AN ODE TO URBAN NATURE

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CONTENTS

THEMES

PAGES

86 - 91 92 – 103

OBSERVATION:

MISSING TIMELINE	1 - 2
VOLITION FOR VERDURE	2 – 3
URBAN SETTING	4 – 5
THE GREEN PATCH	5 – 7
NEW MEASURES	7 – 8
SEEDS OF CHANGE	8 – 12
URBAN CHALLENGES	12 – 14
PREMATURE URBANIZATION	15 – 18
'SLUM'ING THE NATURE	18 – 26
GROWTH Vs GREEN	27 – 28
CITIES GOING GREEN	29 – 37
SMART CITY	37 – 45
NATURE ARCHITECTURE	46 – 49
RESISTANCE AND EMBRACING	50 – 55
ΜΥ CITY	55 – 62
THE MEDITATION:	
FINDING ROOTS	63 - 63
HUMILITY	64 - 69
HOME COMING	70 – 75
MY RECENT WORKS:	
FROM 1 st REPORT	76 – 82
FROM 2 nd REPORT	83 – 85
FROM 3 rd REPORT	86 – 91
FROM 4 th REPORT	92 – 103

OBSERVATION: MISSING TIMELINE

As my works are a perusal of Nature amidst Urban settings, I tried to find the commencement of mass urbanization. The human habitat flourished around state capitals and big cities from late 90's. The causes of living interior downtowns and villages are various. Some are driven by developments and there are some less happy affairs. But the period witnessed a mass populace movement towards cities. Finding alternative jobs and an abode by the workplace was what aimed for. People thrive for a city life. Thus the millennium brought a boom in infrastructure along with it.



The infrastructure is somewhat seen as marks of industrial development. And it spoke of paving path for a better living. As the real estate market grew, the marketing brain came to play. Some promised to address the need of people. And some created an atmosphere where people were led to believe that they were lacking a real life. They could try for more in a single lifetime. People trying to find just a roof over their head, were lured towards the glitz of a growing urban formation. The housing projects promised more and more. And people believed them.

The 'theory' of high-rise is lifting the blemished soul from mud and soil. It was a vertical trajectory from the grass

beneath the feet. The marketing-magic showed it as an instance of heightened living, lifting the quality of life. The 'idea' of grace and elegance high above the sea level was quick to sell out. It is still enchanting to think that a life in high rise distinguishes the privileged from the mass.

Affluence is catching the first rays of sun high above the ground, when the alleys below are longing for light. Living is gasping more of the sky-blue when eyes on the land devour only a slice of the smog as the divine bliss. It is fascination to brood over catching the cloud. Enjoyment is lounging the last



beams when the sun has already set on the meadows. And the promises were realized and delivered. It took only a while for people to realize that in reality they were sold out to mere tenet of a life and a partial perspective. The missed the miracle created by mingling of sun, rain and soil. The glory of morning sun on grass and due gave them a slip. The hue of dissolving

sunrays from the tree leaves avoided them. They are barred from feasting on the raindrops on water body, on woods, on empty paths and lanes. The beauty of growing vegetation, aiming the sky, had just avoided them. There square feet castle protected them from the smell of wet dust and moist breeze.

People found them caged. Those were lofty walls in the name of house, fly-ash bricks



empty at the core in the name of dwellings, steel and glass pane in the name of protection, polymer caps on vision in the name of doors. The idea of heightened living had robbed them of a whole timeline of civilization consisting of men and Nature alike, drenching and basking repeatedly.

OBSERVATION: VOLITION FOR VERDURE

What happens then? Are the people completely disillusioned of an urban living? They denounce the amenities once longed for? Returned to villages? No, unfortunately time has passed. More and more were put on stake. People grew old and dependence on an urban setting grew with it. And with this, grew the numbers and counts of lives. The hopes and aspirations are passed on to the generation next. Lives are clinging more to urban benefits. It's now a necessity never to turn away from. With this the unease grew among the city

dwellers and people continue to thrive for something more. The fact that people living an urban life, did not abandon their ancestral house entirely, is a proof of it. Returning to their roots under opening of any occasion or gathering is to seek nature once again.

But what for those whose lives had transformed? The distance from their ancestral living is not measured in miles but years. What for those who cannot return to thorps they once left? It's quite



a phenomenon. They find whatever scope there is. They dig soil and plant saps. They cultivate herbs, bright flowers, palms and various genre of flora. The civic population has grown a niche of gardening. More and more people are coming to be nature lover. They

plant, protect and play with miniature nature. The devote time and energy after their fixation. And what more there are nature clubs and gardening committee among the



housing societies. And at this Juncture, law came to play its role. It was just about time that the mindless shredding of greeneries caught the attention of jurisprudence. Similarly the water bodies were being transferred into solid ground. The nature lovers cried foul. With accented interference the advancement of arid construction was halted. It was a time for introspection.

The marketing managers were quick to apprehend the trend, both among city

dwellers and the law. The growing longing for a green strip among the dwellings caught their attention. They observed that the urbane populous are less than happy with what they were once offered. They yearn for more. To gain an upper hand over the competitors, they incorporated the newfound need of potential customers into their projects. Developers have now developed a new trend of blending nature with living. They advertize condos with a great proportion of open space. The brochure flashes the ratio of living area along with the broad lea, boulevard, and grass-ways. It shows the reach of greenery lounge with even artificial water bodies attached to it.

The area of residential periphery expanded more incorporating changes. With the new trend and norms or urbanization, people were offered de-stressed, serene and peaceful



living. There were overture of greenery and natural light. These constructions seemed to assimilate work-life balance and aimed to keep the occupants' health. The condos pitch for sustainable biological relationship between human architecture and nature. There was not any necessity of any of these added amenities if there had not been a carving for verdancy and an enforcement of law. However with a greater cost urban people now can have the green strip they

were looking for? As for now the concrete-blinded are promised a solace in shrubs. Are they buying it? Will they stay satisfied? It's an answer only time can give.

OBSERVATION: URBAN SETTING

With more and more people coming to cities, its nature is on a constant change. Now, what is meant by URBAN? As historian John Gurda puts it - concentrations of people animated by concentration of capital. Money is the root of all cities. The observation goes as in every age, people have chosen to live in urban areas, not because of their climates or landmarks



or cultural attractions. But because, they offer jobs. It's the economic opportunity that brought people to the urbans, and it is the same economic opportunity that keeps them there. So it inferred that the further one goes from the work place, the lesser takeaways, and the lesser savings. If capital and jobs and business are important, so important is staying

closer to them.

There are more official definitions of cities. As 75% of population of an area is not engaged in agricultural or fishing activities. As human settlements with high population density and infrastructure of environment.

Then there are suburbans. They are smaller in size with less population. It sometimes has a single or a few economic activities. A suburb could evolve round, industries, colleges, resorts or even railway links, the suburbs are placed on the outskirts of a town that is main centre of employments. And they serve the urban core with production units and supply chains or even workforce. As places are occupied with industries and other edifices, there are fewer places for settlements. So



people live little away from these economic centers and they come to suburbs to attain their job places. The places, they come from are called commuter towns. As evident by the name, people lives and sleeps and eats in their houses in these townships and commute or travel to urban or suburban to jobs and businesses. These settlements have little commercial activity beyond a small amount of retail outlets and school and markets, so people can shop and cook and eat and go to towns for work. Literally they come home to sleep and leave those in morning for work, thus giving names like bedroom town or dormitory towns. And people living in the commuter towns, make rooms for others to live in such rooms in order to make money. People rent out adjacent accommodation for rent.



Thus more rooms are built to be rented out or even to be sold. Though these commuter towns, connected to urban and suburban areas, well with rails and roads and ferries, are many officially called extra-urbans or exurbs.

Exurbs are little patches of neighborhoods. They expand on the outskirts of suburbs. They can or

cannot be historically or culturally rich as their urban core. Or, as in West Bengal, where the capital city of Kolkata is much younger to its suburbs or exurbs. And with time these exurbs

grow and inflate into a suburb. As Rick Lyman of New York Times observed, the growth of exurbs into suburbs are like embryonic subdivisions of homes, shops, schools and roads. It is absorbed into urban boundaries and expansion of suburbs and exurbs starts again on outskirts as an ever expanding cycle. Then these the core, adjacent urban areas, less populated territories, sharing industries, infrastructures, housings, suburbs, exurbs,



satellite townships, of this suburbs, that are socio-economically tied to the central urban nucleus and presume to influence it, is called Metropolis.

OBSERVATION: THE GREEN PATCH



Now why is the matchstick description of a metropolis, urban, suburban and exurban are needed? Only to know what actually separates them? Its the patches of green. The further one goes from core of a city to its outer rims, the more green catches one's eyes. A few miles of greenery separates the exurbs from suburbs. And a few patches of green distinguish suburbs from

urban centers. Why are there suburbs and exurbs? Primarily for they have lesser economic activities. Fewer costs of living with standard transport system. And more for there is no

place for growth in cities. And there is the volition for verdure that prompts the city dwellers to move out of the cities, into the surrounding green belts.

To watch closely, less human activity gives room to more vegetation. Less edifices and factories means more land fir nature to grow. Low living cost means less buildups and minimum amenities. It is more than enough



for a sapling to spout out. And good transportation encourages people to stay a little further interior. So the green patches between urban and suburbs and exurbs are less prone to be destroyed. Rural, wooded or agricultural land forms a breathing relief to an



otherwise ham plot of concrete monotony. The jurisprudence comes to rescue the green once again. There are restriction using submerged lands, water bodies and agricultural lands. It puts a boundary to an insane urban growth. It helps nurture nature amid concrete menace. It slows urban sprawl by barring the builders to dump city waste and fly ash in shallow low lands and stand a multistory. It cradles an ecosystem to form phytoplankton to fierce plants.

Thus nature exists and multiplies in cities seeking a vast open space or even the smallest

pockets round the blocks. Though very little and fragile, green strips still do exists on the outer periphery of one's house. A little on the edge on the boundary wall and in even a false feeling of could have been a lawn. In most humble lines of marigold plants, creeps on hedge, palms inside an air conditioned room, bonsai on centre table.

The intervening rural land between two buildings is socio-economically connected to the



neighborhood. The free land adjacent to houses is dotted with fruit plants and herbs, especially in Indian subcontinent. Though selling homegrown fruits and veggies and herbs are not a common practice, the land-owners use the land at his will.

But this specific movement of nature is not far from threat. As it is seen that the growth of metropolis is embryonic, the ever expanding nature of urban super-built is mounting



nature of urban super-built is mounting pressure on nature. If growing fruits and veggies seem less needed to the lure of constructing condos on the land at disposal, to rent them out and earn more, the land-owner will fall for the later. The need of staying close to workplace brings an urge to spend money with it. It is easy for the land-owners to fall a pray to earning more profit. The overwhelming urge to find a roof, tends to curb the free will of nature.

There is more somber phenomenon. As there is bigger player in the property market, these sharks stuff as little money as possible to the need and destitute of people and devour up the lands. The owner of a fragile piece of land is given money and driven out from his own habitat. As the cost of land soars, every inch of free space, bears a price tag and prone to contribute to the concrete build-ups.

OBSERVATION: NEW MEASURES

Scientists say, urban areas were expanding so rapidly in a complex non-linear way, that the existing models of studying urban ecology, biodiversity and Ecology as a whole, has failed to capture it. The ingrained perception in ecology that- urbanization intensity is the same in all cities round the globe in all times and it runs from the core to the city fringes resulting a cascading and step by step environmental changes- does not apply easily to contemporary patterns of urbanization. Historically, cities grew slowly in a relatively compact manner, through progressive rings of urban development. But contemporary patterns of expansion were markedly different. Cities are growing very rapidly on a vast area but in an untidy manner. They are increasingly expansive and dispersed and sprawling in spider-like configurations across large distances and embedding fragments of other land uses in the rapidly changing landscape. It is driving the large-scale loss and fragmentation of natural and semi-natural habitats in several countries and cities worldwide. Urbanization is one of the main drivers of biodiversity loss. So, if contemporary cities expand in a complex, non-linear manner, then the assumption that

urbanization intensity on a simplified straight timeline based on a site's position along a linear urban-to-rural gradient can be misleading. The simplified measures also failed to adequately capture the effects of important drivers, such as landscape fragmentation and imbalances. The running study does not include observation of the inter relations of cluster



urbanization that does not have a direct connection. As it does not have a temporal dimension. The findings appear in the **Trends in Ecology and Evolution** journal, as put down by coauthor Cristina Ramalho, a researcher from the University of Western Australia's School of Plant Biology. The researchers suggest, the Ecologists could look for alternative tools of study. That would include assessment of the impacts of an urbanizing

landscape by looking at the changing attributes of a particular area, the characteristics of a neighboring landscape and ecological question of interest. Ecologists should also consider the temporal dynamics of landscape change, how the change in land-use history affects the urban plants and ecosystems, how the biodiversity responses to on-going environmental change with either the intensity or the time lags of building city blocks. This would help policymakers and planners to have insight into the remnants environmental conditions. For example, how urban nature grows and survives and sustains on the lands that were recently fragmented or those plants having history of repeated land-use change. This would add to the conservation value and, therefore, be used in prioritizing conservation.

OBSERVATION: SEEDS OF CHANGE

As per the findings appear in the Proceedings of the National Academy of Sciences, laid by co-author Marina Alberti from the University of Washington's Department of Urban Design and Planning, there is a clear urban signal of phenotypic change in plants in urbanizing systems compared to natural or non-urban anthropogenic systems. The Phenotypic change refers to change in an organism's observable traits, such as it morphology, physiology, phenology and include alterations in body sizes, shifts in patterns and adjustments in reproduction. In a separate study, researchers in France, which include



Pierre-Oliver Cheptou from Centre d'Ecologie Fonctionelle et Evolutive (CEFE), based in Montpellier, observed a rapid evolutionary change in a plant's seed size in order for it to adapt to urban life.

They found that the seeds on Crepis sancta, otherwise known as hawksbeard, were larger on specimens that lived in urban areas, when compared with the seeds from the plants growing in rural settings. As the plant's seeds were dispersed by the wind, the researchers



suggested that heavier seeds fared better because they would drop on to nearby soil, whereas the lighter seeds would be carried by the wind, resulting in them being deposited on concrete and asphalt, where it was impossible to germinate. Seed samples were collected from the weed, growing road-side, from various locations around cities. They were grown in a greenhouse to see the effect of light, wind-dispersible variety. Compared with specimens taken from the countryside, the urban samples produced far fewer next

generations of seeds. 'Dispersing' seeds had a 55% lower chance of germinating because the majority ended up on concrete surfaces. The heavier seeds were at an evolutionary

advantage because they would fall down into the patch of soil that had supported the previous generation of the plant.

Is too fast, too bad? Researchers say that this might be a risky affair. The change in dispersing seeds has taken place in as little as 5 to 12 generations or within five to 12 years. The team was surprised by the speed of the change as logic of any bio science branch says that this sort of evolutionary trait would develop more slowly. Changes of



these kinds affect not only biodiversity but also, for example, nutrient cycling, food production or even water purification.

The prevention of infectious diseases would also be modified. And that is not all. There are the 'Cost of Dispersal' theories. It renders that when chances of survival are less along with

the frequency of suitable habitat, such as on an island, the plants reduce in dispersal structures in seeds. The same also applied to plants in urban areas, where suitable soil has been widely fragmented by buildings, pavements and roads. Such a strategy of increasing the odds of survival for the next generation could have it own drawbacks. The evolution towards lower dispersal leads to more isolated populations, increasing the risk of extinction. These could be pollution, overheating, over raining or diseases,



as the cities round the globe is witnessing. And it could wipe off an entire generation of such plants growing in urban corner.



Perhaps Nature is abreast of this stake its taking and is ready to cope with the effect. By eliminating the glitches, the urban green continues its fight. Plants from traditionally urban areas could be genetically better suited to fighting infection, observes a team of the University College London and Royal Holloway, part of the University of London and as reported in the journal Evolution. Many plants carry a specific gene variant known to give them resistance from viruses and other pathogens. It was more common in those from areas with a longer history of urbanization, where extinction of plants due to the diseases was more likely to have been rife at some point. This they call an elegant example of 'Evolution

in Action'. Then it's an example of 'selective pressure theory' in relation to disease resistance. It happens because, when urban plants is exposed to a killer illness, the plants

which are best placed to pass on their genes to the next generation, are those whose genetic make-up helps them fight the infection. As mass extinction of urban nature, other than direct human intervenes, due to infectious disease is theoretically higher, so the more



likely it is that these resistance genes will be spread widely among the next generations. The protective gene variant was found in nearly every urban plant where cities have been established for thousands of years, and they were either planted or found a foothold themselves, but were less frequent in regions with a shorter history of urbanization. Plants that are more resistant to a pathogen that causes a disease with substantial mortality, will survive better

and will contribute more offspring to the next generation. As many of their saplings will have inherited increased resistance to the pathogen, they also will survive better. Studies are on to find whether the trees are coping with climate change that brings conditions like sudden rain which submerges the cities for days leading to rotting of roots or scorching

heats in extended summer, those cities near to tropical belts endure that parch up the leaves. ls revolution in action covers protection to vitality o urban nature as the city chokes on diesel fumes?



In analysis of more than 1,600 cases round the globe, researchers said changes from urbanization is affecting ecosystem. We live on an urban planet already and urbanization, globally, is clearly affecting nature. We are urbanizing the planet and that significantly

changing the evolution of Earth. The planet is now entering an Anthropocene epoch, a geological measurement of time in which humans are having a consequential global impact on the Earth's geology and ecosystems.



OBSERVATION: URBAN CHALLENGES

The world is fast approaching the point where the majority of the human population will be found in urban areas. Huge rise in the number of people making their homes in towns and cities is a recent phenomenon. In 1950, less than one-in-three people lived in urban areas.



The world had just two so-called Megacities with populations in excess of 10 million- Tokyo and New York. Today, there are 28 of them, home to 453 million people or about 12 percent of the world's urban dwellers. By 2030, the world is projected to have 41 mega-cities each having 10 million or more inhabitants. Greater Tokyo, the world's biggest city, will expand from 13 million residents in 1950, to 37 million in 2030. The next is Delhi million in 2030. The next is

Delhi with 36 millions. Shanghai with 30 million, and Mumbai, Beijing and Dhaka with 27 million each. Karachi, Cairo and Lagos will stand at 24 million chased by Mexico City at 23 million. The United Nations estimates that about 1,80,000 people are being added to the urban population every day during these years. This means the world's urban infrastructure

has to absorb the equivalent of the population of two Toykos each year. North America and Europe's urban areas already account for about 80 percent of the regions' populations. Developing nations are shouldering the vast majority of this burden, leaving them struggling to cope with the huge influx of people into urban areas. Some cities' populations are 40 times larger than what they were in 1950.

The world's largest Megalopolis Chain is perhaps the Taiheiyo Belt or the Pacific Megalopolis of Japan having a population as high as 83 million. Though in the Rust Belt, Great Lake Megalopolis including big cluster of cities of USA and Canada had an estimated population of 59 million and projected to reach about 70 millions by 2025. China's Guangdong Province's Pearl River Delta Megalopolis belt holds 48 million people. Some

projection assumes that by 2030, over 1 billion people will live in China's areas. urban Brazil's Rio de Janeiro-Sao Paulo megalopolis houses 45 million inhabitants. Seoul National Capital Ares spread over 10,000 square kilometer houses 24 million people. Europe's



largest metropolitans are London of 13. 6 million people, Paris of 12.4 million and the Rhine-Ruhr Region of 11.5 million people. However they are often put under one belt named the Blue Banana or Golden Banana. Canada's Golden Horseshoe belt holds 9.2 million people.

The world's urban population in 1950 of just 746 million has soared in decades since. In 2009, the number rose to 3.42 billion surpassing the number of 3.41 billion living in rural areas since then the world has become more urban than rural. This was the first time that the majority of the world population lived in a city. In 2014 there were 7.2 billion people living on this planet of which the global urban population comprised 3.9 billion. The

Population Division of the United Nation's Department of Economic and Social Affairs at that time predicted that the urban population would grow approximately 1.84% per year



between 2015 and 2020, 1.63% per year between 2020 and 2025, and 1.44% per year between 2025 and 2030. By 2050, it will reach 6.4 billion, with 30 percent of that growth to come from three countries- China, India and Nigeria.

Overall, nearly half of the world's 3.9 billion urban dwellers reside in relatively small settlements with fewer than 500,000 inhabitants, while only around one in

eight live in the 28 mega-cities with 10 million inhabitants or more. Many of the fastest growing cities in the world are relatively small urban settlements. Since 1950, the rural

population of the world has witnessed a slow growth and is expected to reach its peak around 2020. The global rural population is now close to 3.4 billion and is expected to decline to 3.1 billion by 2050. While Africa and Asia are urbanizing rapidly, the regions are still home to nearly 90 per cent of the world's rural population. India has the



largest rural population with 857 million, followed by China with 635 million. The balance is set to disarray.

OBSERVATION: PREMATURE URBANIZATION

In the traditional model of urbanization, which North America and Europe experienced during the Victorian era, people were pushed away from the countryside by the

mechanization of agriculture, and pulled towards urban areas by the offer of jobs and wages. It's rather chain of progress. The industrial revolution, invention of machines due to advancing science and technology, has spur up factories as helped grow more crops. The revolution in communication and transport had brought the tows into the villages. Thus the radius of development has increased in diameter to reach the fringe population. Then the people



providing physical labor was on excess in rural areas. Similarly in urban areas part of budding industries were agro based, which paved path for more mineral and material based



industries. They all needed labors. Then this surplus toil machines turned their faces rural from to urban opportunities. When they come to towns, many of them were well off from the vast farming of crops and cattle. Sometimes they looked for property in economic and cultural hubs. They might venture into other merchant foray.

But the story is not the same in this era. Sub-Saharan Africa, which has the world's highest rate of urban migration, is not following this pattern. The size of these cities, they move to,

bears no resemblance to their economic wealth. The towns are experiencing what the UN's human settlements UN-Habitat, calls agency, Premature Urbanization. The agricultural sector is not flourishing and urban areas are not generating economic growth which could attract higher wage labors. But the are failing due crops to continuous drought cycles added to infertile land and lack



of irrigation. There are natural disasters, endemics, conflicts, riots, genocide by terror groups. People are forced to flood into towns and cities to save their lives.

This brings to an understanding of slums weaved into the symmetry of urbanization.



Currently, about 36 percent of Africa's population lives in urban areas. But the continent is experiencing urbanization rate twice as high as those seen during the West's industrial revolution. It is predicted that Africa will be an Urban Continent by 2030, not due to urbanization, but as most of the population will come to cities. And as the urban areas economically are

stagnant or in recession, local authorities do not have the money or expertise to provide services such as access to water, housing, education and healthcare. As a result, 70 percent of Africa's urban population find themselves living in slums. Africa is not alone. An estimated 1 billion people in Latin America, Asia, as well as Africa, live in slums or informal settlements that are not legally recognized. This number could double by 2020.

The scenario is happier halfway round the globe. In Asia, China's urbanization has followed the traditional drivers experienced by the West. Its industrial revolution is the most rapid

the world has seen, and millions of people migrated from rural to urban areas to fill the jobs generated by the economic explosion. So, as West is not possible in this point of time, why not Africa and Latin America is not following China's large-

scale poverty reduction strategy? This could act as a framework for others to adopt. It's a pity that not all regions have the export markets and trade links that China enjoys with Middle East, East and South East Asia. And there are controversies of doctoring the value of currency Yuan to boost exports.



contradictions. The Chinese say they have helped lift more than 200 million people out of poverty. Not everyone sees it that way. Anti-poverty campaigners say many workers receive low wages and live in poor conditions. An estimated 2,00,000 people each year move to slums on the southern outskirts of the capital, Beijing. UN-Habitat says the Urbanization of Poverty has been overlooked.



as the both spouses go out to support staffs like drivers, helpers, online delivery man and adviser crew and other

How is the Indian part this story goes? The service section, a significant employment generator next to agriculture, has played a dramatic role in India's growth story, contributing more than half of the national income. In the changing demographics, a young,



affluent populace migrates to urban conglomerate. These bachelors or nuclear couples look for shelters in cities. And work, they need laundry, maids. and financial support aid staffs like even

door to door health check-up paramedics or dog walkers. And their disposable income draws these staff from far interior villages, ex-urbans to the core or the cities. But with the trifle income these migrants are not in a position to afford decent roofs over their heads. Thus this urban poor either occupy the vacant land themselves or make minimal infrastructure on already occupied lands, their resting places. This forcible occupation results in squatters and slums. Such clusters of depleted shanties have reached alarming dimensions.

OBSERVATION: 'SLUM'ING THE NATURE

The mowing of nature lies in the very germination of slums. It eradicated the spout, and tiny leaves, grass and the unnamed flower that is seen blooming by a wary way. As the

formal term goes, a slum is the heavily populated informal settlement in or outskirts of city characterized substandard by housing and squalor, lacking organized sanitation, clean drinking water, electricity, health services or even law enforcement. Slums have been there from 18th century in United States and Europe. The first



germs of slums were seen at the Lake Collect in late 1700. The lake was surrounded by



slaughterhouses and tanneries, which emptied their waste directly into this lake. Trash piled modern waste collection and sanitation system, electricity and other technologies had yet to be invented and adopted. The lake was a reeking cesspool. By the early 1800s Lake Collect of New York City was filled up and dries, and on it was United States' first shanty culmination. it was named Five Points in 1825. This rookery was

occupied by successive waves of freed slaves from Irish, Italian, and Chinese to

immigrants, rural fellow, persecuted souls from Europe. Bars, bordellos, squalid and lightless tenements lined its streets. But today, Five Points has transformed into the Little Italy and Chinatown neighborhood of New York City. Slums were found in every major

urban region of the United States in the early 20th century, but Five Points were the instance of ruining of nature and making it into a skid row and then incorporating inside a city. The word 'Slum' was not originated then. slum is a British slang word originated round 1845, as shanties were first seen in the East End of London. Thought originally it meant- room, the word also indicate 'only a room to sleep by dingy narrow ally'. Thus 'back slum' indicated- 'back alley, street of poor people.' The Old



Nichol at East End and the Devil's Acre in Westminster, London, where massive and rapid urbanization of the dockside and industrial areas of led to intensive overcrowding in a



warren of post-medieval streetscape. Slums were widespread in Paris and other urban areas in France in the 19th century, as in most industrialized European capitals. Following the WW II rural French migrated to Paris, landlords slums. The spreading increased the rent only to raise it above their reach. Then French govt. brought laws putting a ceiling on rent and the housing projects were

unprofitable. Thus both ways slums increased. In spite of bringing of several laws and commissions, the slums were not removed. Rio de Janeiro documented its first slum in 1920 census. By the 1960s, over 33 percent of population of Rio lived in slums, 45 percent of Mexico City and Ankara, 65 percent of Algiers, 35 percent of Caracas, 25 percent

of Lima and Santiago, 15 percent of Singapore. By 1980, there were about 25,000 slums in various cities and towns of Latin America alone.

Occupying vacant land and destroying nature is directly linked to the results of failed economic policies. Apart from jobs, it's amenities of education and health services drag rural fellow to urban outskirts as this migration is evident in the decreasing contribution of agriculture in GDP. In slowing economic growth rate the labors get paid less. Population growth rate surpasses the economic growth rate pulling down the per capita income. This rural lot seeks a slum and not a proper house. As unskilled, they are denied of an instant

job. And if they get a job, the scanty payment brings them to slums. Moreover they lure others these low to payment jobs, who rush to occupy more land. The drought or flood or economic



stagnation pushes them. The non registered and non licensed trade is unorganized sector and it booms due to excessive red-tapes, bureaucratic tangle, corruption, ambiguous entrepreneur and labor laws and getting loans. Thus the labors stay outside observation and enforcement of minimum wage norms. So these people can't afford a decent housing. Study says in developing nations up to 60 percent entities could be non organized. 40 percent contribution in GDP comes from informal business. In Kenya 78 percent of non agricultural revenue is generated by non organized sectors, pouring 42 percent in GDP. 60 percent people in cities and 75 to 90 percent people in slums are the workers of unorganized sector. The World Bank and UN habitat puts that 80 percent of additional jobs in urban areas of developing nations is low paying jobs from informal sector. The city expands, with all these poor populace, e buffer land with it's flora and fauna comes into the urban perimeter. The land is fragmented and its use is changed. When farmland is used for infrastructure, the farmers' land is decreased along with the income it generates. And there



is head surplus compared to lands. As the land rate increases they cannot hold their piece of soil and migrate to slums, as the land he left is too highly money-fetching that the developers care a fig for nature and ecosystem. This is too the mindsets of the corporate who, driven by the

trend of conglomerate, brings separate business entities under one roof. This concentrates the labors round the industrial park as the capitalists get low cost labor. With increase of slums this destroys nature with uniform stockyard, transportation, warehouses.

And there is lapse in the government side. Its administration level and political ignorance

that lets the rural poor clot in slums that encroaches the vacant land. In most cases its lack of money and bureaucratic coordination with that licenses the slum. Then, comes the inexperience in handling the great flux or the apathy to admit the migration. Govt. doesn't admit that а slum even exists on its jurisdiction. They fear that a quick official recognition will encourage more slums and seizure of land



illegally. Recognition and notification of slums often triggers a creation of property rights and the dwellers demand that the govt. provide public service and infrastructure to them. But these do not generate tax revenue and therefore tends to get minimal or no attention. With this dense population slums' demand far exceeds the Government and bureaucracy's ability to deliver. Govt. hopes that with economic growth the life of the miserable people will heightened and the slums will transform into registered houses. It relies on privateers to build houses with the increasing demand. But a housing project drains multiple fortune



and the not so philanthropic traders turn to upper middle class to recover them. So once occupied, the nature never creeps back in urban setting.

And even if the Government turns philanthropic to slums, it's still disaster for Nature. In Mexico City basic amenities

such as concrete roads, parks, illumination and sewage were arranged to completely urbanize them. In Tondo slum near Manila, Philippines, slum residents became property owners with a stake in their neighborhood. in Medellin, Colombia, where streets, Metrocable transportation and other public infrastructure has been added along with tube-rails and highways to give the

poor reliable access throughout the city and empower not only slum dwellers but all city

residents as a whole. The idea was that, if slums are given basic services and tenure security, they are not destroyed and residents not evicted, then the residents will rebuild their own housing, engage their slum community to live better lives. Over time, this property would attract



investment from government and businesses organizations alike.

Squatters have shown great organizational skills in terms of land management and will maintain the infrastructure is provided. Thus contrary to popular believe, Government starts building infrastructure round and amidst slums. It takes quite more amount of lands



that the perimeters of original slum. And there are failures too, which impacted the nature in worse way. The slum upgrading projects in Kampungs of Jakarta Indonesia, looked promising in first few years after upgrade, but thereafter returned to a condition worse than before in terms of sanitation, safety of drinking water. Communal toilets provided under slum upgrading effort were poorly maintained, and abandoned by slum residents of Jakarta. In Philippines, India and Brazil the condition of the slums 10 years after completion of slum upgrading has been slum-like. The anticipated benefits of slum upgrading, have proven to be a myth. Slum upgrading is largely a government controlled, funded and run process, rather than a competitive market driven process. Conflicting politics, government corruption and street violence in slum regularization process is part of the reality. Slum upgrading and

tenure regularization also upgrade and regularize the slum bosses and political agendas, while threatening the influence and power of municipal officials and ministries.

Dharavi, the biggest slum in Mumbai is an instance of destroying the city fringe nature. In 1884, then British government expelled industries like tannery, harmful



to environment, to the northern outskirts of then Bombay. The workers migrated with it too and made shanties.

(23)

In 1945 this became the biggest slum in India. And it's still hazardous to the health of its habitats and the nature of adjacent area, if there is any left. In developed countries, it is easier to distinguish the slum-areas from the rest of the city. In the United States, slum

dwellers usually are in city pockets and inner suburbs, while in Europe, they are more common in multi-storied housing on the urban outskirts. In some especially cities, in countries in Southern Asia and sub-Saharan, slums are more than just marginalized neighborhoods holding a dense population, but there the slums are widespread,



and are home to a large part of urban population. These are sometimes called slum cities. If the transportation infrastructure is inadequate, the cost of travel rises. The poor labors try to save money by staying near the workplace. The study says 1 percent increase in infrastructure decreases the growth rate of slums by 0.35 percent.

But is that possible in given situation and it that by far could be linked to conserving ecosystem? The answer portrays a grim picture. Over 5 people sometimes share a 10x10



shed in slums of Kolkata. In kibera slum of Nairobi, Kenya, population density is estimated at 2,000 per hectare or about 5,00,000 in a square mile. These densely populated slums are vote-bank to political parties, who try to keep them intact and relocate, upgrade, remove or relocate the slums into housing projects create a conflict of interests. There are political, ethnic and criminal groups inside the slums

who want to maintain their economic, political and social power inside these slums. So these patronage networks keep the slums alive by bringing rural folks, so that they continue to

harness their existence. They reject any modifications of slums. They device the ploy of naming the slums after political party leaders or party founders to harvest benefits and form a shield against eviction. And this ploy sometimes garners official support and gets some of the infrastructure such as paved roads and unreliable electricity or water supply. As



the city expanding round these slums, with factories, retail, entertainment, housing and transit hubs, the land become valuable property to leave.

It was not this from beginning. The migratory workers occupy less desirable lands by trashyards, swamps, by the railtracks, dry canal-bed, and

marshlands. All this, for not catching the eye of city authorities and law enforcement or slum commissions and finding an edge to hang on. Moreover these lands had no clear title ownership and the occupants know that they were encroaching. Figures put it as 51 percent

of slums are based on invasion to private land in Sub- Saharan Africa and west Asia, 10 percent in South Asia, 40 percent in East Asia, Latin America and the Caribbean. The material used for housing are cardboard, plastic, earthen floors, mud and wattle walls, wood held together by ropes, straw or torn metal pieces as roofs. Almost makeshift style sheds were built.



These shanty houses carpet the nature temporarily as the dweller had a sense of non permanency. But when they start to pay the gangs inside the slums for staying, they built rooms with more permanent materials like bricks and cement. With no room to expand the slums grow vertically making it multistory accommodation for rent.

And when fee to enjoy liberty in slums are paid by the people, this gives them a sense of property rights, boosting their will to stay. And as the land has no clear title ownership, the govt. cannot develop the land into standard dwellings. These rob off even the tiny scope for the nature to bounce back.

Apart from these a few slums were made by colonial white skinned masters for cheap labors like in Kenya in 19th century and for ethnic cleansing in Nigeria and South Africa under pretext of keeping the city clean and fighting plague. And in Lebanon and



Afghanistan, slums formed by civil war. Slums of Port au Prince and Dhaka were created following natural calamities. According to UN-Habitat, around 33% of the urban population in the developing world in 2012, or about

people, lived in slums. The

million

863

proportion of urban population living in slums was highest in Sub-Saharan Africa with 61.7 percent, followed by South Asia with 35 percent, South-east Asia with 31 percent and the least is north Africa with 13.3 percent. Among individual countries, the proportion of urban residents living in slum areas in 2009 was highest in the Central African Republic with a whopping 95.9 percent. The world's largest slum city is in Mexico City.

OBSERVATION: GROWTH Vs GREEN

As per the Ministry of Urban Development the Indian Urban Population from current 32.8 percent of total population is likely to cross 52 percent over the next 20 years. India's population is likely to cross 152 crore surpassing China of 141 crore in 2030 itself.

Thus the entire urban infrastructure needed to be doubled. And the population needs infrastructure, built over last 150 years, in just 20 years. A whooping 64 crore Indians, well over 50 percent of the total population are below 25 years of age and more than 65 per cent below the age of 35. They are being offered job opportunities and starting salaries never before. Urban



Population of 42 crore is also likely to double in next 20 years who would be looking for houses, places to shop, entertainment and work. This population tends to live in their own houses or apartments due to the trend of nuclear family and affordability of the younger generations. 65 percent of property buyers fall between the age group of 25 to 30 years compared to previous instance of grey hairs buying houses at the fag end of their career.



India is presently at a shortage of at least 30 million dwelling units. The state of West Bengal presently has a shortage of at least five hundred thousand dwelling units and would require one hundred thousand additional dwelling units every year for the next 25 years. Population of the City of Kolkata will be 20.56 million, 33.04 million in 2050. The real estate will indulge into business of Rs. 10,00,00,000 crore or USD 2.5 trillion in India over next 20 years which is likely to grow at an annual rate of 10 to 15 percent during these two decades, much faster than the growth of Indian economy. Now estimate the

immense cost it will havoc on nature. This grand momentum of growth and development, in next 20 years, will wipe out every visible patch of green seen between urban, suburban, exurban and rural hubs. This poses a two was destruction of nature and the patches of city Firstly greens. the urban nature is mowed by the slums crunching everv room for



'planned urban extension area'. The nature growing on the fences and concrete border outposts just vanishes. Secondly, the developers have optimized this situation in building self contained satellite townships. These incorporate house, commerce, healthcare, education, shopping and entertainment centers. Thus the very idea of housing complexes will inflate till blowing out of proportion. With this rate of population growth and construction, the face of earth is ready to go reinforce-grey. And as some fear the boundary of aesthesis, logical aspect as well as the land use history with its legal ceiling along with conserving bio diversity, will be crossed. Human existence is on expense of more and more Nature. Is humanity ready to bear the cost?

OBSERVATION: CITIES GOING GREEN

Well, as my previous observations tell me it's a gloomy situation with no hope at all. But that is not the case. As a student of nature in most extreme conditions, I have learned that there is hope and the silver lining is betting bigger and brighter. The cities around the world are getting green.

1. China 'Forest City'

In 2016, China released guidelines forbidding the construction of bizarre and odd-shaped buildings, lacking character or cultural heritage, shifting their focus to the 'economic, green and beautiful'. Now the Liuzhou Forest City, in southern China, takes an advantage of just

that. The 342-acre, selfcontained neighborhood will comprise more than 70 buildings including homes, hospitals, hotels, schools and offices, all of which will be covered with 40,000 trees and almost a million plants. Eventually, up to 30,000 people could call the Forest City home. The plant life is expected to absorb almost



10,000 tons of carbon dioxide and 57 tons of pollutants per year, and produce 900 tons of oxygen a year, while also decreasing the air temperature and providing a new habitat for



displaced wildlife. Solar panels on the roofs will collect renewable energy to power the buildings, while geothermal energy will power airconditioning, adding to the project's green appeal. Underneath the trees, the building's curvilinear shape will be peeping. Pollution is at a killing high in Beijing and Shanghai. But at the same time

China has to create cities to accommodate the population. It will happen if controlled by the government or not. The only way is to indulge into it and guide it from going astray. The Chinese government announced last year that it planned to move two million people from remote villages into cities by 2020 in an attempt to alleviate rural poverty, and as a show of modernization. Thus this is the first experiment of the urban environment that's really trying to find a balance with nature - the melody of architecture and a place where nature is flowing. As bringing forests into the city is a way to reduce climate change.

2. Vietnam 'Empire City'

And there are plans for a spectacular 'sky forest' in Vietnam which will change the face of the central Ho Chi Minh City. Featuring an observation deck and an urban garden hundreds of feet above the ground, it's named Empire City. At 1093 feet, the largest of the three

towers, Empire 88 Tower, will become one of Vietnam's tallest buildings upon completion. But while the structure is likely to stand out from its urban surroundings, it was inspired by Vietnam's geography and intended to blend in with its tropical environment. It had a very intense network of public spaces. Located on the Saigon River a peninsula, Empire City will comprise residential, commercial and public spaces.



The hotel and co-working spaces will be stretched out into outdoor areas for exercising and socializing. It's called the 'Sky Forest' for its urban garden protruding from the building's



upper reaches. The building's podium, a base from which its three towers emerge, is expected to host water features and an abundance of plant life. It is nature, as living space, that comes back into architecture. Where 'green' is not merely a sense of alibi or a discussion of sustainability, but where it's really about the quality of living that we can generate.

3. Thailand 'MahaNakhon'

The 'MahaNakhon' is Thailand's tallest building and was named World Building of the Year in 2015. There is an ambition to create meaningful places for the city's people, and to create a new identity that can be an arch between their past and their future. On a grassroots level, there is an incredible entrepreneurial spirit in this nation and a big start-up culture and even a big co-working culture. All workforces that mark the Western world actually thrive intensely here. The great momentum exhibits how, through architecture, a contribution to the Nature is made.

4. Italy 'Vertical City'

And there is Vertical Forest, two residential towers in Milan, Italy, covered in the equivalent of five acres of forest. Completed in 2014, they remove 17.5 tons of soot from the air each year. It proves that creating an urban environment amid forest is possible. When architecture falls for fashion then, in most cases, it becomes problematic. But these efforts are very pertinent and important in bringing the density of the city back to being a more livable environment.



5. UAE 'Masdar City'

United Arab Emirates will run out of oil any time soon. It has reserves equivalent to 98



billion barrels, enough for the nation to rank 7th globally. As per the World Bank figures UAE consumes 18.4 tons of Co2, nearly 4 times higher than global average. But the nation is sweeping away from crude solutions and swapping them with ones of eco-variety. Abu Dhabi has announced a new energy strategy and 163 billion dollar of investment in alternative energy over the next 3 decades. These changes taking place on a macro level, will

guarantee to transform Dubai. The Emirate's aim is to produce 50 % clean energy by 2050, 44% of that from renewables, and increase energy efficiency by 40%. The nation has already embarked on huge government-funded green housing project- 'Masdar City' in Abu Dhabi for example has funding commitments of 13 billion dollars. But private companies are also playing their parts. A model of what future 'green' communities would look like is being constructed as 'Sustainable City', a 5 million square foot complex that would consume zero

net energy with the potential to go off-grid, the first of its kind in the UAE, the makers claim. The Sustainability City's 500 homes located 18 miles from Dubai City, are powered by

solar panels capable of achieving 10 mega watts at their peak. Dubai's 300 plus sunny days make solar energy a very predictable resource. Yet while the rooftops soak up rays, houses are oriented to avoid direct sunlight inside, keeping interiors cool. As part of the communities' award winning model, all water is recycled on sight. All complex is car free and the community grows its own vegetables all within 11 biome greenhouses. On top of this the site features a 1,61,000 square foot plaza with retail spaces, offices, and eateries.





6. Denmark 'Project Zero'

To succeed, citizens of every nation need to commit to such projects. But it's possible even in places that were not built from the ground up to be eco-friendly. Places like Sonderborg in Denmark have implemented 'Project Zero', a plan to transform it into zero carbon locales by 2029. Using 2007 as a baseline, the 76,000 strong

population has already cut emissions by 35% by introducing high-tech solutions including electrical vehicle charging points, but also education programmes to help citizens make greater greener choices.

7. France Electric Cars

France is set to ban the sale of any car that uses petrol or diesel fuel by 2040, in what is called a French Eco-Revolution. France planned to become carbon neutral by 2050. Hybrid cars make up about 3.5% of the French market, with pure electric vehicles accounting for just 1.2%, as new French President Emmanuel Macron has openly criticized US environmental policy, urging Donald Trump to 'Make Our Planet Great Again'. President Trump's decision to withdraw from the Paris Agreement in June was explicitly named as a

factor in France's new vehicle plan. Manufacturer Volvo said all of its cars would be at least

partly electric from 2019, for about 95% of the European market. Other set in the French targets environmental plan include ending coal power plants by 2022, reducing nuclear power to 50% of total output by 2025 and ending the issuance of new oil and gas exploration licenses. Norway, which is the leader in the use of electric cars in Europe, wants to move to



electric-only vehicles by 2025, as does the Netherlands. Both Germany and India have proposed similar measures with a target of 2030.

8. Oslo Green Gardermoen

In Oslo, architects are aiming to make buildings more environmentally friendly. At first glance, it looks like a major challenge. After all, mass transportation and habitat nodes consume lots of energy. Yet, a combination of engineering smarts and response to nature



can go a long way. The architects relied on a holistic approach to minimize the carbon footprint. The walls and windows of new era buildups aim to make maximum use of daylight, quite a challenge in the environment and mindset where walls add to mental satisfaction. Natural materials such as locally sourced stone and wood from sustainably managed forests are being used throughout these buildings. It is time to highlight those elements that can give inhabitants a sense of place, a

sense that they are in a particular location, with its own local identity. Discarded construction materials are not classified as 'general waste.' It is sorted and handled separately as new buildings have more creative fits to use them differently and not dump them. The new design is a testament to its efficient use of the space. Buses and vehicles will also switch to renewable fuels or electricity if more e-fuel and bio diesel stations are set up.

9. Delhi Airport

Terminal 3 at Delhi's Indira Gandhi Airport is going green too. Energy and water is conserved by maximizing natural light, harvesting rainfall, installing an on-site solar power plant and sewage treatment plant and having an integrated building management system to optimize operations too. The significant financial and human health benefits associated with greening these city spaces. While we wait the era of electric cars, right now it seems that the key to greener cities isn't in a single game-changing innovation, but in the accumulation of small positive changes around the world.



10. Japan Fujisawa

In Japan's Fujisawa Sustainable Smart Town, located at 50 km west of Tokyo, 18 companies



have collaborated in a 344 million dollar project. This site includes residences, parks and commercial facilities and is also powered by solar panels, with energy distributions via a localized grid. It will complete in 2018 with 1,000 households, as a part of 100 year sustainability. In Japan, the line between nature and the built environment is a blurred

one and the architects are using this to create innovative and cutting-edge designs. While the designs are forward-looking, they have their origins in a tradition deeply rooted in Japanese culture, where architectural practice has always been to work in harmony with the natural surroundings. Buildings are built around trees, in trees and as trees. This philosophy has always been there. A clue can be found in the Japanese writing system. Put together the pictogram for 'house', and the pictogram for 'garden', and there is word for 'home'. The space inside and outside the building is continuous. The source of this approach is, in many ways, a result of Japan's mountainous landscape and exposure to weather events, and encountering nature to forefront of daily life. As such, the country has limited spaces for living, with most of the population on the coast. People's relationship to nature is very immediate. People are very crammed in. In some cases, traditional rural buildings can be opened entirely to the surroundings. Japanese buildings often don't have doors. When the weather is very hot, especially in poorer communities in Japan, they would just open up the entire building. Nature flows through the living space. In contemporary Japan, over 90% of In contemporary Japan, over 90% of the population lives in urban areas. But even in the country's dense, futuristic concrete jungles the relationship to nature exists. Japanese urban living is quite tight and condensed. Yet within these very tight plots you get extraordinary open situations





almost as if there's no container, or containment, at all. New designs include cloud-like structures, like the futuristic Serpentine Pavilion in London, and a glasstransparent house in Tokyo inspired by the life of a tree. Architectures like Mikimoto Ginza, Tod's Omotesando and Sendai Mediatheque incorporate tree-like elements, and light falls into the buildings like it would a forest. The relationship between nature and buildings is also about

survival. Buildings can be very lightweight, raised above the ground and flexible to twist and

absorb the shock of an earthquake. Ito's acclaimed Sendai Mediatheque building, in Miyagi, survived the devastating quake of March 2011, in part because of the innovative use of tree-like flexible supporting tubes within the building. Tadao Ando architectures are highly regarded in modern Japanese architecture for its concrete, sculptural buildings that focus on the flow of natural light. These works, despite using concrete, reflects that same fizzling of



nature and building. Nature is also caves and spaces within the land. Japan's culture of resilience is built into its architectural practice, and its ideas about openness translate to even the most modern forms of urban living. In Japanese thinking there is no built or natural environment, just nature.



Rising sustainability concerns over the last decade have brought about a fascinating new tendency in landscape concepts for development and renewal of urban and even industrial areas. Nature is coming back to cities and that's a wonderful opportunity for us to get back to it too. Recreation areas, consists of parks and public spaces to relax, walk through, and enjoy lunch breaks, are becoming a retreat to more or less cultivated scenery of gardens, pathways, and beaches to recover and recharge before city life sucks us back again in its ever-circulating flow. Beyond the Romantics of the pictures these models are thinning the line between city and nature, public and

private, production and recreation. In the last few decades have architects, urban and landscape planners started to question the outdated dichotomy of city-nature and to conceive them as components in a wider system along with sociological, cultural, and

environmental processes which constitute the reality of a place. It also force to rethink and redraw some of the basic paradigms that define what makes a space a park, a square or a house. This collection of projects shows that parks of the future can be something more than city oases and recreation arenas. could powerful They be environmental vessels that can influence the natural qualities of their environments and develop not in spite of, but along with, the city



and its inhabitants. It also serve to regenerate a territory which over the course of time has been exhausted and become dysfunctional, lending it new meaning in the urban fabric.



And still there are those trying to imbue the landscape with memories and the cultural and historical heritage of spaces, which all contribute to what we perceive as 'the spirit of a place' and what actually make us remember it, love it, go back to it and thus, keep it alive. Developers are always afraid from the extra cost that would go into a construction and lesser their profits. Or, buyers would turn away citing the high cost. But the tide is turning. Newage developers are keen on making a point on still earning profit while doing

something making a mark, to stay proud of, making kids and next generation proud of and that the world likes.

OBSERVATION: SMART CITY

Smart cities will use internet-connected sensors to supply information that will make them more efficient. Dr. Sam Musa defines the smart city as one that engages its citizens and connects with its infrastructure electronically, a process whereby the city becomes part of the Internet of Things or IoT. Most of the efforts to develop smart cities have involved the monitoring of transportation networks and power and water supplies, with other projects looking at waste management, crime, educational establishments, and hospitals. Stated aims are to reduce costs and resource consumption, with many cities interested in improving communications between officials, service providers, and citizens. There is much excitement over the possibility of cities monitoring activity in real time and being able to adjust service provision, in some cases immediately by remote-control. The hope is that the smart city will be able to adapt more effectively to climate perturbations, demographic changes and the budgetary cuts being made in most developed countries. Bill Gates was planning to build a smart city from scratch in Arizona and that the global market for smart cities will be more than a trillion dollars per annum by 2022. Many cities have initiated programs and projects. The European Union has smart city projects under the auspices of the European Digital Agenda, and there are similar initiatives in cities in North America, Asia, and the Middle East. According to Boyd Cohen, an urban and climate strategist working in the area of sustainable development and smart cities, the top ten smart cities are Vienna, Toronto, Paris, New York, London, Tokyo, Berlin, Copenhagen, Hong Kong, and Barcelona. In North America, Boston, San Francisco, Seattle, and Vancouver are said to be leading the way.

1. Vienna

Since 2011, Vienna has been setting ambitious targets for the management and consumption of energy, with a strong emphasis on reducing greenhouse gas emissions. Toronto is working with a Google company to create a community in the eastern waterfront that will use connected technology to provide selfdriving vehicles and 'climate-friendly energy systems'.



2. Toronto

In Toronto the smart city agenda has a strong green emphasis regarding reducing the



production of carbon dioxide, through the operation of smart electricity supply grids, increasing efficiency and harnessing low-carbon energy supplies. Not only that it uses nature and natural element, together with advanced technology, it creates a smart environment too. Smart city thinking puts less pressure on nature and thus tends to protect it in terms of soil, water, habitats and species.

3. Paris

In 2014, the 'Innovation Path of Paris' was launched. This puts people at the heart of the initiative. It is looking for modernization of the administration for better services and places great importance on ingenuity. Themes include better planning and transportation and more efficient resource consumption. Under the Ingenuity heading, resilience, re-vegetation and the circular economy get a mention. The authorities in Paris have recently attracted attention for their initiatives to promote urban greening, including the green roof law that turned out not to be a law but a trend.



4. New York City



There has been much excitement over talking lamp posts. Street lamps send messages to smart phones. There is a serious aspect to this, ubiquitous street lamps, with their access to power, could become a useful way of bringing about a range of smart city projects. Leaping from

the 'green walls' in Vienna, the next step with this research will be to place temperature and humidity sensors and thermal cameras across whole precincts.

5. London

The British capital city has a congestioncharging system which uses vehicle license plate recognition software. Police in the United Kingdom use the same technology to operate a nation-wide vehicle tracking system. Underway are developing the sensors and software for the smart city, working with Urban Systems Engineers at Imperial College and other institutions, the city is looking for new opportunities to tackle urban problems. This city uses



algorithms that allow computers to recognize things around the neighborhood. Importance is increasing to protect the biodiversity of urban landscape. They are speeding up the



identification, mapping, and analysis of all kinds of objects, living and inert, static, and moving.

6. Tokyo

Japan, which will host the Olympic Games in 2020, has put energy security and efficiency and showcasing technology as the key objectives of its smart city program as the relocation of utilities below ground to allow more space for advertising, emergency information, hotspots and power outlets for pop-up businesses.

7. Berlin

To the Germans the smart city as an interdisciplinary process which uses information and communication technologies to make the city more efficient, healthier, more sustainable, more livable and cleaner. Berlin's smart city strategy is comprehensive and refers to the need to maintain green space and unsealed surfaces and evaporation, as required by its urban climate plan that will pave path for biodiversity in the smart city strategy.

8. Copenhagen

This city is keen to understand how the microclimates of whole neighborhoods change through each day. Researchers are trying to get readings through the different seasons and extreme weather events. The immediate effect of the climate change is a single season stretching all over the year and overlapping of the prime seasons throughout the year. And of course the summer is extreme hot and winter has



sudden sub-zero chilly pockets. Copenhagen is building houses suited to that fluctuation.

9. Hong Kong



This autonomous entity pioneered the use of radio frequency identification or RFID chips in smart cards. Hong Kong citizens access public transport and pay at convenience stores and fast-food restaurants with their Octopus smart cards, which were launched in 1997. Hong Kong also pioneered the use of smart cards for use in libraries, buildings, car parks and other facilities. The technology has spread to other cities in China and across the world.

10. Barcelona

We know that water, soil and vegetation modify urban microclimates. They have shown how shade and evapotranspiration provide summer cooling and winter wind-shielding. This city uses that on its benefit. Researchers are placing sensors beneath and upon green roofs and green walls to understand how buildings are protected from the extremes of weather. And the other cities are catching up soon. What more could be done? There are scores of things and portals.

The measurement of rainwater flows through downpipes, into tanks, and drains can also be

added to the capability of making the city greener. City planners will be able to identify places where green infrastructure is urgently needed to improve microclimate and drainage, and the information will allow architects and urban designers and those planning, design and operating buildings and streets to be more sophisticated. Software that can monitor weather forecasts and remotely empty rainwater tanks in advance of downpours in order to avert flooding already exists. Such systems could become city-wide, not only reducing flood risk,



but also boosting irrigation rates of roof gardens and other irrigated plantings in advance of



heat waves. Global positioning system (GPS) follow vehicles and equipment like cell phones, but these techniques are also being used by biologists to follow free-ranging and migratory animals. Although there are policies that promote the creation city-wide ecological networks, GPS could be applied to the study of the movement of wildlife through cities, helping planners to identify barriers to movement and where best to create new habitat. This is less intrusive than tags are cameras including camera-traps and listening devices. The ultrasonic calls that bats make, for example, enable us to identify species and to plot the places where bats feed and the routes that bats take when they commute between roosting and feeding sites. Permanently stationed bat detectors can automatically monitor and map calls in real time. This is already being done

by University College London in the Queen Elizabeth Olympic Park, London, for example. It is easy to imagine such a scheme being expanded to cover a whole city, so that habitat networks for bats could be monitored and improved. As well as bats, many other species can be identified by sounds, from insects to birds, to whole ecosystems, so that natural soundscapes could be brought into the city, in a way that will help us to green the city in a more



effective and informed way. Machine learning will mean that the identification and mapping of habitats, species and green infrastructure types using aerial photography, cameras and cameratraps with both visible and invisible wavelengths can be expanded and refined.

CityTree

Pollution is one of the world's invisible killers. It causes seven million premature deaths a year, making it the largest single environmental health risk, according to the World Health Organization. In urban areas, air quality is particularly problematic. More than 80% of people living in areas where pollution is monitored are exposed to air quality levels



that exceed WHO limits. In 2017 World Bank said it had become the 'deadliest form of pollution' and was now the fourth leading risk factor for premature deaths. In 2013, these deaths cost the global economy around \$225 billion in 'lost labor'. Already, 50 percent of the world's population is living in cities. And given that by 2050 two thirds of the global population will be urban,

cleaning up our cities' air is a matter of urgency. One well-established way to reduce air pollutants is to plant trees, as their leaves catch and absorb harmful particulates. But planting new trees is not always a viable option due to lack of space and rarely available soil in asphalt and concrete covered city. That's why the CityTree, a mobile installation which

removes pollutants from the air, has been popping up in cities around the world, including Oslo, Paris, Brussels and Hong Kong. But this tree in the city is not a tree at all. It is a moss culture. Each CityTree is just under 4 meters tall, nearly 3 meters wide and 2.19 meters deep, comes with or without a bench. A display is included for information or advertising. This invention has the environmental benefit of up to 275 actual trees. Moss cultures have a much larger leaf surface area than



any other plant. That means it capture more pollutants. The huge surfaces of moss installed in each tree can remove dust, nitrogen dioxide and ozone gases from the air. The installation is autonomous and requires very little maintenance. In-build solar panels provide electricity, while rainwater is collected into a reservoir and then pumped into the soil. To monitor the health of the moss, the CityTree has sensors which measure soil humidity, temperature and water quality. The pollution sensors inside the installation help monitor the local air quality. Tiny tufts of leafy greens, stuck to tree trunks, rocks and possibly old building walls. Unlike plants with roots, moss can absorb all its nutrient needs directly from air, an adaptation that allows it to 'eat up' air pollutants that cling to its sticky surface. Its



creators say that each CityTree is able to absorb around 250 grams of particulate matter a day making it 90 kilograms per year and contributes to the capture of greenhouse gases by removing 240 metric tons of CO2 a year. The plant-based air filter also cools the surrounding air by water evaporation (up to 17 degrees Celsius within a five-metre radius) and is thus a space-saving way of combating urban heat islands. CityTree is meant to add greenery to congested concrete-heavy spaces but requires 99% less space to do so. The moss species being used are Ceratodon purpureus and Racomitrium canescens.

European countries have been required to check environmental air quality and measure any airborne pollutants that could endanger human health since 1996. Yet for many governmental and scientific institutions, meeting these targets with traditional air-sampling methods has been a challenge, with equipment that can be difficult to calibrate and sometimes prone to breakdown. Creating and testing a method for controlling the air

quality based on a new biotechnological tool. Use of a devitalized moss clone as passive contaminant sensor The European Union funded research project MOSSCLONE is developing a radical alternative existing air-sampling to methods, one that is easy and cheap to implement the use of moss. Mosses have been used for decades to monitor air



quality. They lack a root system, so they rely on deposition from the atmosphere for their mineral nutrition. They are especially well-suited for air-quality assessment as they are very effective at trapping pollutants, both particulate and gaseous, even after its devastation. It is tested in three European regions, each in a different climate zone to identify potential air-pollution risks, whether they are to human health, agricultural crops, natural ecosystems or more. They are Galicia in the north-west of Spain, Campania in the south of Italy and Austria.

CityTree is just one piece of a larger puzzle. This sustainable urban design focuses on new ways to tackle environmental problems in cities. Cities in lower-income countries such as



India, which tend to have elevated levels of pollutants. So far, around 20 CityTrees have been successfully installed. For the last few days, the dense smog enveloping New Delhi has halted traffic on highways, forced schools to shut down and sent worried residents scurrying to buy air purifiers and masks. With the deadly level of carcinogenic pollutants in this toxic haze being roughly 10 times the reading in

Beijing, Delhi can try a few CityTree too. For instance, a 100 meters long moss wall is being built in Stuttgart, Germany's worst city for smog. In spite of roughly 438,000 trees line the city's streets, Berlin embraced it too. With India being much in news for its deteriorating levels of air quality, Green City Solutions is hopeful about introducing CityTrees in the country's highly polluted urban agglomerations. This effective eco-friendly innovation may just what Indian cities need in their uphill battle against pollution.

Hedges

Hedges are often better than trees at soaking up air pollution among tall buildings, research has suggested. Atmospheric Environment journal says tall trees are good at absorbing pollution in more open areas. But hedges can trap toxins at exhaust pipe level, so reduce

people's direct exposure to harmful pollutants. The emissions from vehicles starts to dilute very quickly as you move away from the road - so any hedge that acts as a barrier slowing down the airflow and catching pollutants on the leaves is going to offer people in homes better protection. Low hedges between pedestrians and the street can be planted if pavements are wide enough.



Researchers in EU and US are looking for the best pollution-busting plants, and the optimum height for the hedge. Any gardener in a major city who has trimmed a privet hedge, for instance, will attest that it is full of dust and pollutants that the tight-knit foliage has filtered from the air. Trees help clean the air and many more should be planted as people worldwide flood into cities. But the role of the hedge has been neglected, especially in city 'canyons' where tall trees can in some circumstances trap pollution at street level. The neighborhood may suffer if people remove their hedges.

Vertical Farm

The Vertical farm, founded in 2013, by start-up farm 'Plenty', has an indoor growing system that uses less space and water than traditional farms. Its layer on layer of soil on stands rose as a multistory cultivation unit. And it has raised more than \$226m since its start. It



distributes the grown foods locally. Some might say that locally grown food tastes better, since it doesn't need to survive weeks of transport. Plenty's growing system, kind of like a living wall, and control over the environment, allows for water to be recycled easily. It also makes growing crops more efficient. The makers say it can produce up to 350 times more per square foot than traditional farms. The firm is planning indoor farms on land of two to five acres, roughly the size of

Home Depots or Walmarts. Competitively priced, thanks in part to a shorter supply chain, the vegetables are within reach of a range of incomes.

In conclusion, it seems that smart cities are coming. However, it is important that smart cities are as much about nature, health, and wellbeing as traffic flows, crime detection, and

evermore efficient provision of utilities. Making the city more permeable to both wildlife and people is a process that could be informed by bringing sensors that monitor the movement of wildlife. Climate change adaptation using natural interventions is already on the agenda of many cities. However, the efficacy of infrastructure types green and combinations in providing cooling and absorbing rainwater will be significantly improved through both detailed and wide-



scale real-time measurement of temperature, humidity, evapotranspiration rate and flows. Combining this data with maps of hardship and deficiency will help cities to become smarter in the way they prioritizes greening efforts.

OBSERVATION: NATURE ARCHITECTURE

As more of us flock to urban living, city designers are re-thinking buildings' influence on our moods in an era of Nature-architecture. "We shape our buildings and afterwards our buildings shape us," mused Winston Churchill in 1943 while considering the repair of the bomb-ravaged House of Commons. More than 70 years on, he would doubtless be pleased to learn that neuroscientists and psychologists have found plenty of evidence to back him



up. The findings are that the buildings and cities can affect our mood and wellbeing, and that specialized cells in the hippocampal region of our brains are attuned to the geometry and arrangement of the spaces we inhabit. Yet urban architects have often paid scant attention to the potential cognitive effects of their creations on a city's inhabitants. The imperative to design something unique and individual tends to override considerations of how it might shape the behaviors of those

who will live with it. There are some really good evidence-based guidelines out there on how to design user-friendly buildings. A lot of architects have been ignoring them. Now architects, designers, engineers, neuroscientists and psychologists, increasingly cross paths at an academic level, but still rarely in practice.

Housing projects of old era, puts a sense of isolation from the wider community and ill-conceived public spaces, made many of them feel, as if designed for its inhabitants not to succeed. It was argued that Pruitt-Igoe housing complex in St Louis, Missouri, with the wide open spaces between the blocks of modernist high-rises discouraged a sense of community, particularly as crime rates started to rise. They were eventually demolished in 1972.Today, thanks to



psychological studies, we have a much better idea of the kind of urban environments that people like or find stimulating.

Colin Ellard, researcher in the University of Waterloo says, "Your physiological state is the one that impacts your health." Taking a closer look at these physiological states could shed



light on how city design affects our bodies. One of Ellard's most consistent findings is that people are strongly affected by building facades. If the facade is complex and interesting, it affects people in a positive way and negatively if it is simple and monotonous. People try and hurry out of the dead zone. Mind pick up considerably when they reached a stretch of built environment, where they reported feeling a lot more lively and engaged. Writer and urban specialist Charles Montgomery, who collaborated in the Manhattan study, in his book Happy City, warns, "As suburban retailers begin to colonize central cities, block after block of brica-brac and mom-and-pop-scale buildings and shops are being replaced by blank, cold spaces that effectively bleach street edges of conviviality." Vancouver, which surveys consistently rate as one of the most popular cities to live in, has downtown building policies geared

towards ensuring that residents have a decent view of the mountains, forest and ocean to the north and west. As well as being restorative, green space appears to improve health. A study of the population of England in 2008 found that the health effects of inequality, which tends to increase the risk of circulatory disease among those lower down the socioeconomic scale, are far less pronounced in greener areas. Another oft-replicated finding is that having access to green space such as woodland or a park can offset some of the stress of city living. Theory is that the visual complexity of natural environments acts as a kind of mental balm. In 2013 a virtual reality experiment in Iceland in which participants viewed various residential street scenes and found the ones, with the most architectural variation, the most mentally engaging. Another virtual reality study, concluded that most people feel better in rooms with



curved edges and rounded contours than in sharp-edged rectangular rooms. The importance of urban design goes far beyond feel-good aesthetics. A number of studies have shown that growing up in a city doubles the chances of someone developing schizophrenia,

and increases the risk for other mental disorders such as depression and chronic anxiety.



The main trigger appears to be what researchers call 'social stresses', the lack of social bonding and cohesion in neighborhoods. Andreas Meyer-Lindenberg at the University of Heidelberg has shown that urban living can change brain biology in some people, resulting in reduced gray matter in the right dosolateral prefrontal cortex and the perigenual

anterior cingulate cortex, two areas where changes have previously been linked to early-life stressful experiences.

Meaningful nature interactions that are crucial for mental health do not come easily in cities. Social isolation is now recognized by urban authorities as a major risk factor for many illnesses. Is it possible to design against it, to build in a way that encourages connection? of the first One to try was the sociologist William Whyte, who advised urban planners to arrange objects and artefacts in





public spaces in ways that nudged people physically closer together and made it more likely they would talk to each other, a process he called 'triangulation'. In 1975, the Project for Public Spaces, founded by one of Whyte's colleagues, transformed the way people used the Rockefeller Center in New York City by placing benches alongside the yew trees in its basement concourse instead of the peoplerepelling spikes the management had originally

wanted. A similar principle was followed in Times Square, introducing long sculpted granite benches to emphasize that the iconic space, once clogged with cars, is now a haven for pedestrians. Enriching public spaces with green will not banish loneliness from cities, but it could help by making residents feel more engaged and comfortable with their surroundings. Living among millions of strangers is a very unnatural state of affairs for a human being. One of the jobs of a city is to accommodate that problem. How to build a society where people treat each other kindly in that kind of setting? The answer is, that is more likely to

happen when people feel good. If they feel positive they are more likely to speak to a stranger.

One thing that is guaranteed to make people feel negative about living in a city is a constant sense of being lost or disorientated. Some cities are easier to navigate than others. New York's grid-like street pattern makes it relatively straightforward, whereas London, with its hotchpotch of neighborhoods all orientated differently and the Thames meandering through the middle is notoriously confusing. <u>Kate Jeffery</u>, a behavioral neuroscientist at University College London who studies navigation in rats and other animals, made the point that to feel connected to a place people need to know how things relate to each other spatially. In other words, they need a sense of direction. Places with rotational symmetry, which look the same whichever direction, they are looked at from, are a nightmare for orientation.



A sense of direction is equally important inside buildings. Navigation, in going from A to B via one route and taking a different route to return, really confuses people. They leave such buildings as soon as they could figure out how to get out, as those gives an anxiety attack. Green in the city, forms a 'desire-lines' that wend their way across grassy curbs and parks



marking people's preferred paths across the city. They represent a kind of mass rebellion against the prescribed routes of architects and planners. Green in the city, form a 'Distributed Consciousness' which is a shared knowledge of where others have been and where they might go in the future. It is also about imaginations how it might

affect our behavior if desire lines of 'social trails' be generated digitally on pavements and streets. The scientists agree on that successful design is not so much about how our buildings can shape us, as Churchill had it, but about making people feel they have some control over their environment. For people are creatures of the places they live in.

OBSERVATION: RESISTANCE AND EMBRACING

Industrial cities have always seemed a sort of environmental hell, the source of pollution and habitat destruction and the forces that drive them. And yet there could be found some of the good. The very phrase "urban nature" seems paradoxical. Common thought is that

the 'nature' as something opposed to 'civilization', a green world of diverse lifeforms and complex ecological relations set apart from the gray world of human artifice, edifice, labor, and domestication. Nature is antithetical to this built environment, and wilderness- where "the earth and its community of life are untrammeled by man. Where man himself



is a visitor who does not remain," Wilderness is the most natural nature of all. The necessary qualifier 'urban' confirms that remoteness from cities is the norm, the standard field mark, the distinctive feature of Nature as reality and idea. It takes a leap of imagination, or faith, to think of nature and cities in the same mental frame. And yet this difficulty, this resistance to the very idea, suggests both an avenue of critique and an opportunity for learning. Most people have little reason to pay close attention to local



nature. Consider the matter of where food comes from. Residing in a place and using articles and consuming foods grown and processed elsewhere makes people care a little of the place he is in. Such is not the case, of course, with indigenous people who depend on the local landscape, either as huntergatherers or as agriculturists that could be seen while wandering in the North

Eastern states and many other places in India, have shown how close ecological dependence fosters intimate, personal relations among resident organisms and a spiritual sense of relatedness that is deeply embedded in local culture. In contrast to such 'personal ecology,' the urban life rests on an impersonal ecology that has removed the greatest incentive our species has ever had to pay close attention to the green world.

But there are other, more psychological reasons why urban nature remains largely invisible to us. For one thing, we don't have convenient ethical or esthetic categories for interpreting city landscapes. Take the green patches between the house which begins as an unkempt lawn and culminates in a belt of few woods. It's hardly sublime. There are no soaring

mountains or plunging chasms. Nor is it picturesque. It's too thickly grown, too narrow in scope, with no glimmering lake or pond in the middle ground, no grazing cattle. It could not be called a garden even for no one tends it, the plants and animals grow wild, there's no plan or esthetic in their arrangement. It is far from both art and husbandry. Nor does it qualify as wilderness as it is too small to meet the legal definitions. What we have here is a mixed, ambiguous, and confusing landscape yet one that is full of life and his



landscape, yet one that is full of life and biotic diversity. Why not to study nature in such a landscape the way people are drawn to study it in the mountains, the desert, or the sea?



The same chlorophyll, after all, makes the green world green no matter where it grows. Part of the reason may lie in what Leo Marx calls "pastoral idealism," the deeply-embedded notion that "out there," apart from human society and its built environment, nature abounds in health, grace, and virtue. This notion, conceived by Greek poets and practiced by writers, artists, and idle aristocrats down through the centuries, lies at the root of much current environmental thought. It conveniently masks the consequences of an impersonal ecology while allowing people to revere nature at a distance. People dream of retiring in such a virtuous place Nature can provide or even dreams of going vacation in a

place of pure natural bliss, while carrying on with their regular day to day business and dodging with wretched mundane life. As long as we have shrines like Simla or Darjeeling or khandala or even Kerala backwaters glowing on the horizon of desire, we can trash Delhi, Mumbai, Kolkata or Chennai, with lighter hearts. So why not devote a slice of stolen vacation into these patches of green just outside the door.

Still urban landscapes serve as a constant reminder. A walk past the unmowed lot tells how severely humans have mauled the local ecology, driving away the animals, tearing up the ground. Once started down this path, it's hard to stop, hard not to think of the extermination of the bees and sparrows. With the decimation of prairie flora, the shaving

and burning of ancient forests, the landscape that remains begins to look like a world of wounds, and its history begins to look like a pattern of war, enslavement, and genocide, where all creatures are reduced to means for human ends regardless of their own ultimate concerns. This urban land is somehow less natural because it has been impacted or spoiled. Maybe it's



not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk. It doesn't count. It is not worth dealing with. Such thinking makes urban nature invisible. Beneath the feet and the thought lies the old desire to escape from history and avoid responsibility for our sins.

The first step is in learning and how we are affecting it. A look at the urban nature from point of view of an alien would be helpful. In ecological terms, an alien is a species that arrived from somewhere else, that did not co-evolve with other resident organisms. An



alien species does not belong in the native ecosystem, either because it has no original niche or because the niche it occupies did not exist until it arrived. Such species bad are because they 'invade'

and 'take over' by 'outcompeting' native species and 'displacing' them from their niches or habitats. Alien species are also bad because they 'degrade' the original ecosystem by terraforming it suited to their species. Think of the aliens in the comic books and sci-fi fictions. They are from another planet of even galaxy. They invade, run amok and try to take over. Aliens possess intelligence and technology, far superior and light years ahead of us. This alone makes the invasion more threatening and inevitable that the human race will but obliterated. They make human tools, once thought to be the best intelligence can produce, look so primitive and fragile and useless. It is certain that an alien invasion means that the humans will no longer be on the top of the food chain. They will be haunted down and

killed and made extinct. And if they somehow manage to live, the earth they will inherit will be thrown back to Stone Age. How these aliens look like? They seem to have exoskeleton of the most disgusting roaches, claws of most ugly rodents and as slimy as the sewerage pests. They are hideous combinations of insects and parasites. The fact is that these fictional aliens are constructed piece



by piece from the creatures, humans loath or despise. Then the plot turns into a heroic effort, human or superhuman, to defeat and annihilate the invaders in order to save the world. They must be stopped at all costs.

Now why this plot of superior intelligence? Why most grotesque look? Why the victory of the resistance? These aliens are us. They start doing to us, what we have been doing to other lesser-intelligent species for centuries. By far off brainpower, we have been putting



others to oblivion all these years. We still do it might and hierarchy, nature have bestowed upon us. It's a gift and we have not achieved the higher deck all by ourselves. The alien reflects our own behaviors, stripped of all the pretence and grace and virtue. They are a caricature of us as how we must appear to other species. Of course, it is horrifying to be confronted with a

capacity for violence or evil, greater to us. But it is equally horrifying to think that nature might not be committed to keeping us on top forever, might in fact have other ideas in mind, and might want to sweep us off the stage in order to make room for new experiments. That the old order 'changeth, yielding place to new', is a classic lesson of evolution. This thought we cannot bear to entertain. As author Annie Dillard says, "Evolution loves death more than it loves you or me." As a product of nature, the invading alien embodies all the threatening power and creativity of an evolution indifferent to

human desire. Defeating the aliens in the movie of fiction is but the ego-satisfaction of human race. It asserts human virtue as well as dominance. They defeat nature itself. But in

reality that's not going to happen. For it is the aliens, nature chose to be far more intelligent and superior species, over the humans. So, humans have to fall back. Nature, as the form of evoluted species, has to win. That's Nature's order. And if it is arguably taken in one out of infinite numerical chance that humans win, that too is a defeat. For the defeat of the aliens infers that the order of the nature is reverse and has fallen apart.



There is something wrong. And soon the species lesser to human intelligence will become victorious against their masters. It's time for the humans to be perished in the hands of



their oppressed subjects. Its one way traffic all along. In a twisted perspective, humans, the real invaders to other species, looks down upon them as ecological aliens and how pervasively they want to mow down the advance of nature, to bring order and uniformity to the wilderness. Man never likes the diversity in nature and considers them to be inferiors. They badmouth them and belittle them and come down upon it with anger and hostility and extirpate

them. The elements of nature are a plague to human eye. If left to their devices, the humans like aliens would annihilate everything else.

Humans are resisting Nature. It is time he has to resist this nature of his of playing superior

by doing away with the Nature. Instead it has to embrace Nature and learn from it. After reading nature historically as Indian environmentalism and its prophetic texts have drawn their inspiration from the saints and sages revering the wild as they stay, worship and spend life into the wild, a glance on the receding green is needed. A closer look suggests that backyard is a



flourishing array of species. What this landscape presents is a prosperous hybrid community in which human activity plays a conspicuous role. Urban nature reminds us that behind much ecological, political, and literary thinking lies a cherished concept of Edenic wilderness, a biotic community in equilibrium, sustainable, harmonious, and stable. Even though such a community might suffer occasional assaults from storm or fire, evolutionary time has guaranteed that all such disruptions will eventually be smoothed out. All resident organisms are considered to have fully co-adapted, all niches are filled. This sort of thinking posits wilderness as a base datum of ecological normality, exemplifying what the land could and would produce if left to its own devices. The ecosystem is construed to embody a set of sustainable relationships that have proven survival value and can therefore be used as a



standard of value for judging human actions and relationships, in other words, as the basis of an environmental ethic.

Significantly, model this casts human activity in a mostly negative light, as usurping, spoiling, tampering with, upsetting, or otherwise damaging the ecosystem. Such actions are assumed to arise from ignorance,

folly, greed, pride, or appetite. Humans, to paraphrase Dickens, are 'naturally vicious.' There is no room here for husbandry, responsible or otherwise. Nor is there room for the possibility that human actions might actually enhance the productivity of natural systems. What difference is there, except in degree, between ethnic cleansing and pulling weeds? Humans have to appreciate the great demonstration of the inexhaustible creativity of nature. How wonderful to find, in the city whose landscapes is dull and full of despair, a scene of instruction as rich and fertile as any wilderness. There is so much to learn from the tiny grass bloom at the feet as from the orchids high in the ranges of Meghalaya.

OBSERVATION: MY CITY

The cities round the world is going green and smart and in collaboration with nature. They all are growing at the outskirts of the ever expanding metropolis. So is the case with my city. As the huge influx of people is city-bound and as the green patches between the urban and sub-urban and ex-urban are disappearing, they change their form and foliage to adapt the city. Nature is now more city dwellers itself. As by now the developers and architects do comprehend that without the touch of nature their creation is less of worth, be it in terms

of attracting the buyers or imparting long term health benefits to the dwellers or posing an eye candy and charming faced amidst sad surrounding, they are going for smart green nature architectures. There are using the city compatible forms of nature and natural elements to make a blissful abode.

In city if Kolkata, these clusters are blooming at the Eastern part of Newtown, Rajarhat and Sapurji. Earlier they were mulling the land to build skyscrapers. Then in secondary phase the

residential complexes expanded on a comparative larger land under pretention of offering a nature living. Then as this effort seems to have falling sort, the architects are allowing the green crawl up the concrete. More of these are seen in the towns off the capital city. Take the Industrial belt of Durgapur, Foothills of Siliguri, and Cultural cocoon of Santiniketan or sea-washed Sundarbans. These apartments and villas are inside out build-ups of international standards. The architectures not hinder but



encourage a two way flow of emotions between man and nature. They spur up as abodes from beneath the ground retaining the natural environment and the ecosystem of the area. The effort is to provide a comprehensive, inclusive, wholesome nature-living. And not to miss the point from the very beginning that it's the people, living in the city dwellings,



which are at the pivoting point of the builders to make the home of future.

The 300 year plus city is younger to the Danish colony of Srerampore, French colonial town of Chandannagar, Portuguese colony of Bandel, Dutch colony of Chinsura among other British colonies in the districts of North and South 24 Paragana, Howrah. Yet this younger city is too tidy to expand. The southern part of the city is more congested compared to the north which was old and actual vicinity from where the village of Kolkata spread as a city to the rest of the metropolis we see today. It went through Calcutta in early British rule and was been the capital of India till 1911 before taking up the colloquial

term of Kolkata in 2000. Thus the north Kolkata is crawled with colonial and Art Deco buildings with the network of tiny allies.

In South, the green finds comparatively more breathing space. And in far North, the lack of green has been compensated with planted trees by the urban developers and planners. The road dividers here are not made of concrete and widened with soil fill-ups. It's a garden in between the two way lanes. Tall trees, bushes, shrubs, creepers and grass are arranged to

sooth the eye. Gardeners have created are pieces and sculptures with tiny leaves. With water-bodies and rocks its miniature forest in the city of bustling traffic and breathless ruckus. The canals of city drainage are covered and reformed and it is incomplete if the lowlands on both sides are not covered with green.



Maidan is called the lungs of the city as it's a wide open place with grassy fields stretched for acres. The youth and adolescence of the city's Central and southern spheres dive and roll here to play, run, jog and stretch out. Adjacent is Mohorkunja (gardens of gulmohar trees) and citizens' park. Of course the Botanical Garden is in Howrah, the Eastern bank of river Ganges. These are all signs of people of a city conscious and concerned. The nature in pockets of

urban living, spreads from the hub of protected boundaries of botanical gardens and are evident in other parts of the city too. This city harbors a jungle in its belly. And in turn this



jungle harbors birds of almost extinct in the city and lizards and amphibians and insects they lost habitats in an ever-increasing city high-rises. As per the forest department this 2000 tree Park Street enclosure is the only 'City Forest' recognized in its records. There is a reserved forest in the southern fag of this metropolis. It's called Chintamoni Kar Bird Sanctuary in Garia. The visitors are duped by the very nature of this forest. Though in plains, it shows traits of hilly

forest. The canopy it too thick to envisage any sunlight on the forest floors making it damp and wet, creating ideal conditions to grow moss. Now it's an illusion of the woods of Dooars or Nagaland. Another grand opening for the nature scope is the resting places for the departed. The graveyard of Park Street, the Scottish and Armenian Graveyard and Gobra Islamic graveyard

among others provide a tax free abode for the large plantations. These places are among those where no development would lay its mortal hand. Creeps and shrubs grow over the tombstone and whisper to the breeze and rays and raindrops unhindered. And there is this famous lake of Rabindra Sarobor



with massive and oldest trunks bordering it. It's an amazing opening for youth and old and families. Not only a playground, this is a place for People to e humbled. They talk to each other and the nature in a group discussion.

Eastern part of the city is a green spreadsheet as the rural land is being developed into housing and Office premises and IT hubs. Unlike the north and south, the Eastern portal gives ample room for the planners to lease places for nature. In the IT hub of Sector V area,



nature seems to be an integral part of the corporate office buildings. As this area is adjacent to the large water lakes used for fisheries, the office areas enjoy a wide panorama of nature and of course the large calm waterfronts with reflection of blue and cloud on them. As a working place it's most creative and productive. A workstation by the window is no less soothing than home. Thus these buildings are energy efficient too. They

boast wide windows and glass facades to intake most of the natural light, thus cutting the carbon emissions and putting effects both immediate and far-fetched on the surroundings. The Eco-Park, a combination of lakes, plants, water bodies, walkways, gardens and shades made of woods and thatches is located here.

The growth and development in Kolkata is on its facades and parks and walkways and open public arenas. And yes they are abiding by the presence of nature. The boundaries of a

housing unit take into consideration the huge trees, grown right into the heart of postmodern living. Houses are being built amidst trees and public open arenas are built around the trees. The pavements are both thorough and fragmented providing the grass to grow with their miniature ecosystem. And this is connected with the family of trees on open soil round which the stony sitting



arrangement is done. These grasses and trees are not trampled by the mob rather these are taken as one of the entities to be communicated with. The presence of nature enhances navigation both of eyes and soul. They act as catalyst of larger communication between



humans and that is in the light of a spirited living unnoticed this spread spontaneously all round the men and nature. The trees grown giant in the footpaths spreading its leafy canopy. They are a soothing assurance of connected living. Looking outside the window of a multistory

is bringing upon calmness, feel the ever-presence of a kin that watch over the growth of an

urban life. They are inseparable part of the city landscape. Somehow they continue to shape the people living here. They have deep influence on the nature and behavior of the dwellers. The branches turn and bend to find spaces in congested inter-concrete spaces. Their relation to the build surrounding is of reflecting life and vigor it has and shed



the leaves of spirit on its way forward. With the presence of these trees, no empty land is really empty. They have mossy maze, hayey hue or ferny floors, sharing place with shrubs,



succulents and creepers. They find place on a brick wall, drain pipes, attics, sun shades and other trees. They grow on and along the sidewalk. And the low lands that leads to the sewerage. They fill up empty spaces a little less tamped by men. They are on the rail tracks, corrugated rooftops, by any water-body, on the unnoticed

piece of rock in the backyard, space between home wall and guard wall, space between the

spaces. The green builders weave in modern living and the urban wilderness smile at each other and congratulate and complement each other. They grow simultaneously without distinction of genre, away from the sense of pedigree and humbleness. The intoxication is for humans alone.

How they embrace the gust of air, the flow of miniature water-bodies, the growth of shrub decor, the firmness of stones, the





waywardness of shoots, the array of leaves, playing of natural rays. There is more room for the natural elements in masonry. The virtual nature shares similar place with metal and concrete. The housing unit is taken care of, revered and smiled upon over a pleasant glance. And with time the nature round homes gathers depth. As more greenery are seen round the fringes of that polished wilderness- on the fences

by the hedges. Nature finds a way. Indeed they are interwoven in the city landscape.

The streaming populace in cities still has their roots in rural soil. They smell the natural growth more from amidst the busy running life, enchanting visuals and extreme cacophony. Just like the Red Indian walking with a white man and exuberated to hear a cricket. While

the white man asked how he can identify a cricket among all sorts of deafening sounds, the Indian tossed a dime on the walkway and six people turned their heads. Then he explained that if there were scores of noises how would these men listen a nickel? Because, we can listen, what we think of. Those people were brooding over monitory elements and he, a rustic,



rural, uncivilized, tramp, fool was all thinking of nature. So in my city, along with the learned, science-minded, advanced, concerned and environment-aware elites, the new entries from rural eco-social walk too harbor nature in their own way and are compassionate to urban nature.



The slums in the city are not going away in close future. They are in close competition with urban nature for spaces. Yet they are not entirely wiping the green out. The shanty dwellings are too dotted with plants bearing fruits. For either a sense of self sustenance or getting relief from poverty or a protest against the core metropolitan snobbery where they can't make an entrance, the slum dwellers try to grow something or

other whereverthey find soil. So, if not that much the slums show a little kindness to greenery.

It's quite a journey for an artist to watch and incorporate the interaction between the city, its people and the nature. They advance on each other, enslave, have leverage on others,



and then understand their importance. They grow conscious of others inseparability, indispensability and contribution in their own existence. It's quite a journey for an artist to put on canvas, an abstract renderastion of the nature adapting the city life and germinate, grow, abolish and resurrect in urban scope. They display a tirade of ignorance, arrogance and mercy. It's an ebb and flow relation among them. It's quite a journey for an artist to comprehend the marinating of people, nature and the city around the world and the flow from rural lot to them making them a metropolis. How the cities flourish, how their relations with respective nature and how they grow in unison. And it's an amazing journey for an artist to see the nature grows as the city and both changes form and shape and evolve to adapt advancement of time. The human effort to make this environment a little more livable for nature too as they have done for themselves.