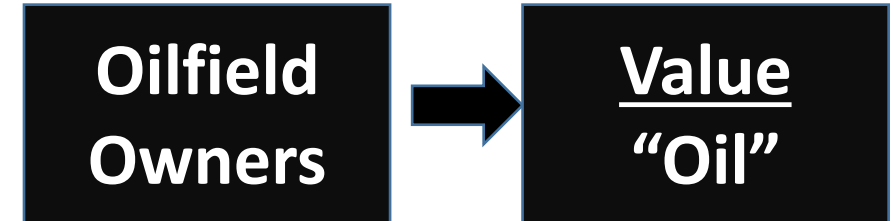
It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.

<https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

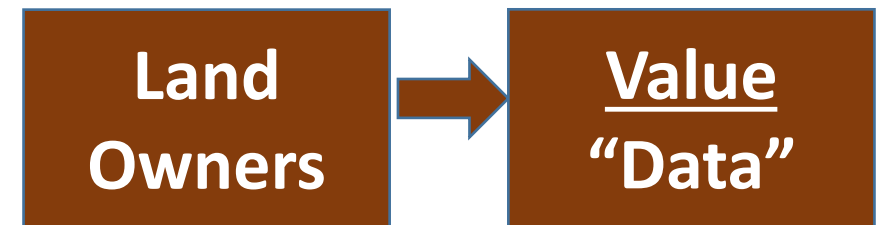
Digital Twin – the Fusion of Technologies & Knowledge



The Digital Twin for Oilfields



The Digital Twin for Smart Cities



"Data" is the "New Oil"

<http://energy-cg.com/OPEC/SaudiArabia/Ghawar/>

OPEC_SaudiArabia_Ghawar_JuArabDS3DStrucMap_Jul15_Image1x1.png_EnergyConsutlingGroup_web.png

Global Trends of Smart City Solutions

A Survey of 167 Cities

ESI THOUGHTLAB

We surveyed decision-makers in 167 cities



Smart City Solutions for a Riskier World

How innovation can drive urban resilience, sustainability, and citizen well-being



www.esithoughtlab.com

Sponsored by



Advisory board

Advisors

Name

KC Tay

Chairman

Smart Cities Network

ESI ThoughtLab is an innovative thought leadership and economic research firm providing fresh ideas and evidence-based analysis to help business and government leaders cope with transformative change.

We specialize in analyzing the impact of technological, economic, and demographic shifts on industries, cities, and companies.

ESI ThoughtLab is the thought leadership arm of Econsult Solutions, a leading economic consultancy with links to the academic community.

Q16: In which of the following digital technologies and solutions has your city made large investments and in which will you make large investments over the next three years?

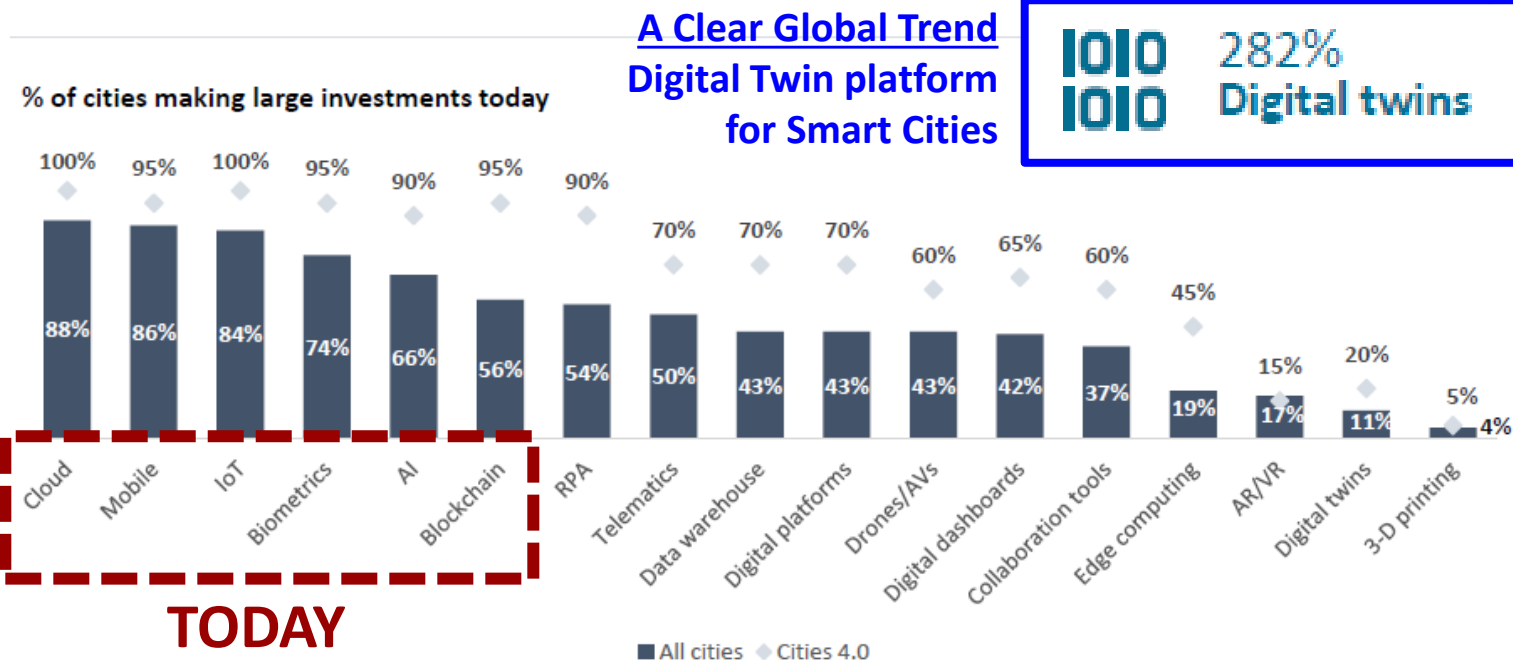
3. Technology: Placing the right bets

Cities are adopting a wide array of smart technologies, especially cloud, mobile, IoT, biometrics, and AI.

Cities 4.0 are moving even faster to leverage advanced technologies: 100% have made hefty investments in cloud and IoT, and slightly fewer are spending significantly on mobile, biometrics, blockchain, AI, and RPA.

Over the next three years, cities plan to increase investments significantly in digital twins, 3-D printing (off an extremely small base), data warehouses, augmented and virtual reality, blockchain, digital dashboards, and drones. The share of cities making large investments will jump the most for digital twins, from 11% today to 31% in three years—a rise of almost 300%. For Cities 4.0, the increase in digital twins will be even greater, from 20% today to 70% in three years.

% increase in cities making large investments over next 3 years



“Smart technology, data, and analytics will need to be translated into new sustainable economic and environmental policies. AI and analytics-based solutions providing real-time and predictive information will be key alongside having better data and multiple data sources.”

William Bayer, Vice President, Smart Platform, NTT

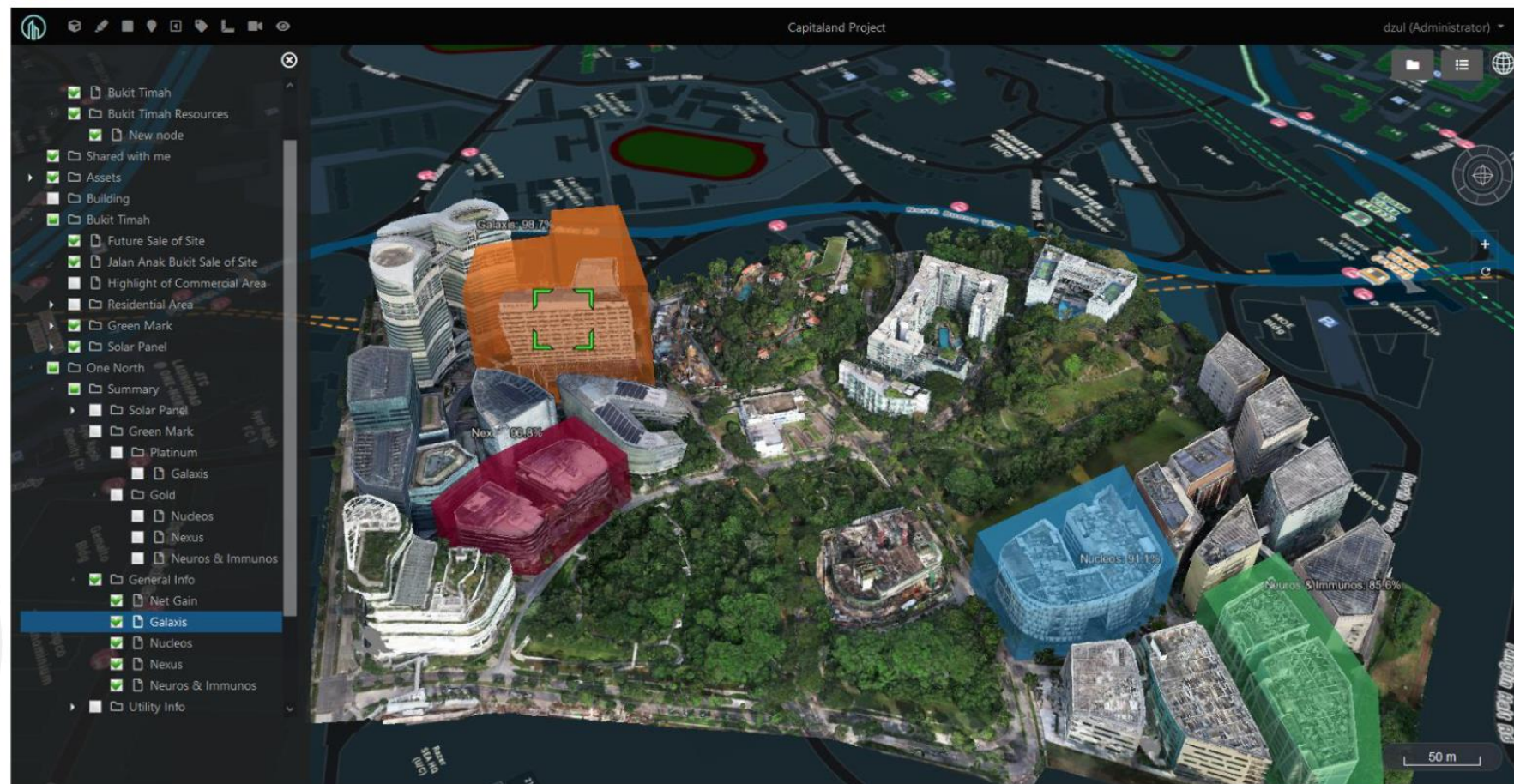
Q16: In which of the following digital technologies and solutions has your city made large investments and in which will you make large investments over the next three years?

Characteristics of a Digital Twin

- Digitally Accurate
- High Resolution
- Covers an Area
- Contains Useful Data
- Able to Use (hence the need to develop relevant **Use Cases**)
- **Develop the Digital Twin of the City and then start to develop the Use Cases**



What are Digital Twins of cities ?

Urban digital twins are a virtual representation and exact replica of a physical city.



Slide from Seok Mei of United Cities, "Digital Twins for UN SDG 11" presentation, July 2021

Urban Digital Twins for Smart Cities and Citizens: The Case Study of Herrenberg, Germany

Fabian Dembski ¹, Uwe Wössner ¹, Mike Letzgus ², Michael Ruddat ³ and Claudia Yamu ^{4,*}

Example Smart City

This should be the first 4IR Use Case for any Digital Twin of a Smart City

Why Develop a Digital Twin for a Smart City?

*“The results of a survey indicated that this method and technology **could significantly aid in participatory and collaborative processes.***

Further understanding of how urban digital twins support urban planners, urban designers, and the general public

Fundamental 4IR Use Case

1. **as a collaboration and communication tool and**
2. **for decision support allows us to be more intentional when creating smart cities and sustainable cities with the help of digital twin.”**

Figure 4. The urban digital twin for Herrenberg in a mobile VR during a participatory process in Herrenberg (photo credited to Dembski, 2019).

<https://www.researchgate.net/publication/339974499> Urban Digital Twins for Smart Cities and Citizens The Case Study of Herrenberg Germany

Helsinki is Building a Digital Twin of the City

Example Smart City

Aarni Heiskanen | Posted on April 15, 2019



The capital of Finland first tested city modeling as long back as 1987. But the most recent model of the Kalasatama district demonstrates the new state-of-the-art possibilities of this technology: creation of a highly accurate digital twin of the city.

<https://aec-business.com/helsinki-is-building-a-digital-twin-of-the-city/>

Why Develop a Digital Twin for a Smart City

“Helsinki 3D+ is not a traditional city survey or planning service.

Use Case to Collaborate

*It is a tool that **can collaborate across all multiple functions of the city** for whenever the use of a city model could provide value.*

*Suomisto mentions **education and social services** as two examples. “City models are not just PR. They have a role to play in **solving universal urban problems**,” he says.”*

Example Use Cases to Collaborate



Shabana Begum

September 2021

PUBLISHED SEP 9, 2021, 6:36 PM SGT

<https://www.straitstimes.com/singapore/environment/spore-uses-virtual-twins-and-geographic-tech-to-monitor-activities-and-plan>

“SINGAPORE - Dotted with ships and fish farms, and teeming with marine life, the seas surrounding Singapore contain a treasure trove of information, some of it invisible to the naked eye.

*The information includes details about **the seabed, the status of desalination plants and marine water quality.**”*

S'pore using 'virtual twins' of land and sea to monitor activities and plan projects



.To make such data available to government agencies here, the Maritime and Port Authority of Singapore (MPA) started developing a repository of land, marine and coastal data in 2019.

This virtual twin of Singapore's land and coastal waters - called **GeoSpace-Sea** - can map out and present data in 2D and 3D forms for the authorities to monitor coastal and sea activities in real-time, or plan building projects

TECHNOLOGY

Facebook rebrands as Meta in bid to shift focus to the 'metaverse'

U.S. tech giant says it is expanding 'beyond' social apps



Facebook CEO Mark Zuckerberg announces the social networking company's new name, Meta, in this screenshot from a Oct. 28 presentation.

YIFAN YU, Nikkei staff writer
October 29, 2021 04:23 JST

The **metaverse** is a hybrid world of online social experiences, sometimes expanded into **three dimensions** or projected into the physical world.

Augmented Reality (AR)

Facebook already owns the virtual reality business Oculus and is building out augmented reality games, virtual offices and interactive fitness programs.

"We have a new name that reflects the full breadth of what we do and the future that we want to help build," said Zuckerberg.

<https://asia.nikkei.com/Business/Technology/Facebook-rebrands-as-Meta-in-bid-to-shift-focus-to-the-metaverse>

Capacity Building of ASEAN Leaders about Smart Cities

Workshop on Digital Twin Digital Connectivity for Smart Cities 6th July 2021



<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

The Rise of Natural Disasters in Asia and the Pacific



Learning
from ADB's
Experience

A Major Regional Problem

Heavy Burden on Asia

“Asia suffers the brunt of the world’s disasters.

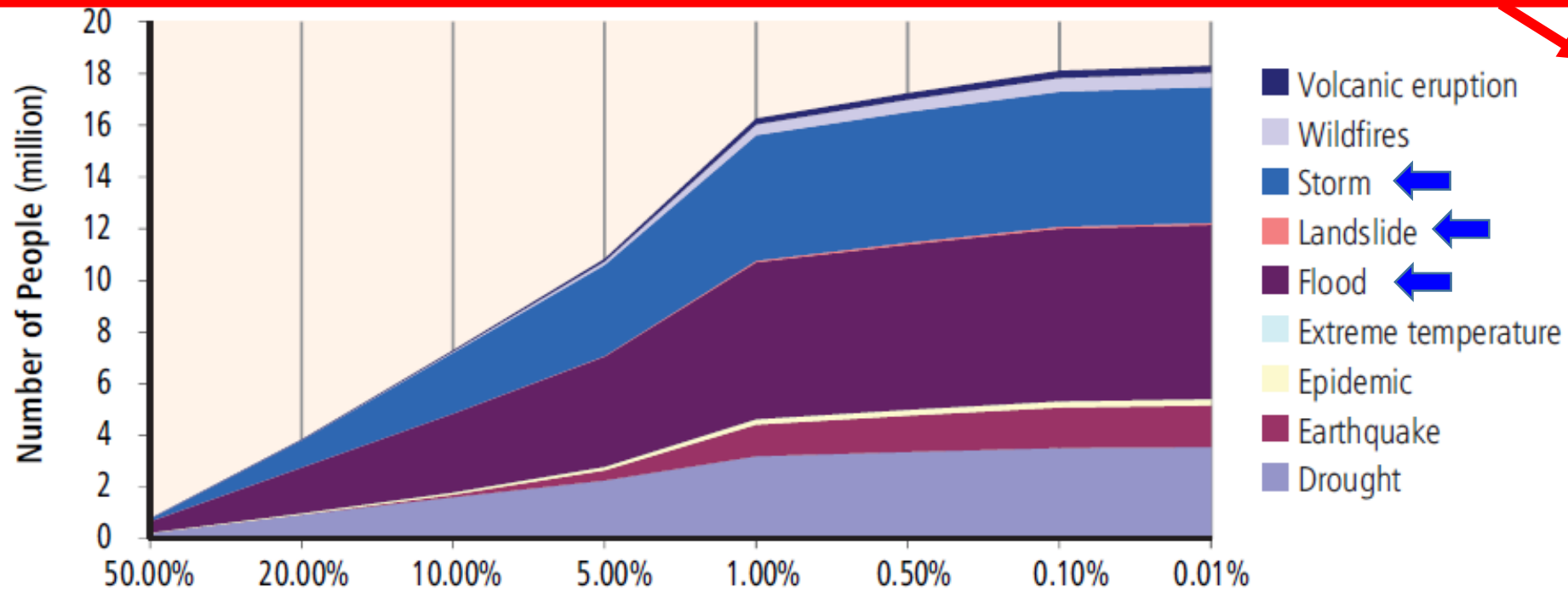
*According to EM-DAT, the region accounted for half of the estimated economic cost of disasters in the world over the past 20 years, or **\$927 billion in Asia** (more than **\$40 billion annually on average**) and **\$956 billion** outside of Asia.*

While the region generated almost 25% of the world’s gross domestic product (GDP) during 1980–2009, it accounted for 38% of global economic losses due to natural disasters in that period.”

<https://www.adb.org/sites/default/files/evaluation-document/36114/files/rise-natural-disasters-asia-pacific.pdf>

Number of People Affected by Natural Disasters

Figure 5: Number of People Affected in Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, the Philippines, Thailand, and Viet Nam (by Disaster Type)



South-East Asian Nations are the worst hit in the world

Source: Computed from data from the Centre for Research on the Epidemiology of Disasters. Emergency Events Database. <http://www.emdat.be/>.

<https://www.adb.org/sites/default/files/evaluation-document/36114/files/rise-natural-disasters-asia-pacific.pdf>

Collaboration with the Philippines



Local (One City)



Region (ASEAN)



Global

The Genesis (with Cauayan City) Disaster Risk Reduction and Management

“..the origin or mode of formation of something”

The Chance Meeting in August 2018 in Singapore



Meeting between Mayor Bernard Faustino M. Dy (on the right) of Cauayan City, Philippines and Kok-Chin TAY from Smart Cities Network, both speakers at the Urban Regeneration Event in August 2018 in Singapore. Both agreed to have a Workshop at Cauayan City later that year.



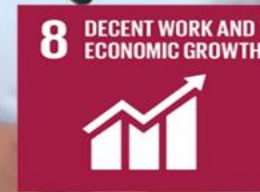
REPUBLIC OF THE PHILIPPINES
Province of Isabela
CITY OF CAUAYAN

**A Champion for the
localization of the
UN SDGs**

**HON. BERNARD FAUSTINO M. DY
CITY MAYOR**



SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR CITY



The 1st Workshop and MOU Signing in Jan 2019





MEMORANDUM OF UNDERSTANDING

**Signed on
25th Jan 2019**

1. To encourage the proactive, innovative, ecosystem and entrepreneurial approach towards **creation and development of training programs** to collaborate with cities in the Philippines to develop As Smarter and Sustainable Cities;
2. To help **cities in the Philippines** to better understand what it takes for the city to be ready to become “Smart Cities;” and
3. To collaborate with the **Smart Cities Council** for their Readiness Program by jointly taking the approach to key stakeholders, sponsors and investors and extending support in **planning, design and implementation of Smarter and Sustainable Cities in the Philippines.**

MOU Duration: Jan 2019 – Dec 2021

The 2nd Workshop on Smart Cities Activator in Jun 2019 with reps from Cauayan City, Isabela State University, DOST and LCP



The Workshop was hosted by Cauayan City LGU – to learn how to use the Smart Cities Activator (to define Projects) by Smart Cities Council.



Local (One City)



Region (ASEAN)



Global

How we sustained the Partnership with Cauayan City

- 1. Promoted the City on Global platforms (WeGo & AWS)**
- 2. Seek for Funding**

*“**World Smart Sustainable Cities Organization (WeGO)**, is an international association of city and other local governments, smart tech solution providers, and national and regional institutions committed to the **transformation of cities into smart sustainable cities.**”*

April 3, 2020

Cauayan City selected as beneficiary of Project Implementer 2020

SEOUL – WeGO has selected Cauayan City, Philippines, as the beneficiary local government of the Project Implementer 2020 for its project proposal toward developing a data dashboard to minimize the impact of tropical storms on the city.

<http://we-gov.org/news-2020/cauayan-city-selected-as-beneficiary-of-project-implementer-2020/>

The City was recognized as a **GLOBAL LEADER as a Smart Sustainable City by WeGO**

Cauayan City selected as beneficiary of Project Implementer 2020

In April 2020

April 3, 2020

developing a data dashboard to minimize the impact of tropical storms on the city.

SEOUL – WeGO has selected Cauayan City, Philippines, as the beneficiary local government of the Project Implementer 2020 for its project proposal toward developing a data dashboard to minimize the impact of tropical storms on the city.

Formerly branded as the “Smart Sustainable City Feasibility Study Program,” or “F/S,” WeGO’s Project Implementer aims to implement pilot projects that align with local and national development goals. For each selected submission, WeGO sponsors the services from a consultant and solution provider with the needed expertise, up to an amount of approx. USD 92,000. In turn, local governments are required to contribute both financially and in kind toward further expansion of the project.

This year’s request for proposals (RFP) under the theme of “Enabling Better Decision-Making Through Digital Infrastructure” sought to attract projects related to building infrastructure that enables better decision-making by involving not just governments, but citizens and business as well, in an intelligent connected ecosystem.

Among the 12 submissions from local governments across Africa, Asia, and Latin America, Cauayan City’s proposal stood out for its focus on crisis management, an essential skill for all levels of government in confidently navigating through series of disruptive and unexpected events including the COVID-19 pandemic. By developing a Digital Twin Data Dashboard integrated to a CCTV system, the city expects to better cope with tropical storms and expand its national resilience network, resulting in improved disaster management and increased citizen wellbeing.

<http://we-qov.org/news-2020/cauayan-city-selected-as-beneficiary-of-project-implementer-2020/>

*WeGO sponsors the services from a consultant and solution provider with the needed expertise, up to an amount of approx. **USD 92,000.***

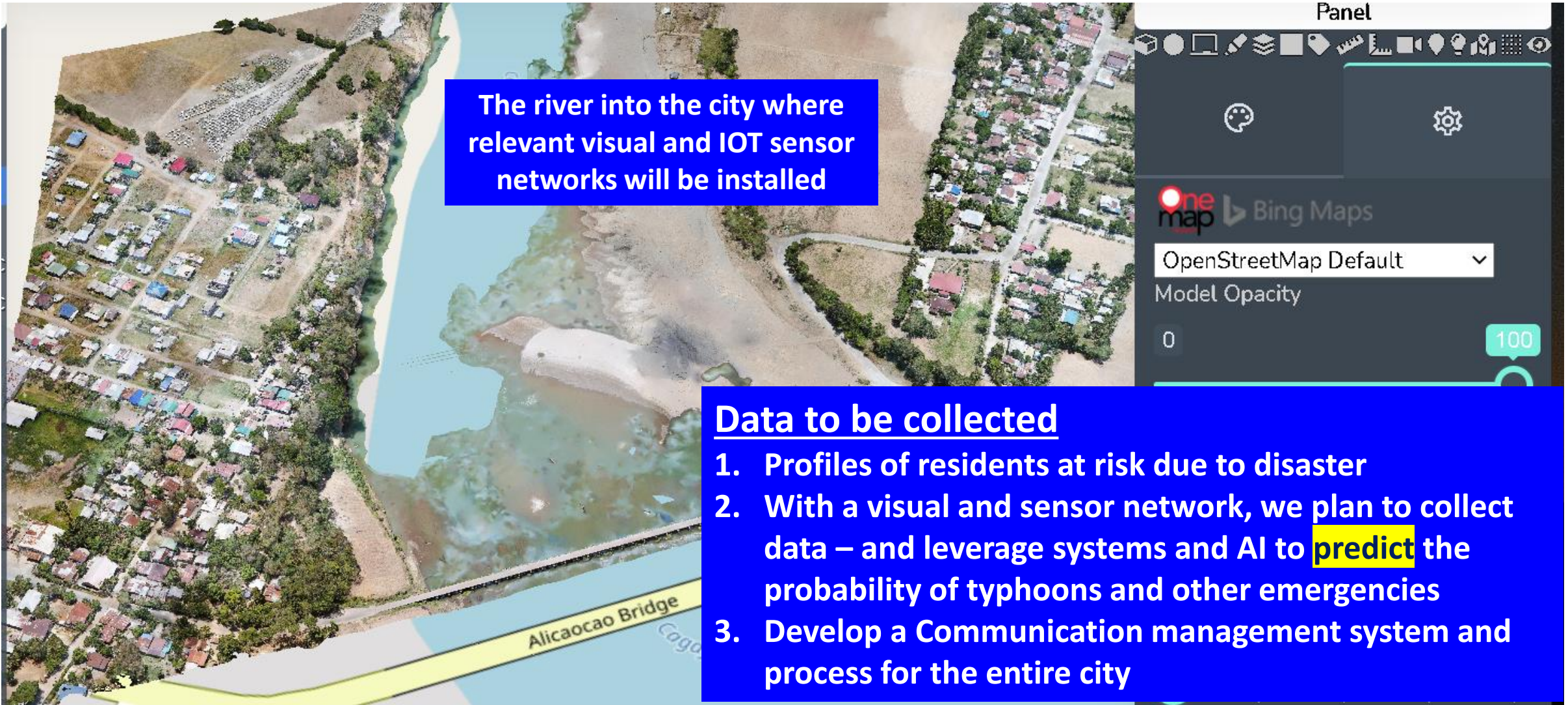
*developing a **Digital Twin Data Dashboard** integrated to a CCTV system, the city expects to better cope with tropical storms and expand its national resilience network, **resulting in improved disaster management and increased citizen wellbeing.***

Digital Twins of Cauayan City – Prototype for Disaster Preparedness



Screenshot of the Digital Twin of Cauayan City from the Graffiquo Digital Twin Platform

Digital Twins of Cauayan City – Prototype for Disaster Preparedness

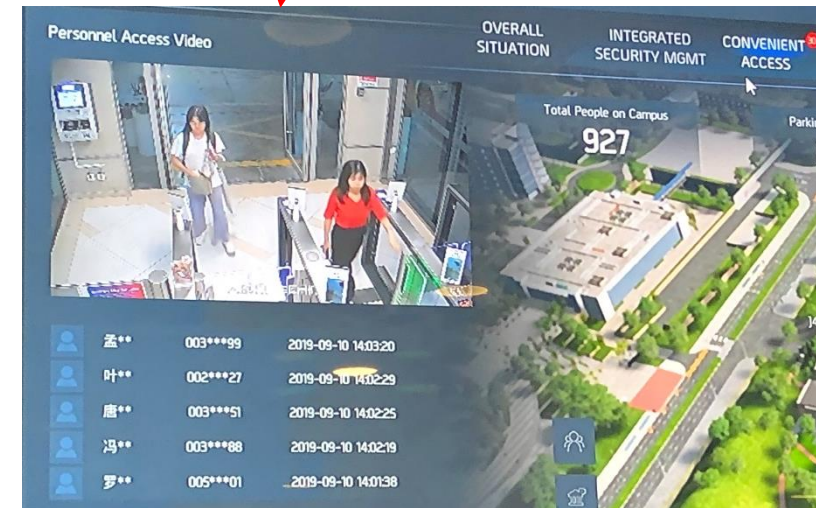


Screenshot of the Digital Twin of another part of Cauayan City near the river and sea



**The Huawei Demo
Command Centre,
Singapore**

Integration with CCTV



Source: Photo by KC Tay on a visit to the Centre on 29th Nov 2021

AWS City on a Cloud Challenge 2020

Winners

The AWS Gamechangers Award

When powered by modern technology, bold ideas can make a major impact on communities. If you have a great idea that you would like to implement in your city, we encourage you to submit it in the AWS Gamechangers Award category. Qualified entries will be judged on the following criteria:

1. Innovation: Expanding access to goods and services in an innovative way
2. Feasibility of the plan for implementation
3. The likely impact of the solution for the local community and its furtherance of the public interest
4. Adherence to the competition theme and the integration of AWS services to provide this solution

<https://aws.amazon.com/government-education/worldwide/city-on-a-cloud/results/>

AWS City on a Cloud Challenge 2020

Winners

Graffiquo - Singapore

The AWS Gamechangers Award

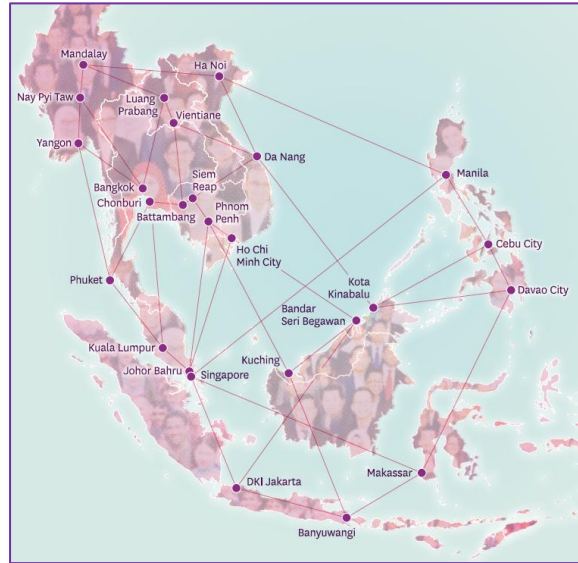
The Project for Cauayan City was recognized by AWS as a GLOBAL GameChanger

Seven typhoons hit Cauayan City in 2019. This affected hundreds of households and caused massive production losses in rice and corn. A lot of this damage can be attributed to the insufficiency of early warning systems, and in particular, a lack of a map and monitor for the most at-risk areas. At the start of 2020, Cauayan City, through its partnership with Smart Cities Network and with the assistance of Graffiquo, was able to create the first Integrated Digital Twin System for disaster resiliency. The Integrated Digital Twin project is a system that contains a 3D digital map of flood-prone areas of Cauayan City, Philippines. A 3D digital map generates an interactive display of the most flooding prone areas. Using AI solutions and data analytics, they can provide accurate city profiling of land area, infrastructure, bridges, houses, and population density without needing to physically visit. It can also accurately predict where and when flooding will occur by monitoring things like soil erosion and river height. This two-pronged approach allows them to predict floods before they happen, as well as accurately predict the possible damage caused, and how emergency services respond. This not only saves lives in terms of immediate flooding response but also dramatically increases quality of life, as they can act before the event actually occurs.

<https://aws.amazon.com/government-education/worldwide/city-on-a-cloud/results/>



Local (Region II)



Region (ASEAN)



Global

From Cauayan City to Cagayan Valley Smarter City Belt

- 1. Supported the Launch on 23rd March 2021 by DOST Region 2**
- 2. Promoted the Leading Cities (Cauayan City and Tuguegarao City) in an ASEAN event**
- 3. Capacity Building for Cagayan Valley stakeholders (Sep till Nov 2021)**
- 4. Introduced both Leading cities into a Global Network (Resilient Cities Network)**

Aspirations of the Cagayan Valley Smarter City Belt

The Cagayan Valley Smarter City Belt

Launched on 23-March-2021

*Exploring New Growth through Innovation and Nurturing Engagement
of Smart Solutions (ENGINES)*

**March
2021**

The concept of the Cagayan Valley Smarter City Belt is aimed to build the “Belt” and “Road”, meaning more connectivity through the region, and later on with the other Smarter Cities in the country and perhaps, a catalyst for international collaborations with our ASEAN neighbors.

In a nutshell, the Cagayan Valley Smarter Belt is an ecosystem of cities in Region 02 with different strengths, with different weaknesses, and they learn to collaborate and not to compete or combat with each other along the road and their becoming more resilient in the future is because they have the support of all their partner smart cities along the road.

Provinces of Cagayan Valley Smarter City Belt in Region II



<https://www.philatlas.com/luzon/r02.html>

Name	Population (2020)	Area (2013) ₂ in km ²	Density (2020) ₂ per km ²	City count	Mun count	Brgy count
Batanes	18,831	203.22	93	0	6	29
Cagayan	1,268,603	9,398.07	135	1	28	820
Isabela	1,697,050	13,102.05	130	3	34	1,055
Nueva Vizcaya	497,432	4,813.88	103	0	15	275
Quirino	203,828	2,319.66	88	0	6	132

Total Population: 3,685,744



The Partnership with Cagayan Valley

1. A chance meeting in Aug 2018 has developed into a friendship to become a catalyst for the development of the CAGAYAN VALLEY SMARTER CITY BELT in 2021
2. The plan is to help develop the Cagayan Valley Smarter City Belt into a **GLOBAL SHOWCASE** for City Disaster Risk Reduction and Management and as an example Multi-Sector Development for the region.

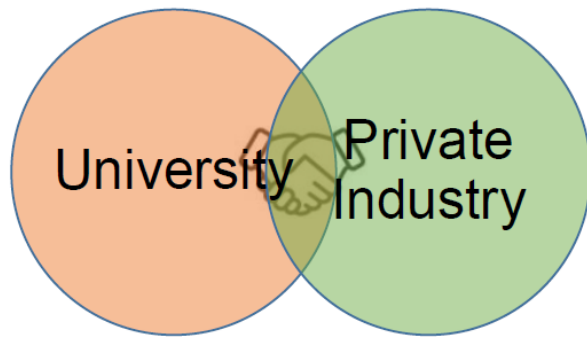
Commitment from the Mayors

Google Earth screenshots of Northern Philippines and the Cagayan Valley

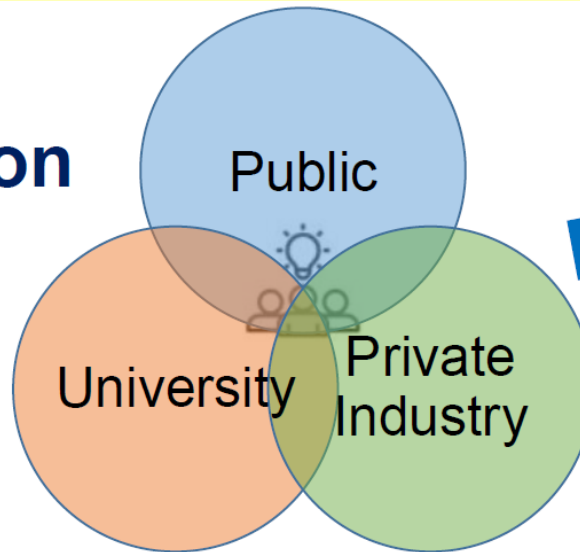
“Quadruple Helix” – Evolution of Open Innovation

Quadruple Helix is a concept of ecosystem to create open innovation, and was proposed in the discussions in “Open Innovation 2.0” of Horizon 2020 of EU.

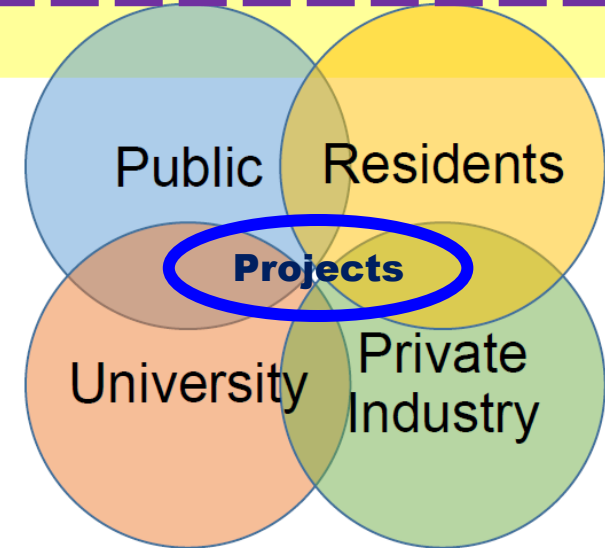
Evolution of Open Innovation



Double Helix:
Collaboration of
academia and industry

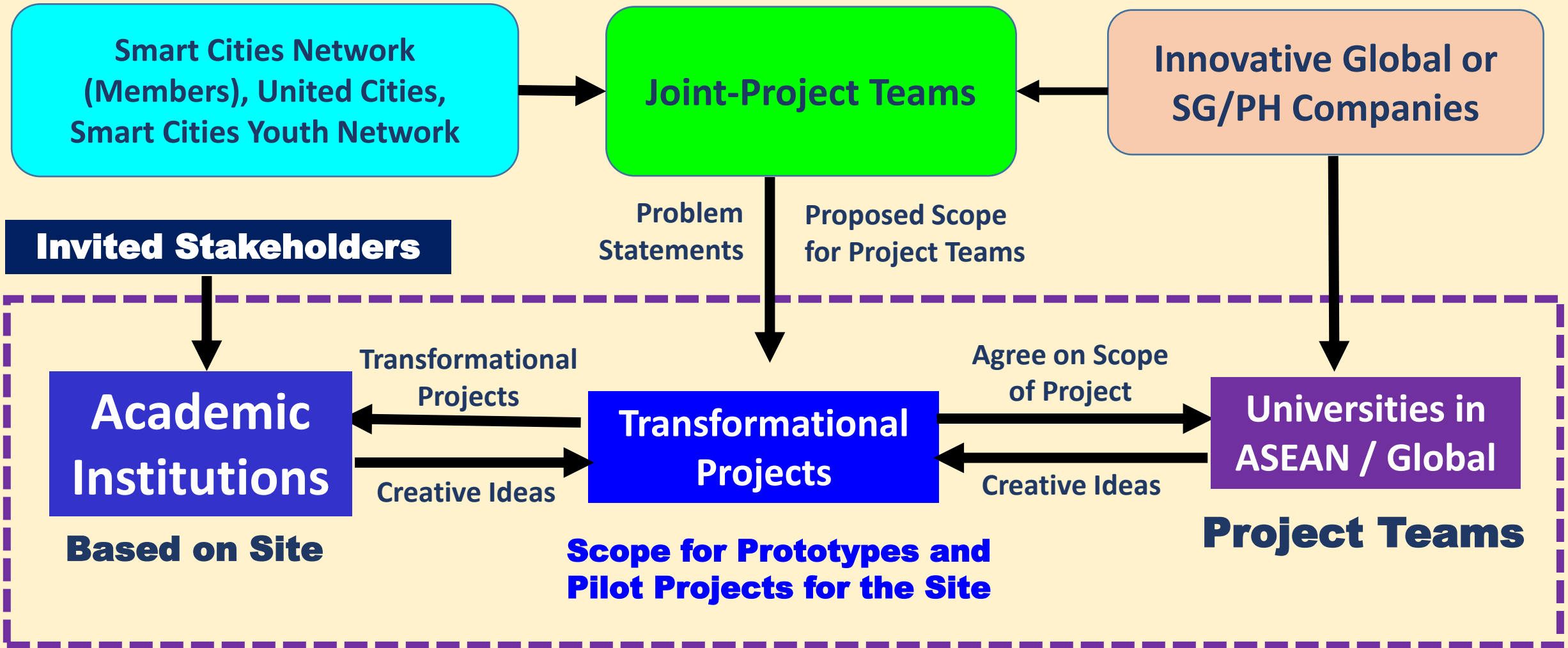


Triple Helix:
Institutional and financial
support by governments



Quadruple Helix:
Participation of citizens as
beneficiaries of innovation

Proposed Industry-Academia Collaboration between Academic Institutions (PH and SG) and Smart Cities Network (SCN)





GLOBAL AWARENESS THROUGH EDUCATION – UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (GATE-UN SDGS) 2021

September 29 - November 10, 2021
2:00PM - 4:00PM
Via ZOOM



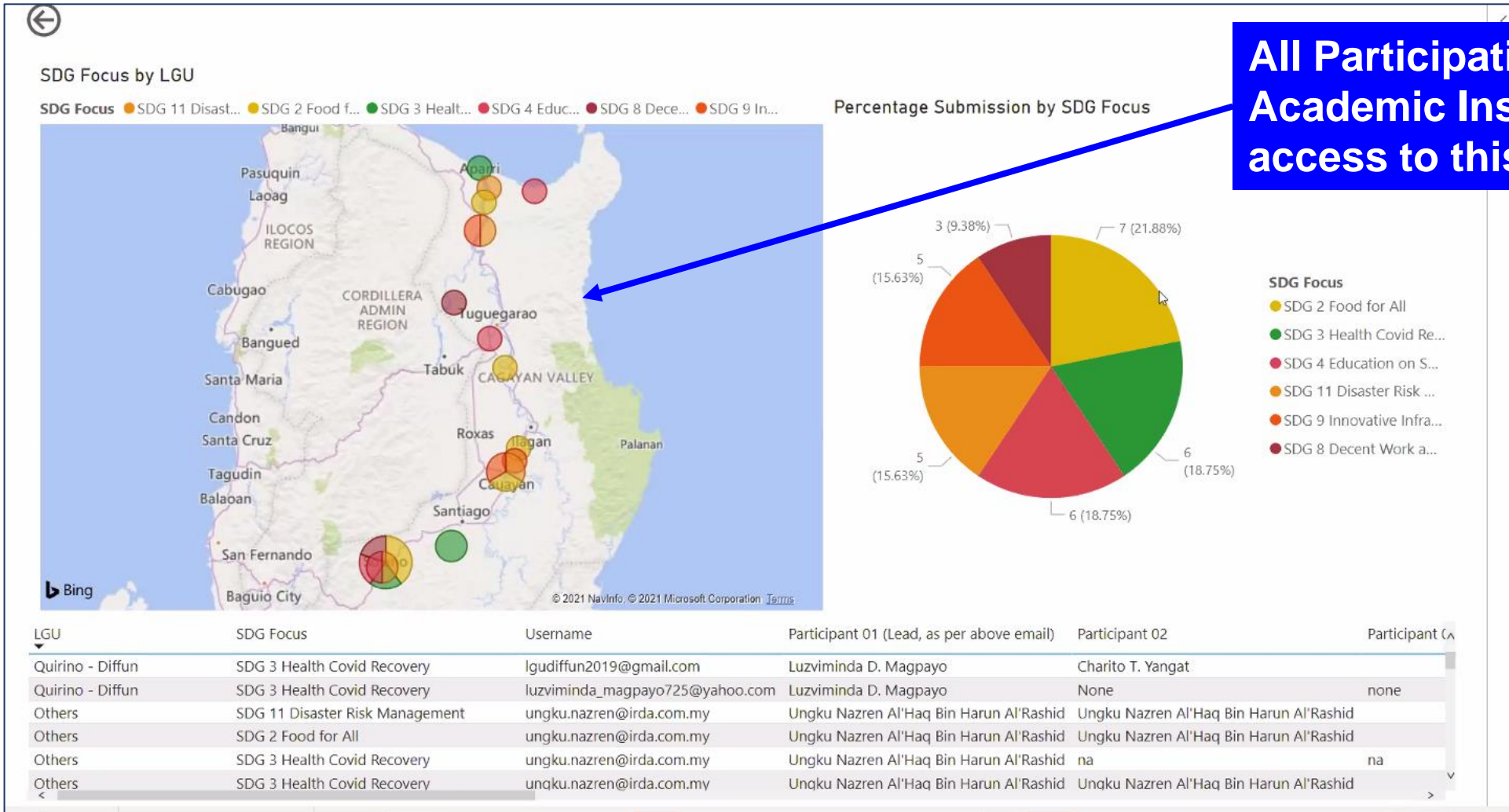
"Promoting collaborative partnership within the Cagayan Valley Smarter City Belt towards achieving sustainable development"

By Kok-Chin (KC) TAY
Chairman
Smart Cities Network

The ABC of Projects in ASEAN
29th September 2021



Pilot Projects aligned to UN SDGs – Outcome from GATE Workshop



All Participating LGUs and Academic Institutions will have access to this Regional Info

Collaboration with Phnom Penh as a Smart & Sustainable City

**Cambodia will be
Chair for ASEAN
in 2022**

**PHNOM PENH
2020 / 2035**

**SMART &
SUSTAINABLE
CITY
STRATEGIC
ROAD
MAP**



With the Financial Support
of The European Union

The GOAL for Phnom Penh

**A Model Capital City with future leaders for
Phnom Penh, Cambodia, ASEAN and the
French-speaking cities globally**



Topic 1: Land Use
Topic 2: Safety and Security
Topic 3: Urban Mobility
Topic 4: Environment
Topic 5: Data Management

- 1. Position Phnom Penh as a model Smart & Sustainable Capital City for a Developing Nation**
- 2. Develop Future Leaders for Phnom Penh, Cambodia, ASEAN, and the French-speaking cities globally**
 - Collaborate with the World Bank, Asian Development Bank, UN Agencies and other investors with Private Sector involvement - The Public-Industry-Academia-People Collaboration**

3.5 TOPIC 4: ENVIRONMENT & OBJECTIVES

Pilots in
Year 1

mation being easily accessible online, through all the waste cycle process. Working smoothly with coordinated Institutions & well framed and fair PPPs, with detailed regulations framework, to ensure long term success & everyone's benefit.

3.5.1 WASTE MANAGEMENT - OBJECTIVES

Pilot in
Year 1

IMPROVED COLLECTION

Developed (partly / fully) through PPPs, the City will ensure a well-organized waste collection, in all locations and for all waste types. Supported by digital tools and global monitoring, the citizen will be informed of specific waste and collection schedule to avoid letting them in the public space and ensure efficient services.

Specific tailored services will be used according waste type and location. Digital development maps, gps location, feedback forms, waste tracking ... will allow optimized service and synergy creation with circular economy actors.

CLEAR REGULATION AND DEFINITION OF ACTORS' ROLES

Providing each party involved with clear defined tasks and responsibilities (citizen included), infor-



COORDINATED STRATEGY ALONG PROCESS TO HARMONIZE

Proper support of digital tools for each one waste cycle step, to allow strong organization, smooth processing, and data inter-action through smart technology. To ensure effectiveness of these operations all related needed equipment, protocols, required skills, for collection segregation disposal recycling, legal PPP framework ... have to be ready to perform effective smart services.

ENSURE FAIR COMPETITIVENESS AND WASTE FRAMEWORK ENFORCEMENT,

While the City need to setup a mechanism that will create a win-win situation with private operators, it has to ensure that everyone's role and responsibilities are well handled, from the operator, the citizen, and any waste related actor. Therefore skilled dedicated teams aware about a detailed waste regulation and supported by smart tools (smart contracts, waste tracking, incident feedback ...) need to warranty the proper enforcement of the waste framework, supported by local legal onsite enforcement authorities.

Internal Pilot in Year 1

Internal
Pilot in
Year 1

Internal Pilot
in Year 1

Source: Phnom Penh 2020/2035 – Smart & Sustainable City Strategic Roadmap, Jan 2021

3.5 TOPIC 4: ENVIRONMENT & OBJECTIVES

3.5.3 DISASTER RISKS MANAGEMENT - OBJECTIVES

CLIMATE - DISASTER - EMERGENCIES: ALL LINKED

Every emergencies, early warning system included, have to be linked in real time through a more global smart safety system platform (fire, pollution, pandemic ...), in order to allow adequate fast response for any emergency type through the City.

SMART CITY EARLY WARNING SYSTEM EFFECTIVE & INCLUSIVE

The City would enable an accurate early warning system with inter-active recommendations & global information diffusion,



reaching everyone in the city (this implies multiple technologies used at a time, and even complemented by human action, to ensure that no one is left behind).

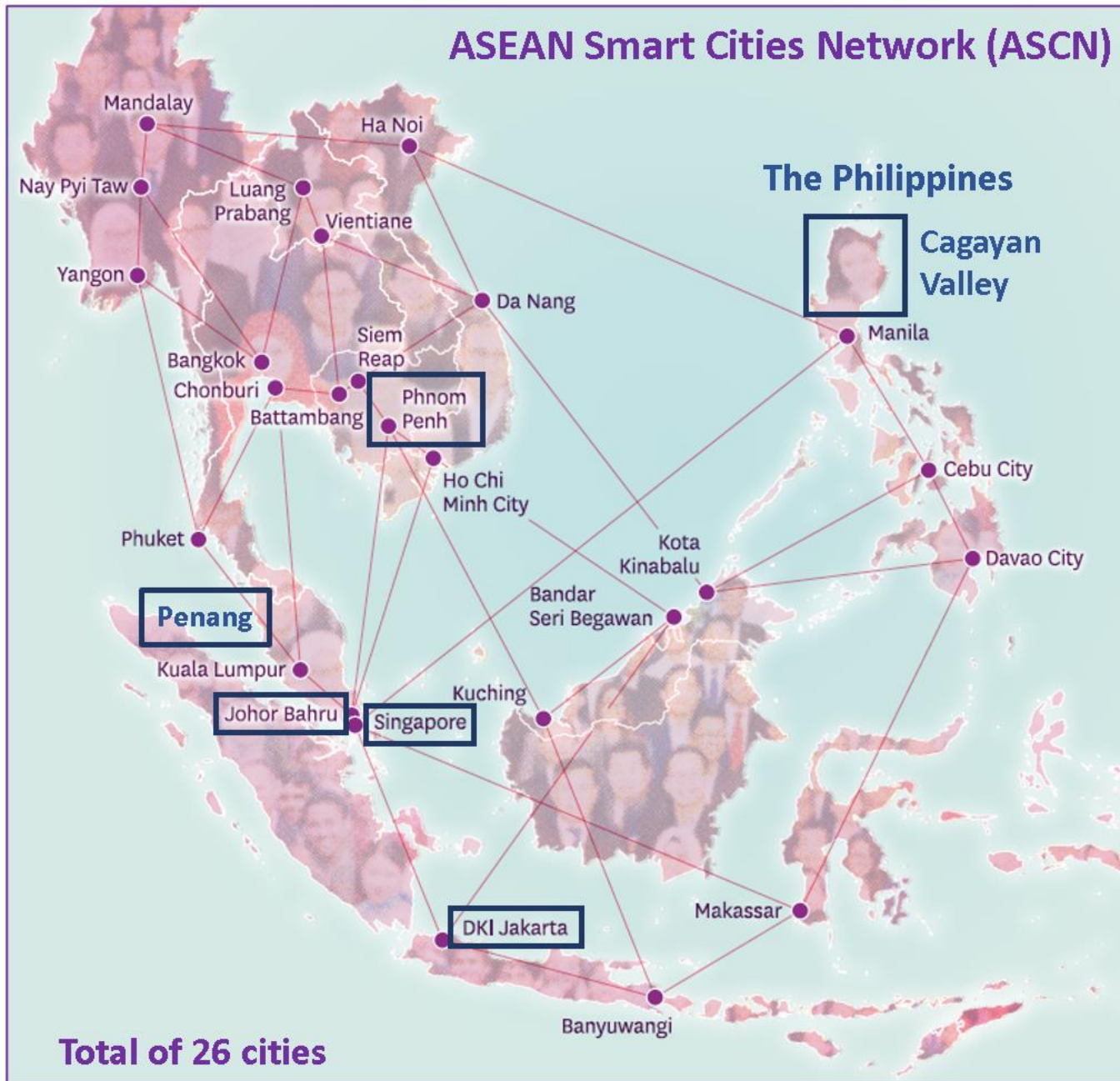
To ensure the adequate emergency response coordination system effectiveness, the elaboration through a relevant network of institutions & actors, of a standardization protocol of emergency levels and related processes will be build.

ONE MAJOR CLIMATE LOCAL RISK: FLOODS

With climate change delivering more and more storm like rainfall, the water reservoirs and buffers, paired with optimized drainage system, need to be adapted and anticipated with several smart monitoring and mapping

solutions, form water nature based one to underground smart reservoirs and mix-used new water ponds, real time water level Smart City map, to be able to manage with success, these phenomenon through the Capital.

ASEAN Smart Cities Network (ASCN)



<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

Proposed ASEAN Strategy and Implementation Plan for Disaster Risk Reduction and Management (related to Flooding)

Proposed Rollout in 2022



Kok-Chin Tay
Chairman
Smart Cities Network
Singapore

24th November 2021

Collaboration Concept: Digitally Twinned Smart Cities

Key Enablers

- Government Support & Site Visits
- Investment into cities
- Digitalization of City
- Partnerships

Focus Areas

- Dev of SMART Hubs for SDGs
- Smart Infrastructure (Built & Digital)
- Industry Development
 - Smart Education, Smart Tourism
 - Big Data, Artificial Intelligence
 - Food Security & Smart Retail
 - Circular Economy & Others



SMART Hub

Cambodia
Phnom Penh

SMART Hubs

Singapore
SDG Center

SMART Hubs

Philippines
- Cauayan City

SMART Hubs

Malaysia
Iskandar Penang

SMART Hubs

Indonesia
West Java

Batam

Jakarta & Bandung

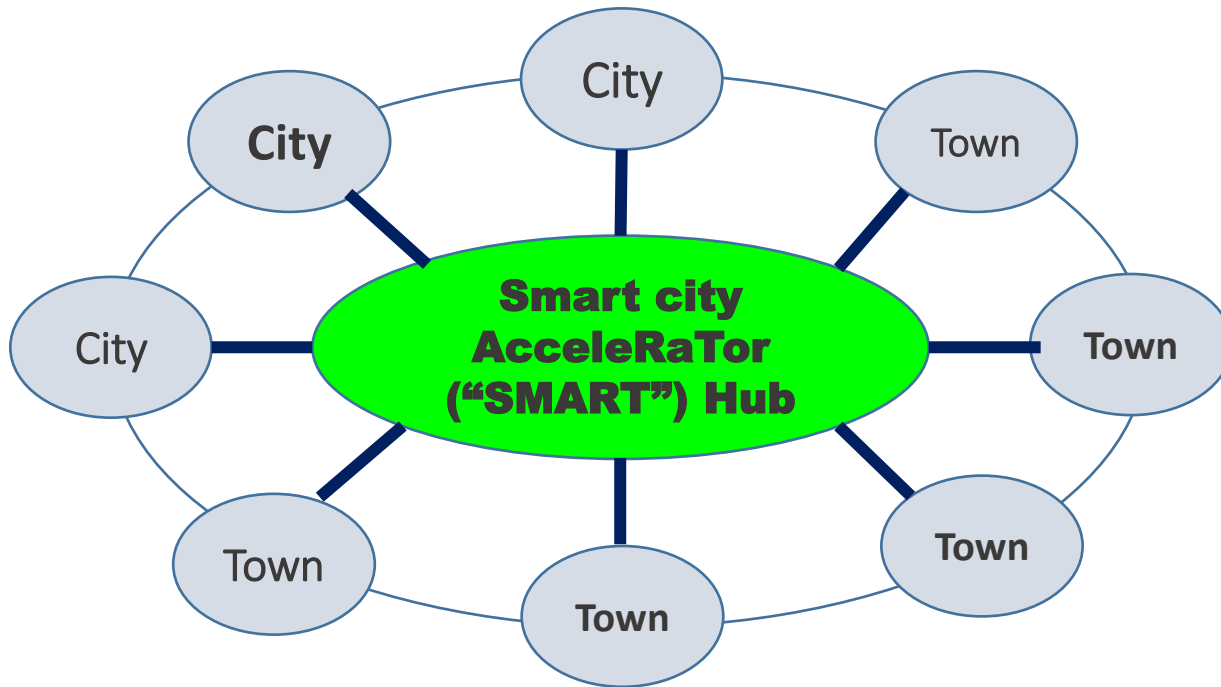
US, Europe

Hubs In Other Countries - US, ANZ, Europe & Africa

Hubs In India

Hubs In ASEAN

Leveraging the Quadruple Helix Collaboration to establish the “SMART” Hub for Smart Cities and Communities in ASEAN



1. *The SMART Hub will be a model for the development of UN SDG Hubs in ASEAN*

2. **Main Objectives of the SMART Hub**

- a) *Develop “Train-the-Trainers” Programs for Capacity Building*
- b) *Establish Systems to sustain the development of programs with key stakeholders*
- c) *Agree on the Process of Engagement within the city and with other cities*

To be launched in 2022 when Cambodia takes over as Chair for ASEAN

The SMART Hubs will be positioned as the Centers of Excellence for Smart Cities and Communities

11:30-12:45

BREAKOUT SESSION II: 4IR technologies for climate change mitigation and clean energy

This breakout session will deliberate on enabling policies and strategies to harness 4IR technologies to reduce Greenhouse gas (GHG) emissions and shift towards clean energy sources. The experts will share experiences, good practices, and case studies for climate change mitigation by harnessing 4IR technologies.

Harnessing 4IR technologies for sustainable and smart cities	Mr. Kok-Chin Tay Chairman of the Smart Cities Network, Director for Smart Cities Council ASEAN, Singapore
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Concluding Remarks

- 1. Political Leadership to lead the change**
- 2. Form Task forces with Measurable Outcomes**
- 3. Seek to collaborate with others and develop the Ecosystem**



Contact Person

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