

# The Paris Climate Agreement Together With the 2030 Sustainable Development Goals & Web 3.0

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By 2030, the new megacities, empowered by the Occident, will continue to take shape in Asia and Africa. According to the United Nation's forecast, there will be 41 megacities with populations over 10 million found in Asia and Africa. China (1.4 billion) and India (1.3 billion) will remain the two most populous countries in the world, comprising 19 and 18 percent of the global total. The total population in Southeast Asia has doubled in recent years with an estimated population of 593 million in the year 2010. By 2030, the UN predicts 60% of the world's population will live in urban areas and 95% of these urban shifts will take place in developing countries totalling 4.9 billion people. Over the last two centuries, population growth was the result of movement found in the developed world, as poverty decreases throughout Asia and Africa, birth rate increases, immigration continues, in combination with decreases in emigration and decreased death rates, population will continue to increase in Africa and Asia. As countries work to implement the Paris Climate Agreement and the Sustainable Development Agenda for 2030, growth in urban populations is critical to observe and balance for global life quality. Cities are viewed as centers for enhanced socioeconomic development and life quality. In developing countries, rapid shifts in population with increases in demand on the local supply, create a larger gap in the local GDP. Public policy makers in Asia and Africa have the opportunity to work together with multiple stakeholders for frameworks to support people, the environment, and governments with public services. Using this consideration, we observe the growth in population found in emerging megacities, trends in population shifts and increases in socioeconomic opportunity to be found in the use of information systems for governance and trade. We have identified this framework as the start of best practice for Web 3.0.

*Keywords:* mega cities, smart cities, Paris Agreement, climate accords, sustainable development goals, web 3.0

## Introduction to Web 3.0 in Smart Cities

According to Deloitte, Web 3.0 is often used interchangeably with the Spatial Web. Spatial Web references the shift in web behavior from screens on a mobile device or computer to the physical space around the person (Diamandis, 2018)<sup>1</sup>. When we think about the Spatial Web, we should consider best practice in infrastructure development already defined in smart cities.

The concept of a smart city has several key pillars defined by the Ministry of Urban Development in India as follows: Social, Physical, Institutional, and Economic Infrastructures. Within this proposed governance

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<sup>1</sup> The world around us is about to light up with layer upon layer of rich, fun, meaningful, engaging, and dynamic data, data you can see and interact with. This magical future ahead is called the Spatial Web and will transform every aspect of our lives, from retail and advertising, to work and education, to entertainment and social interaction.

framework are key principles, infrastructure should be measured and built upon for successful smart city development. These are noted to include: Quality of Life, Employment, Investment Opportunities, and Competitiveness. These principles establish the context and benchmark measurements to establish the smart city infrastructure. As new infrastructure is proposed and built, data are collected to observe the measurable impact such solutions have on the Quality of Life of populations in growing megacities. Particularly in the context of India, private-public partnerships are encouraged to maximize the use of land allocated to city competitiveness for foreign investment, increase jobs, minimize environmental impact, and provide government services to citizens (Esri.in, 2017).

### **Current State of Smart City Adoption**

According to the IMD-SUTD Smart City Index (SCI) published in 2021, the top smart cities in the world are ranked in order as the following: Zurich, Switzerland; Oslo, Norway; Taipei, Taiwan; Lausanne, Switzerland; Helsinki, Finland; Copenhagen, Denmark; Geneva, Switzerland; Auckland, New Zealand; and Bilbao, Spain. The results were produced after surveying 15,000 residents from each of the cities. There were five key areas measured: health and safety; mobility; activities; opportunities for work and school; and governance. Residents of the mentioned cities were asked how technology is working in their cities to improve their life in each of the key areas. From the survey, the researchers found that after COVID-19 more emphasis has been placed on health and climate related issues. In regards to the mobilization of COVID-19 resources, smart cities backed by a strong digital infrastructure and agile framework have the ability to track contact between citizens to distribute knowledge and supplies at a faster rate. Smart cities have the ability to rapidly shift based on the real-time needs of their citizens without much delay.

Smart city initiatives emerge with the support from international and local stakeholders and private-public partnerships. These initiatives take less time to develop and can often be built natively and locally between partners. National governments can develop frameworks for a streamlined approach between different smart cities. Smart cities are not measured on their size but rather their overall life quality and ability to employ technology effectively to support their citizens. Smart cities can also be megacities with larger population sizes. There is not yet a smart megacity found within the observed smart city index scores. Megacities present a larger challenge as there is more on the scale to balance; megacities are top producers of GDP for their countries.

### **Smart Cities in Developing Countries**

As cities in developing countries already face extreme challenges in poverty, safety, security, and mobility, the ability to have a cohesive smart city planning strategy can be more difficult (World Bank, 2021)<sup>2</sup>. Resources are spent elsewhere and the focus is on a short-term strategy for planning as opposed to a long-term 2030 or 2060 Agenda found in the Paris Agreement. As developing countries also reset after COVID-19, we should reconsider how emerging technologies should be seen not as out of reach or highly expensive rather as essential services to

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<sup>2</sup> One of the toughest issues facing many cities, especially in developing countries, is the lack of evidence-driven planning and decision making, which is necessary to realize livable urban environments. “Smart cities—with their ability to harness technology to improve planning and the efficiency of service delivery, and their governance and effective urban management—are key to achieving a green, resilient, and sustainable future for all,” according to Sameh Wahba, Global Director for the World Bank Urban, Disaster Risk Management, Resilience and Land Global Practice (GPURL).

help with faster and cheaper deployment for use by citizens while enhancing their overall life quality. Data for urban management frameworks are found to be best practice as a starting point to center emerging technologies in a megacity toward the same shared goal for good governance and enhanced life quality. These data unite stakeholders and partnerships around common goals.

The smart city agenda makes use of private and public partnerships to develop a comprehensive framework for stakeholders and the government to better inform public services for their citizens. There are different indices used to identify the nature of a smart city. We observed the IMD-SUTD Smart City Index (SCI) and also the Safe Cities Index 2021 by the Economist sponsored by NEC. Using the provided Index scores with each of the smart city pillars, weights are developed to understand the global high and low performers in the smart city space where data are available within the mentioned groups of: health and safety; mobility; activities; opportunities for work and school; and governance.

In the case of Indonesia, the City Planning Lab (CPL) worked closely with private and public partners to build a Municipal Spatial Data Framework (Singh, World Bank, 2022)<sup>3</sup>. In such frameworks, multiple streams of management converge into one and collaborate together as opposed to being siloed or competing. These include Institutional Arrangements, People, Data and Systems. Also, such systems can not only be open to the city without the ability to communicate beyond. Within the CPL in Indonesia, the team developed the ability to share knowledge between the World Bank, International Agencies, Communities, Government, Think Tanks & Academia, and the Private Sector (9th Asia Smart City Conference, 2021).

## Municipal Spatial Data Infrastructure: an ecosystem approach.

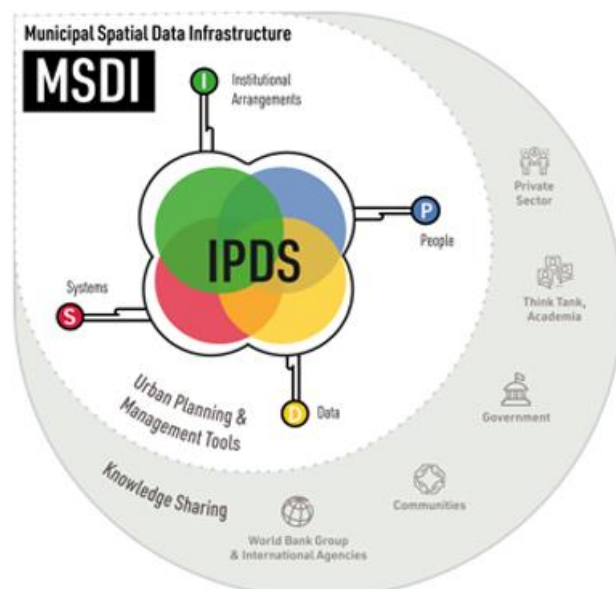


Figure 1. City Planning Lab data concept map (World Bank, 2022).

Note. City Planning Lab's municipal spatial data infrastructure concept map (from the presentation shared at the 9th Asia Smart City Conference).

<sup>3</sup> What has been achieved together with the cities has gone beyond our initial expectations, said Singh, adding that such success was only achieved by fostering collaborations across city agencies. "It is not time to compete, it is time to collaborate," she stressed, calling to donor agencies, universities, the private sector, and governments to work together and deepen data-driven management of cities (Gayatri Singh, the World Bank Senior Urban Specialist leading CPL in Indonesia).

## Health, Safety, and Governance With SDG 16: Smart City Case Study Ghana

The case study, “Smart Cities for SDG 16: Peace, Justice & Strong Institutions”, was conducted in the cities of Accra and Kumasi, Ghana with a sample size of 1,120 residents. The survey set out to measure the community sentiment around the development of smart cities. There are many architectural and business plans developed across the South, Southeastern Asia, and African continents. The question the collectors of data set out to quantify and answer was, “Why do these projects often do not get off the ground or even fail?” When developing the framework of survey questions for participants in the study, the teams wanted to keep in mind the measurements of smart cities. Previous non-profit work and data collection activities have focused on the sub-region of West Africa for the countering of violent extremism (CVE) (Voices for Peace (V4P), 2021)<sup>4</sup>. The impact can be noted as the following:

- V4P partner radio stations reach over 3 million listeners, largely in rural and hard-to-reach communities.
- V4P has produced over 15,000 hours of original broadcasts to engage communities in local CVE-relevant issues.
- An impact evaluation of V4P’s radio soap opera content in Burkina Faso demonstrated that among listeners, the productions (i) reduced attitudes on the justification for violence by 4%, (ii) increased willingness to collaborate with security forces by 18%, and (iii) increased awareness of governance issues by 5% and insecurity 2.5%.

The current case study<sup>5</sup>, although not present in the areas receiving USAID in the V4P project, made use of independent research in Accra and Kumasi, Ghana. Ghana is also in the sub-region of West Africa. For the purpose of the research, our team wanted to explore the current narrative in the sub-region to observe from the lens of quality of life and socioeconomic opportunity to understand the interest for smart city and emerging technologies in the region. Considering previous data collection work, we focused our study on the smart city through the mental health and safety lens, using SDG 16 metrics as our indicators. The indicators measured used a series of survey questions to understand the perception of the community through digital collection methods and reported as the following:

- SDG 16.6.1: Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar);
- SDG 16.6.2: Proportion of population satisfied with their last experience of public services;
- SDG 16.10.2: Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information;
- SDG 16.7.2: Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability, and population group (focus on age);
- SDG 16.1.4 & 16.7.1: Proportion of population that feel safe walking alone around the area they live after dark & Proportions of positions in national and local institutions, including (a) the legislatures; (b) the public service; and (c) the judiciary, compared to national distributions, by sex, age, persons with disabilities, and population groups (focus on age).

For the purposes of the sample size, we will define risk from the Wikipedia definition as “effect of uncertainty on objectives”. Within the sample group, on a scale from 1-5, the following statistics were observed:

- SDG 16.6.1: 1.8, average perceived government transparency;

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<sup>4</sup> The Voices for Peace (V4P) initiative was established by USAID from the periods of September 2016-December 2021 in the regions of Burkina Faso, Chad, Niger, Northern Cameroon, and Eastern Mali. This initiative has contributed significantly to the Sustainable Development Goal 16, “Peace, Justice and Strong Institutions”.

<sup>5</sup> The presented case study was developed by non-profit organization, the Voices for Peace, established in Ghana in collaboration with IoTeedom, a private corporation with offices in the United States, Ghana, and sub-chapter in India.

- SDG 16.6.2: 1.8, average satisfaction with public services;
- SDG 16.10.2: 2.1, average ability to access public information;
- SDG 16.7.2: 2.2, average inclusion of youth in decision-making;
- SDG 16.1.4 & 16.7.1: 3.2, average perceived sense of community safety & pride.

Based on the research, our team was able to find links between private and public partnerships in the areas of good governance with the overall risk perception in the population. Subsequent studies will be used to complement the research to ensure adequate replication for scientific analysis and error margins. Future work will seek to draw correlation to good governance frameworks and the acceleration of smart, mega cities. The research will use the existing data set and new data sets to train the algorithms to detect data outliers within the domains of health, safety, and security to optimize for the acceleration of positive perspectives in the community to support investments into Web 3.0 systems from the public and private domains.

### **Positive Correlations to NDC Planning With SDG 16 and GHGs**

Other research conducted by the Institute for Economics and Peace shows a strong link between collective well-being and good governance in the community and as a result higher GDP, increased resilience and better performance on the SDGs (Positive Peace Index, 2022). The case study conducted in Ghana and the Positive Peace Index developed are examples of data tools referenced to provide vision into a common framework for connecting the SDGs to the Paris Climate Agreement. We will assume that in order to manage against the effects of Climate Change in developing countries and also developed parts of the world, one should develop a framework centered around peace. Such frameworks should identify indicators and a system of measurement to track over time how improvements in peace either increase or decrease. These changes can then be correlated to other SDG measurements and work to reduce Greenhouse Gas (GHGs) to set Nationally Determined Contributions (NDCs) working closely by region and with the submission of reports to the national levels to meet the objectives set by nation for the Paris Climate Agreement.

In conversation with National Statistics Offices across several countries, the observations have shown limits in certain data sets. Particularly, data when collected by a handful of organizations can miss parts of the city dynamic with gaps in data in reference to SDG 16. There can also be underreporting of data without the right balance of organizations and management to balance the data collection at both the regional and national levels. Smart city initiatives are helpful in that they create a shared network of common values around the same vision between regional partners for collaboration within the smart city framework.

To help mitigate against the gaps in data, the proposition of using a smart city framework to connect together SDG 16 with the Paris Climate Agreement should be an initial step in the development of a smart city data management strategy. When all partners have the ability to connect their initiatives around the same purpose and the ability to share data in an open framework, private and public organizations are able to increase innovation, creativity, and peace in their environments.

For example, in Ghana, the project is called the “One Million Trees Project”. Trees are planted to help reduce the amount of GHG emissions. With the understanding that what is done in one country can work to offset what is done in another, is critical in understanding how the SDGs can work hand in hand with the Paris Climate Agreement. As we live, work, and travel in different parts of the world, as with any balancing of an equation, the perspective should be to balance these emissions in megacities where GHG emissions are the highest. “One Million Trees Project,” has increased the Foreign Direct Investment (FDI) into Ghana all the while working to enhance positive

peace, social impact and reduce the overall contribution of GHGs. The chart below shows the countries at the time of observation in 2020 with the highest percentage of GHGs. Similar programs can be adapted internationally between partners to monitor and adapt planned NDCs and FDI strategy (SME Grow Africa, 2022).

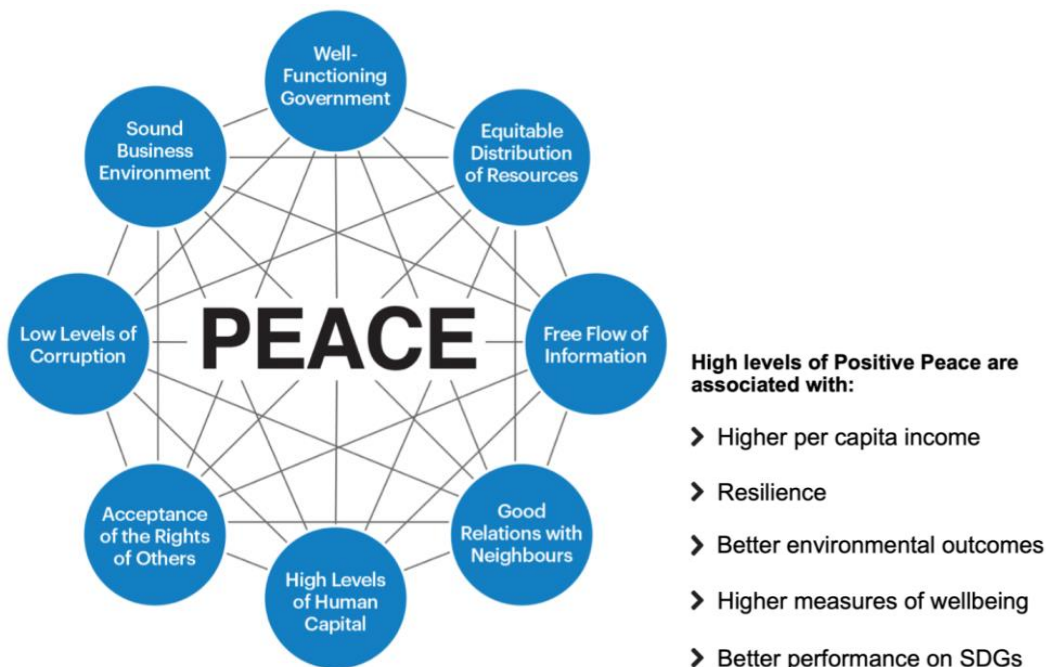


Figure 2. Positive peace index (Dlewis, 2022).

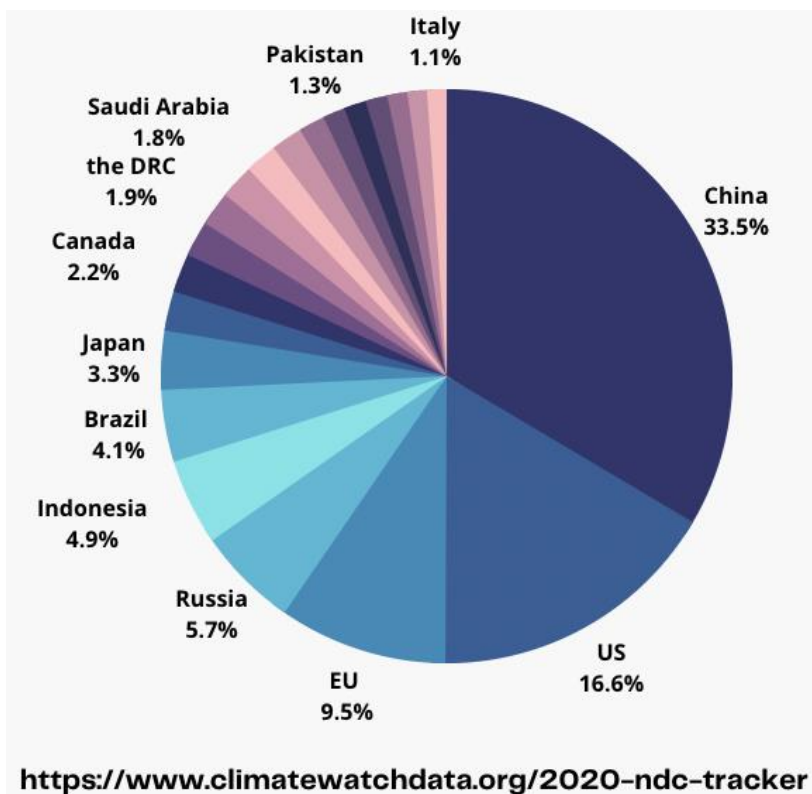


Figure 3. Climate target update tracker (Climate Watch Data, 2022).

### **Democratizing IoT With Small Business Support**

Frameworks can be developed in both developing and developed countries with small and medium-sized enterprises (SMEs). SMEs can partner together with the public sector to develop smart city frameworks. Each partner within the network could appoint a board to oversee the project. Reporting would be developed at a cadence on a monthly, quarterly, and yearly basis. To further scale similar programs, other CSR programs and each organizations' social impact on the use of IoT can help to expand infrastructures. IoT or the Internet of Things with the use of sensor technology can work to report on air quality, detect flooding, and report violence and theft in communities. An IoT framework can be paired with a citizen generated data platform to increase socioeconomic development. The private and public sectors deploying such a framework could agree on common goals to align their benchmarks. Stakeholders would start from the basic units of well-being, good governance, and sustainable production to ensure all operations within the smart city framework ladder up to the corresponding SDGs (3,8,11,16) to start with helping to plan and measure NDCs by each country partner, establishing peace at the core.

### **Connecting the Dots: Smart Cities, Web 3.0 & IoT**

When more businesses and governments invest into smart city data frameworks at the local, national, and international levels, the opportunity for filling in the missing data gaps for the SDGs increases. These data gaps help to connect the dots. The development of an infrastructure with use of IoT helps enhance the quality of the establishment of an interactive Web 3.0 environment for informing decisions and policy-making in each community. Cities have the ability to move further on the scale to become smart cities. Smart cities can move further in their advancement to develop FDI frameworks with partner countries to invest in megacities. The development of data frameworks reduces travel barriers and time it takes to get into the city center. With Web 3.0 or the spatial web, stakeholders and citizens can partner together in different countries. One city in a developed country with high GHG can partner with a country high on negative peace to help balance the SDGs and the impacts of climate change. Spatial web or Web 3.0 with use of IoT provides us with new perspective to explore terrains, reduce barriers, and form more collaborative, international environments to advance the international law and order needed to connect the SDGs and the Paris Climate Agreement. This ensures we meet our mission to develop more smart cities throughout the world, particularly converting more mega cities into smart cities by the year 2030. Democratizing such infrastructure and services provides the opportunity for partners in both developed and developing countries to participate to further realize SDG 17: Partnerships for the Goals. Figure 4 highlights the willingness of citizens to provide data to their insurers to increase their cost savings, community resilience, and positive peace (Insurmatix, 2022).

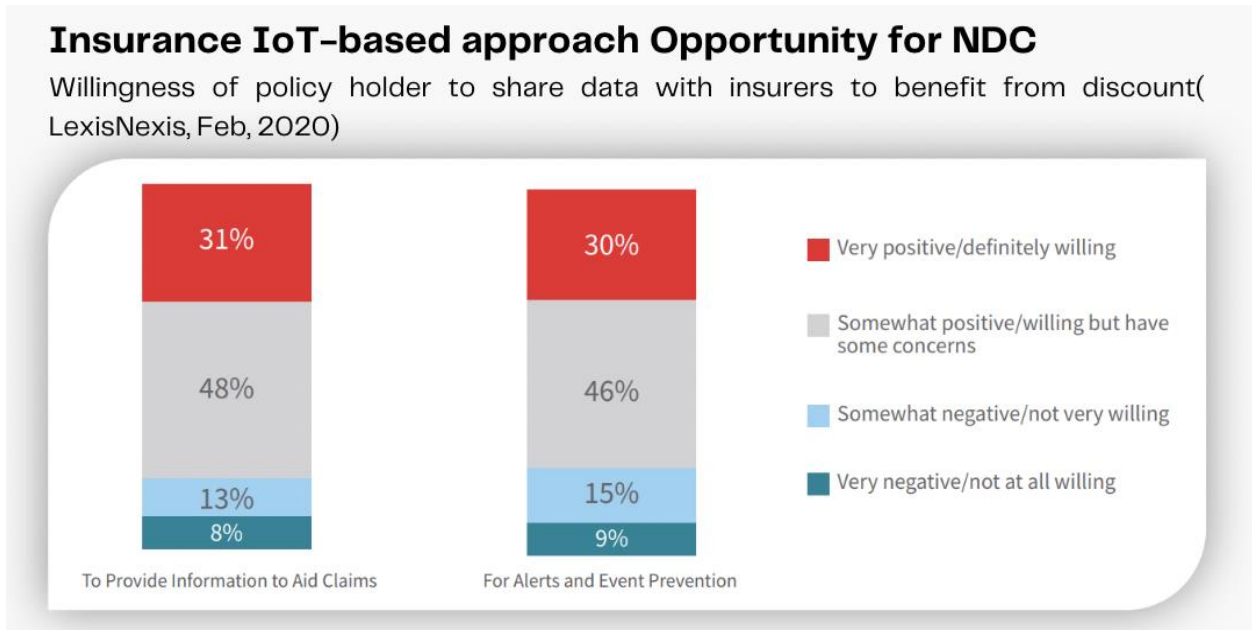


Figure 4. Insurmatix presentation for the Global Climate & SDG Synergy Conference Tokyo, Japan, 2022 (LexisNexis, 2020).

### Visual Data Application Layers

With Web 3.0 and IoT technology, we have the ability to create visual data application layers. The chart below highlights the different functionality identified on each of the data layers within the network: the ability to collect and integrate different information sets, understanding behavior in particular contexts, and providing origin-based solutions in a decentralized manner between stakeholders and organizations within the network (Safe-esteem, 2022). These layers are powered by data centered around the common mission and vision established by the stakeholders at the start of the project. Imagine the ability to work fully remote in a developed country to visualize in the spatial plane the framework your team also collaborates on in a country in Africa or Asia. With visual data application layers, the ability to create such educational and work environments can be actualized. Visual data application layers can be present on low code platforms without the need of large server networks and electricity consumption. Using lightweight, sustainable materials, new data layers can be visualized within office spaces and the smart home. IoT devices can work in union with visual data application layers to provide real-time risk monitoring and detection in both the building and in the surrounding environment. The data provided can also help create incentives for stakeholders and citizens offering cost-savings on insurance alongside other financial products. Local and international teams have the ability to receive alerts to understand any data outliers provided from the citizen generated data and the IoT devices to mitigate situations faster and more efficiently for enhanced resiliency planning.



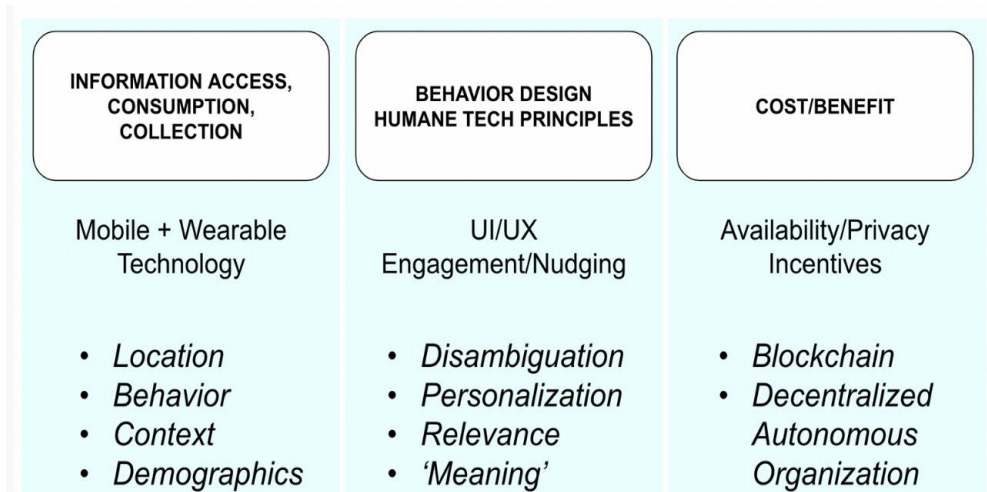


Figure 5. Safe-esteem presentation for the Global Climate & SDG Synergy Conference Tokyo, Japan, 2022 (Safe-esteem, 2022).

### Revising GDP as an Indicator

The Spatial Web provides the ability to work across borders, redefines what a smart city is and helps to provide infrastructure and tools in converting megacities into smart cities. To further work hand in hand with the Paris Climate Agreement and the SDGs, we should not only develop these data frameworks, we should also track regional and national GDP around the same benchmarks. As we allocate private and public investments and the tracking of CPI, we should also consider the positive and negative increase per capita in SDG and NDC goals. Bridging GDP closer to the Paris Climate Agreement and the SDGs, creates further incentives for countries to make use of Spatial Web/Web 3.0 technologies to promote positive improvements in well-being, good governance, and sustainable production to expand GDP. Each of the collected data sets can work to improve the city development as well as create functions to expand future GDP with the support of Web 3.0 frameworks.



Figure 6. IoTeedom presentation for the Global Climate & SDG Synergy Conference Tokyo, Japan, 2022 (IoTeedom, 2022).

## Future Implications and Recommendations

Considering current and future mega cities, overpopulation left unmitigated, continues the negative effects of overcrowding and declined health, safety and security within urban centers. These challenges are not specific to one border or country. In the last few years, the remote nature of work and life balance has evolved. With the increasing threat climate change poses on our society, we should understand emissions in one country and the decay of peace affects the global population, reducing the overall life quality and well-being of the entire population over time. The spread of information is faster. The impact felt in one region can now be experienced in different regions from a psychosocial perspective and eventually the reduction of overall health and safety in surrounding communities. We observe these effects found in the interconnection between social network applications. The social networks bring us closer together, however can also bring us further apart with the spread of misinformation.

Cities are constantly evolving from the first Industrial Revolution to the present one. One of the core dynamics measured was the time it takes for the population to arrive to the city center from a surrounding point. The ability for the population to travel into the city center quickly, while also having resources available to the citizens. We observe the previous Industrial model in terms of manufacturing and transport and should consider how we can make mega cities smart with the use of Web 3.0 frameworks, keeping peace at the core hand in hand with the Paris Agreement and the Sustainable Development Goals 2030 Agenda. Redefining international partnerships and FDI in the private-public sectors, is a starting point. We can further consider borderless work environments in future megacities around these common, shared goals.

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