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Social and Environmental Sustainable Urbanization: Guidelines for Meaningful Progress

The present conference room paper, which was prepared by Mr. Frank V. Zerunyan, J.D., Professor of the Practice of Governance, University of Southern California, Sol Price School of Public Policy and M. Caroline Stevens, Candidate for Master in Public Policy, is hereby transmitted as a supplementary paper to facilitate discussion on item 3, "Transforming public administration for sustainable development", in accordance with the proposed programme of work and agenda for the thirteenth session of the Committee (see E/C.16/2014/1). The views expressed and content presented in the paper are those of the author and do not imply any expression of opinion on the part of the United Nations.

I. Introduction to Sustainable Development

Today, roughly 51% of the world's population lives in an urban setting and this is projected to increase to 70% of the world's population by 2030.[1] Currently, governments are facing increasing challenges to provide a better quality of life for their urban citizens, especially in fast paced industrializing environments[2]. This raises the question of how the current process can be improved, and what could urban development look like in 20 years?

According to design practitioners, environmental sustainability consultants and progressive government collaborators, algae encased skyscrapers that absorb carbon dioxide and organically recycle water from within their walls are the "downtown trademarks" of the future[3]. Similarly, community hospitals that never use a single kilowatt-hour of energy from the utility grid are a possibility of the near future; as are offices and homes that are built to minimize transportation and waste consumption, improve human health through LED lighting fixtures and optimal placement. According to engineers and urban planners these possibilities will define the trajectory of sustainable urbanization over the next 50 years[4]. The primary question is how this possibility can be attained as a global community and furthermore how policy makers and administrators will recognize the tools to meet this reality?

II. The Need for Sustainable Urbanization

Urbanization can be defined as the movement of individuals from rural to urban areas. Over the past 2 decades the resulting consumption and waste patterns have had severe repercussions on ecological livability and social equality[5]. Issues of urban sprawl, auto-dependency and disproportionately high consumption rates demand immediate remediation in developed or post-industrial regions and cities[6]. Within developing regions, the urbanization process is increasing the environmental magnitude at an alarming rate[7].

As a result it is now the duty of public administrators and governments to devise innovative solutions to abate climate change, pollution, and water ecology challenges in industrialized and post industrialized countries[8]. This paper seeks to address the environmental and social concepts of urbanization, and to recommend

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1 World Bank, [Web site] Annual Projection Data, Site address: http://data.worldbank.org/indicator/EN.POP.DNST2014.

2 Shen Li-Yin, J. Jorge Ocha, Monah N. Shah and Xiaoling Zhang, "The application of urban sustainability indicators – A comparison between various practices," Habitat International 35 (2011): 17.

3 ARUP, University of Southern California and Façade Tectonics Symposium, January 2014

4 ARUP, January 2014.

5 Jeffrey R. Kenworthy, "The eco-city: ten key transport and planning dimensions for sustainable city development," Environment and Urbanization 18 (2006): 68.

6 Kenworthy 2006: 69.

7 Nicola Dempsey, Glen Bramley, Sinead Power & Caroline Brown, "The Social Dimension of Sustainable Development: Defining Urban Social Sustainability" Sustainable Development 19 (2009): 289

8 Kenworthy 2006: 71.

practical policy frameworks for understanding environmental sustainability. We also discuss in this paper practical strategies, pilot projects and new technologies to address these recommendations and speak to practicality of these new frameworks. The guidelines herein provide solutions for economic, social and physical concepts of sustainable urbanization. global development agenda beyond 2015 with sustainable development at its core.

III. Environmental and Social Guidelines for Sustainable Urbanization

1. Industrializing cities and cities in redevelopment phases should collaborate with design stakeholders to achieve a high density, centralized layout.

The shape, form and density of a city will determine its economic viability and sustainable capabilities[9]. More simplistically cities where job growth is centralized, and where basic resources are present minimize their ecological footprint, and create more transit-oriented communities[10]. Data on the urban form of cities worldwide found that urban density was highly correlated with private car use, and that density explained almost 84% of the variance of car travel within a city11.

In addition, this city layout should capitalize on the benefits of the natural environment, which will inevitably lead to the concept of shared water, air and natural landscape and the idea of an "ecological" commons.[12] This increased sense of community will translate into more public space, added community health benefits and more opportunities for locally managed recycling on a large scale, essentially a culture of "green living."

In that vein, public administration and the environmental design communities should seek to maximize mixed land use and seek to eradicate central city parking arrangements.[13] More centralized systems have resulted in shorter average commutes, stronger public transportation ridership, and greater protection of the natural environment within the surrounding region. Similarly, if urban development has not already enveloped all arable land, centralized food production is encouraged in order to secure localized food security among cities in underdeveloped nations[14]. Academic and practitioners alike assert that the next stage is the urbanization of suburbia and the trend towards the urban village as more and more individuals exhaust from commutes, land pressures and environmental pressures[15].

2. Environmental technologies should capitalize on a city's natural and built environments, and these advances will be the touchstone of successful sustainable urbanization.

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9 JM Thompson, Great Cities and their Traffic (Middlesex, England: Penguin Books, 1977) 344.
10 Kenworthy 2006: 69.
11 Jeffrey Kenworthy and F Laube, "The Millennium Cities Database for Sustainable Transport," [CD-ROM] database, International Union of Public Transport (UITP), Brussels and Institute for Sustainability and Technology Policy (ISTP), Perth.
12 Kenworthy 2006: 72.
13 Dempsey, Bramley, Power and Brown 2009: 295.
14 Shen Li-Yin, J. Jorge Ocha, Monah N. Shah and Xiaoling Zhang 2011: 19.
15 Kenworthy 2006: 74.

Cities are consumers of natural capital such as water, energy and other materials and large producers of waste. These technologies propose that the natural systems upon which cities depend should absorb some of this waste and recycle onsite[16]. One example of this methodology has already been embraced in several North American cities and numerous European communities. Living Machine Water Purification and Reuse Systems, which are hydroponic planters and parks that purify and store non-potable water for reuse have increased in popularity significantly over the past decade. These facilities can be deposited indoors or outdoors and provide the ideal excuse for lush pockets of green space peppered among an urban concrete jungle. Just in North America, San Francisco, Greensboro, North Carolina and the state of Vermont have already implemented large-scale organic purification and water reuse facilities some of which can process about 900,000 tons of water annually and have a project payback of roughly 15 years, which is slightly too long for commercial investment at this point. However, this life cycle will decrease as the cost of water skyrockets over the next 10 years across the global community[17].

Similarly, new sustainable strategies in energy modeling and GIS have allowed for incredible design revolutions across the Middle East, North America, Europe and Asia[18]. With the optimal placement of public facilities among the solar canopy, in conjunction with identifying the correct window to wall ratio, and LED lighting installation, these developments can potentially become zero-energy, zero- carbon, zero-waste[19]. By reducing energy loads and adding solar panels, it is possible to create a public hospital, or restaurant that eventually gives back to the utility grid, which is a huge leap considering that hospitals today, along with fast food restaurants, are the most energy intensive building types in our communities.

Several international cities already have construction plans for net-positive buildings, such as the City of Masdar Headquarters in Abu Dhabi. That particular groundbreaking building design will be the first carbon-neutral, zero-waste facility of a large magnitude to actually contribute energy back to the city's utility grid. Sustainability analysts globally have estimated that by 2015, it will be cheaper to install PV solar panels then to connect a new building to the existing utility grid. North America and Europe has already reached this threshold in some places. In summary, technologies such as these can be utilized to further sustainable and economic aims within cities based on the landscape of the natural environment.

3. Structural challenges must be addressed through public cooperation among stakeholders and policy makers.

The central concepts of sustainable design and urban communal engagement have already exhibited major success amongst European cities such as Barcelona, Amsterdam and Malmö. Similarly these principles are gathering traction in the North American cities with increasing validity in west coast cities such as Portland, San Francisco and Los Angeles. But perhaps, the most compelling factor that distinguishes a good city from a bad city is how it collaborates and governs with communal and external stakeholders.

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16 Kenworthy 2006: 74.
17 ARUP, January 2014.
18 ARUP, January 2014.
19 US Department of Energy, Energy Efficiency and Renewable Energy [Web site] Zero Energy Buildings, Site address: http://zeb.buildinggreen.com.

One example of this is the slowly changing landscape of Los Angeles's urban sprawl into a more centralized hub with re-emphasized public transit, bike lanes and increased walkability[20]. Through the collaboration of 191 cities in 6 counties in the Southern California Association of Government's (SCAG) region, a holistic sustainability plan was created that seeks to benefit all participants through the acquisitions of several billion dollars in shared transportation resources and the creation of 4.2 million jobs within the region over the next 30 years[21]. Through collaborative governance, innovation transfers occur and permeate small and large cities alike with the buying power of pooled resource management. In addition, transit oriented development is spurred as opposed to prior patterns of urban sprawl, as regional expert and public affairs and transportation expert, Marlon Baornet, isolated in several Los Angles based publications. In summary, transportation driven planning will spur economic growth and touch on the more complex social elements of environmental sustainability.

These strategic guidelines aim to serve as an amorphous road map for redeveloping and pre-industrial urban environments. However, it is still difficult to define the characteristics or directions for attaining these communal structures, and setting these plans into actionable strategies. Regardless, this stage of urbanization requires immediate and directed planning through a globally coordinated effort in various UN regions.

[20] Southern California Regional Association of Governments, "Sustainable Communities Strategy," (2011): 9.
[21] Southern California Regional Association of Governments, "Sustainable Communities Strategy," (2011): 11.