Written evidence from Dr Tia Kansara

Introduction to Dr Tia Kansara

Tia is a multi award-winning entrepreneur. The youngest to ever receive the Royal Institute British Architects honorary fellowship, she is the co-founder of Kansara Hackney Ltd, the first ISO-certified sustainable lifestyle consultancy, and CEO of Replenish Earth Ltd, a cause and a collective action to protect the global commons.

Hailed amongst the Top 100 most influential leaders in Tech by the Financial Times and Inclusive Boards, her clients include Coca Cola, Bloomberg, the European Commission, Forbes, Formula One, MIT, and Siemens.

Aside from being the UCL Bartlett's Ambassador to the Gulf region and advisor to the Economic Times of India, she's an economist and future cities thought leader. In 2010, she wrote the brief and appointed the architects Foster+Partners for the Saudi American Bank's multi-million dollar headquarters as the first female to judge a LEED platinum building in Riyadh.

Tia did her Ph.D. at University College London, Energy Institute on designing future cities and energy evaluation, she has extensive experience in the Arabian Gulf. During her PhD, she worked alongside MIT and the Urban Planning Council, the Executive Affairs Authority, Department of Municipal Affairs, Abu Dhabi Water and Electricity Authority, Regulation and Supervision Bureau to create the first energy baseline and comprehensive energy evaluation in the Gulf.

In 2000 she was invited to present the International Baccalaureate (IB) to Lord Adonis, Educational Policy Adviser at the UK Prime Minister's Policy Unit, Cabinet Office. Trained at SOAS in Economics and South Asian Studies, whilst working with Bloomberg, she was employed by the Japanese Ministry of Education to modernise the teaching of the English syllabus for High Schools in Japan. While in Japan, she translated the Sanskrit works of Lord Swaminarayan's "Shikshapatri" into Japanese.

Her publications in peer-reviewed journals range from sustainable cities to human performance health and well being, presenting her findings at conferences internationally through social media. She has been invited to advise on sustainable cities for the government and private sector as well as at conferences around the world. In 2012, Tia was invited to present her views to President Hollande and Ban Ki Moon on the UN initiative: Sustainable Energy for All and has since worked closely with the Abu Dhabi government to deliver manageable energy reductions in the built environment, presenting her findings at the World Future Energy Summit, Abu Dhabi.

As a professional moderator, lecturer and author; she has interviewed world figures and experts, moderating for Forbes, Coca Cola, European Business Angels Network and London Business School, and delivered keynote speeches on the future of cities. She has lectured at New Delhi School of Planning; Musashi Institute of Technology; KEA University; McGill University; University of British Columbia; School of Architecture and Planning; and School of Architecture, to name a few. An executive committee member of London Business School's Global Energy Summit, and also Co-director of the international CleanTechChallenge. In association with the Club of Rome and the United Nations General Assembly she has advised the Royal family of Bhutan and Past Prime Minister Jigme Thinley and Prime Minister Tshering Tobgay on the creation of an international commission on sustainable, economic growth.

More generally on Dr Tia Kansara

- Replenish Earth
- Blockchain for transforming Cities

- How smart can cities be?
- ResearchGate
- Pandemic-Proofing Cities
- Reuters - Cities of the Future
- Balanced Cities
- RCA - Building Resilience
- TEDx - Future City as Experiment
- Wasteful Habits
- Transitional Spaces - Energy reduction
- The Evolving City
- CEPT - Comfort in Buildings
- Home for wellness - IIT
- LBS - Energy Summit
- Earth 2.0
- Global Presence, worked in 90 countries and their governments, and with over 120 companies, invited speaker at Google
- Depth of knowledge, a thought-leader on the subject, invited collaborator with the Indian Institute of Technology
- A passionate and engaging speaker on the subject, together with the PM of Bhutan
- Track record since the age of 6
- Global Awards of Achievement
- PhD on the topic
- A short summary of Replenish Earth
- https://medium.com/replenish-earth
- https://www.instagram.com/replenish.earth/
- On Community
- Moonshots for Europe

Introduction to Kansara Hackney Ltd

A leading firm of international consultants, delivering solutions to future urban needs. We, Dr Rod Hackney, PPRIBA, PPUIA, community architect and Tia Kansara, economist and business woman have combined our professions to deliver schemes that are affordable, well-designed as well as value for money and effort. Clients have summed up our consultancy in three key words:

- Can-do
- Ebullient
- Creative

Our international exposure reflects fifty years of experience gathering local knowledge in a number of countries which KH has worked in. These include Australia, Central Africa, China, Europe, India, Japan, Magreb, the Middle East, North and South America.

Introduction to Replenish Earth Ltd

Replenish Earth, is a climate resilience and adaptation consultancy that supports governments and businesses on their strategy, climate risk & investment.

Topic 1

Green Infrastructure

How well is green infrastructure being incorporated into building design and developments to achieve climate resilience and other benefits?

UNFCCC Resilience Frontiers
8. Developing transformative financial instruments
Pathway 8 is advocating for the development of transformative financial instruments that factor in the need to nurture environmental and human wellbeing. Using emerging technologies, including those within the fintech space, tracking finance, and accelerating sustainable practices, can be done through **mechanisms that facilitate the transition to an inclusive, low-carbon world**. One where the investment culture is characterised by its desire to deploy capital to fund ventures and individuals that are striving to deliver a climate-resilient and just world. And where the wider financial system offers fair access to support both citizens and businesses working hard to mitigate climate-related risks and instability. So that we come to replace the outdated models of finance that have prevented key workers like smallholder farmers - responsible for producing more than a third of our global food supply, from gaining easy access to small loans to grow their crops.

- Carbon footprint of construction sector

Ref: The **building sector emitted more than a third of global energy-related carbon dioxide** (CO2) — a record 10 gigatonnes (Gt) — in 2019, the United Nations Environment Programme said December 16, 2020. Building operations accounted for 28 per cent global emissions while construction-related industries (cement, glass, etc) added another 10 per cent, according to the 2020 Global Status Report for Building and Construction.

The CO2 emissions increased due to a **high proportion of fossil fuels used for power generation**, combined with higher activity levels in regions where electricity remains carbon-intensive, the report said. The report also noted that the sector's **decarbonisation progress was slowing down**. To get on track to net-zero carbon building stock by 2050, the building sector emissions should fall by around six per cent per year until 2030.

- Material debris amounts to resource wastage

Ref: "Department for Environment, Food & Rural Affairs (DEFRA) reports in their February 2018 edition of UK Statistics on Waste that in 2014 the UK generated 202.8 million tonnes of waste. Construction, demolition and excavation (CDE) was responsible for 59% of that number. However, the recovery rate for non-hazardous construction and demolition rate in 2014 was 89.9%, placing us ahead of the EU target of 70% by 2020. So, while the construction industry is still amongst the largest contributors for waste, we've come a long way with our recycle and reuse habits. We've also made a small improvement in the area of hazardous waste. In 2010, CDE was responsible for 4.8 million tonnes of the UK's hazardous waste. In 2014, that number had gone down to 4.3 million tonnes."

- Carbon is the currency for sustainable design: How do we ideally measure?

Ref: The currency of sustainable design is carbon, yet we still treat it as an abstract concept based on estimates of how much carbon dioxide is produced throughout a material's life cycle. Although conceptual carbon accounting is an important process for measuring environmental effects, we forget that carbon is also literally stored within certain substances. While many building materials including steel, concrete, and plastics contribute measurable quantities of carbon dioxide to the atmosphere—resulting in poor environmental performance—biomass, such as wood or other plant materials, acts as a **carbon sequester**, storing more carbon than it releases. Unless the material decays or is destroyed, the carbon will remain embedded within. Buildings with a significant amount of biomass-based materials (sustainably harvested, of course) may therefore be viewed as carbon banks.

Topic 2

Building materials

What role can nature-based materials play in achieving the Government's net zero ambition?

In the book Sustainable Materials, Dr Julian Allwood suggests reducing UK's CO2 output by disassembling steel frames and reusing them at high quality, rather than cutting them down and recycling the steel, which is the current practice. Allwood explains, "there are no fundamental technical barriers to designing steel buildings now, with 40-year old steel". Cost is the determining factor. The key to reducing costs is to produce standardised parts (steel frames in this example), and by designing them with mechanised joints, such as nuts and bolts. Allwood speculates that despite the higher cost of deconstruction compared to demolition (and the attendant health and safety concerns), there is a higher profit in reuse over recycling steel frames. Of course, there also needs to be a market for the reusable steel frames. With world demand increasing for steel-framed buildings, and likely to continue as the population grows, the market theoretically exists.

Ref: It's important to become educated on which materials are most detrimental to the environment. For example, designer Emily Peckenham explains that the production of concrete is a major contributor to greenhouse gases. That's why, Peckingham suggests, architects and construction professionals should look toward more sustainable alternatives such as **HempCrete**, sustainable, light-weight materials that can drastically reduce the energy used to create and transport concrete blocks. HempCrete is created from the woody fibers of a hemp plant, and they are extremely strong and durable, making the material a viable option for building.

Bamboo is another material that's both energy-efficient and sustainable to harvest.

...**Bioplastic** made from shrimp shells helped scientists at Harvard create a biocompatible, biodegradable, inexpensive alternative to ordinary plastic. This new bioplastic can easily be molded into 3D shapes, giving it a wide range of uses across personal and commercial applications.

Material futures: One example of a future innovation is smart bricks. For multi-use urban areas, writer Lara O'Keefe explains that **smart brick technology** will keep spaces clean and energy-efficient through the extraction of sunlight, water and air. These bricks will be able to process organic waste and respond to their surroundings, cleaning water and generating electricity on demand.

Topic 3

Lifespan of buildings

Ellan Macarthur Foundation published a study 'Engineering the Circular Economy' discussing the 'Art of Design for Disassembly'. Looking at the Modular Construction technologies, they stated "Some 20 million tonnes of construction waste was sent to landfill in 2010. Of all industries in the UK, the construction industry is the major consumer of resources, accounting for **90 percent of all non-fuel mineral use**. Demolition sites contribute a great deal of that waste, yet it need not be this way. If we deconstruct buildings rather than demolish them, material could be diverted from landfill and put to better use. This approach may aid employment, as deconstruction requires more time and manpower than demolition. However, most buildings are put together without consideration of how the materials could be used in their next life, making the deconstruction job all the more difficult. The situation could be significantly improved if architects were to design buildings with future use in mind. "

Designing like buildings last forever - Attitude change needed

Ref: One of the most significant impediments to environmentally responsible construction is the notion that all buildings are permanent. "Most designers do not design with an end in mind,". Despite incremental gains delivered by LEED and other environmental building programs, 160 million tons of waste related to building construction and demolition are disposed annually in the U.S.—about a third of the overall solid-waste stream. **Design for Disassembly (DfD)**, a method that demonstrates an awareness of eventual deconstruction and employs measures to facilitate the process, is seen as a pivotal tool for reducing construction and demolition waste. The approach champions principles such as the use of standardized components and reconfigurable connections. However, there are currently few incentives, other than environmental altruism, for architecture firms to adopt such a practice. As a result, designers are considered to be the primary impediment in DfD planning.

An alternative approach is to include **reverse construction considerations** in the design process. In this method, every stage of material design and specification beginning with initial product surveys should include DfD valuations, and design teams should associate quantifiable metrics that factor into material selections. **Construction documents should be viewed as having multiple lives and functions, informing not only how materials come together, but also how they can come apart.** New tools are on the horizon that can ease the way for DfD tracking. One example is the Building Information Modelling-based Deconstructability Assessment Score, proposed by University of the West of England, Bristol research fellow Olugbenga Akinade and his colleagues, that will enable designers **to measure the DfD potential of a project during the design phase**.

Topic 4

Wellbeing and sustainable built environments

According to the UK Climate Change Risk Assessment Report of 2017, "The number of heat-related deaths in the UK are projected to increase by around 250% by the 2050s (median estimate), due to climate change, population growth and ageing, from a current annual baseline of around 2,000 heat-related deaths per year." Looking at the brighter side, there are also potential opportunities associated with higher temperatures. Outdoor activities may become more attractive, with more people opting commute or travel activities involving cycling and walking. As very little quantitative evidence exists that considers these benefits, we may want to gather data to assess these factors to truly understand the need for built environments in the future.

Ref: What Makes a Good Habitat?
Research in the behavioral sciences (Boyden, 2000; Orians and Heerwagen, 1992; Heerwagen and Orians, 1993) suggests that a good building habitat supports:

- Connection to nature
- Sense of community and belonging
- Behavioral choice and control
- Opportunity for regular exercise
- Meaningful change and sensory variability
- Privacy when desired

Features and Attributes of Buildings Linked to Well Being Needs and Experiences

Experience/Need	**Environmental features and attributes**
Connection to nature and natural processes	Daylight; views of outdoor natural spaces; views of the sky and weather; water features; gardens; interior plantings; outdoor plazas or interior atria with daylight and vegetation; natural materials and décor.
Opportunity for regular exercise	Open interior stairways; attractive outdoor walking paths; in-house exercise facilities; skip-floor elevators to encourage stair climbing.
Sensory change and variability	Daylight; window views to the outdoors; materials selected with sensory experience in mind (touch, visual change, color, pleasant sounds and odors); spatial variability; change in lighting levels and use of highlights; moderate levels of visual complexity
Behavioral choice and control	Personal control of ambient conditions (light, ventilation, temperature, noise); ability to modify and adapt environments to suit personal needs and preferences; multiple behavior settings to support different activities; technology to support mobility; ability to move easily between solitude and social engagement and spaces to support both
Social support & sense of community	Multiplicity of meeting spaces, use of artifacts and symbols of culture and group identity; gathering "magnets" such as food; centrally located meeting and greeting spaces; signals of caring for the environment (maintenance, gardens, personalization, craftsmanship)

Privacy when desired	Enclosure; screening materials; ability to maintain desired distances from others; public spaces for anonymity.

Topic 5

Accelerating transition

UK Green Building Council : Newly constructed buildings are more energy efficient, but **80% of buildings in 2050 have already been built**, so a major priority is decarbonising our existing stock. Yet Government policies aimed at improving the efficiency of existing buildings have scaled back dramatically, and insulation installation rates have stalled.

Direct emissions from fuel use in existing buildings rose for the second year running in 2016, mainly due to heating. Heating alone results in 10% of the nation's carbon footprint and homes are more significant than all other building types put together. Decarbonising our heat supply is one of the big policy challenges ahead. Another major challenge is the carbon embodied through construction. Annual embodied emissions alone are currently higher than the GCB's target for total built environment emissions by 2050.

Finally, the built environment is crucial to allow us to adapt to changing and increasingly extreme climatic conditions. Yet several million properties are in areas at risk of flooding, and the risk of overheating remains very high especially in social housing. Adaptation measures including sustainable drainage systems and flood risk alleviation should be prioritised further.

- Biophilic design elements must be opted over resource-draining block construction.

- Eco-alignment must be approached at the scale of urban planning

Ref: Buildings of the future will place an emphasis on floating parks, rooftop gardens and other forms of urban greenery. Architect and writer Lidija Grozdanic adds that **urban renewal and farming projects will become more popular in future urban planning**. As cities move toward cleaner, greener technology, standards for sustainability will strengthen and architects will need to adapt in order to pass more rigorous standards.

Topic 6

Financial Risk Assessment for Climate Change

Climate-related financial risks – measurement methodologies

A UNEP FI pilot project (UNEP FI (2018), UNEP FI et al (2018)) saw the participation of many banks. The project applied a common methodology aimed at translating climate scenarios into credit risk parameters. The methodology assumes translation of climate scenarios into financial risk drivers through changes in firms' revenues, in the costs of goods, and in property values. These financial risk drivers, as well as the impact of the scenarios on credit parameters, are then assessed at borrower level, focusing on selected sectors or portfolios depending on the type of climate-related risk. Borrower-level impacts are then extrapolated on a sectoral level, and the climate impact is used to adjust credit risk metrics.

Tools that are already in use to inform management decisions include scoring tools such as heatmaps to monitor and manage climate-related financial risks for relevant sectors or portfolios. One example includes a scoring system for individual clients, which starts by identifying sensitive sectors and establishing sector-specific technical risk criteria, before assessing the level of compliance of each client in the portfolio with these criteria and resulting in a compliance score. The process further defines risk acceptance metrics and a minimum threshold for compliance at portfolio level, and the criteria and risk acceptance metrics are reviewed regularly. Some participants report having interactions with clients when they are flagged by a bank's risk officers as being vulnerable to climate-related risks, which are in some cases mandatory according to the bank's regulations.

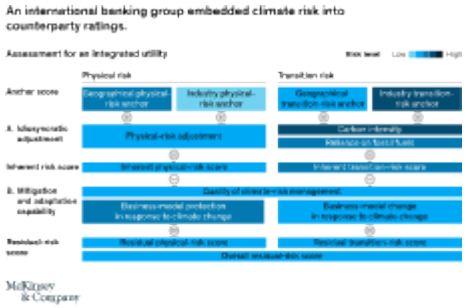
Integrating climate-related risks into credit risk assessment

There are two approaches for integrating climate-related risks into credit risk assessments. On the one hand, there is a risk approach whose objective is to integrate a new source of risk in order to accurately measure credit risk and assumes that a risk differential between green and brown assets exists; on the other hand, there is an economic policy approach, aiming to foster the transition to a low-carbon economy by shifting credit from brown to green activities.

TSP Can Do More to Assess Financial Risk of Climate Change, Watchdog Finds

GAO urged the federal government's 401(k)-style retirement savings program to conduct a more thorough review of participants' exposure to climate change-related risks next year. A federal watchdog agency last week reported that the federal government's 401(k)-style retirement savings program should do more to assess the exposure of federal employees and retirees to climate change-related financial risk.

Banking imperatives for managing climate risk- McKinsey and Co



Climate Change Is a Source of Financial Risk

The bottom line is that every future scenario includes climate-related financial risk, though the level and form of the underlying uncertainty vary. A high-carbon scenario would generate considerable physical financial risk from uncertain extreme events and adverse trends. A low-carbon path would moderate such climate hazards but produce transition financial risk from the possible adoption of new climate policies and technology.

Other references

Bill Bordass

Parag Khanna and a more recent resource

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