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Exploring Other Concepts of *Smart-Cities* within the Urbanising Indian Context

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Abstract

The idea of *smart-cities* is examined with respect to the intent, including current urbanisation models, development issues and city planning in India; the case of the proposed *smart-city* of Dholera in Gujarat, a flagship of proposals and current realities is looked at. An indigenous alternative following the model proposed by Dr. Abdul Kalam, of *smart-villages* instead is examined for appropriateness.

1. Introduction

The development of the currently celebrated *smart-cities* has been progressing for the last several years, especially in the developed countries. Since its inception, the electronic computer as a by-product of World War II, has taken on diverse forms, developing from early room-sized behemoths to tiny 'dust' particles.

Cities have become the centres of modern life, providing facilities for education, commerce and entertainment, and has become a prominent part of the global 20th century development; not that urban life did not exist earlier, or that it lacked in education or commerce. Urbanisation has been part of the process of rural-urban demographic distribution and people's migration; an increasing portion of the population has shifted from being involved in the primary sector of agriculture as livelihood, to the secondary and tertiary development with diverse opportunities in

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urban contexts; urbanisation and the socio-economic processes have moved through differing phases, from agriculture to industrialisation/manufacturing, and as currently into the information age [1, 2]. The current global urbanisation rate of 50% as in 2015 is expected to rise to about 70% by 2050; however, the process is slower in India, being at 31.3% nationally [3], and expected to rise to approximately 52% by 2050. How such realities are playing out in the country is examined.

Undoubtedly, the country lives in its villages; much of the nation is still dependent on agriculture as a primary means of livelihood. It would be appropriate to say that the process of urbanisation is mostly because of lesser options in the countryside to make a suitable living, than of a choice of a better life in the city. It is not to deny one of turning their dreams into reality; it must be understood that the possibility is exercised usually as an *ad-hoc* option.

The advent of the 20th century has also brought with it a major population increase; in part through an enhancement in the average Indian lifespan from 34 years (1911) to 68.89 years (2009 est.) [3]; the birth rate has decreased from 40 per thousand (1971) to about 20.22 (2013 est.); the infant mortality rate has decreased from 165 per thousand live births (1950-55) to 135/1000 (1973) to 37.78 currently (2015 est.); the country currently has a fertility rate of 2.37 children born/woman; hence overall, there has been an increase in the population from 255 million (1881) to 1.291 billion (2015), and a projected population of 1.657 billion by 2050 [3]; India is set to overtake China as the most populous nation by around 2028. The foremost factors contributing to the increased population over the last century can be traced to better biological immunisation, enhanced living conditions, improved nutrition, adequate health policies, modernised medical care, and such.

It is therefore not surprising that urbanisation[†] is a significant factor to contend with, not just in India, but worldwide; the rate of urbanisation however, varies by state and country. Some of the contributing factors to urbanisation are also the pursuit of better education, opportunities, or lifestyle, among others.

2. Smart-Cities

The Government of India recently declared that it is going in for development of a 100 *'smart-cities'* distributed over all states [4]. This seems to have caught the imagination of the people, both within the country and outside, in a belief that the problems and civic issues could be resolved by the planning of such smart-cities, a panacea for all urban ills which will convert cities into 21st century utopias, almost overnight! Without giving sufficient consideration or understanding to the ground realities that the country as well as cities actually are in, such announcements and public declarations seem to indicate a thinking where it is also imagined that investments in high technology will provide solutions to all problems, no matter how fundamental. It seems to be merely selling a dream to the people at large, similar to a cinematic surrealism, another escapist medium which the people of the country seems already habituated to.

Within the recent past, to better explain its intentions, the government's definition of a *smart-city* has taken several interpretations, however tentative. A current definition [5] is:
   "The Smart-City offers sustainability in terms of economic activities and employment opportunities to a wide section of its residents, regardless of their level of education, skills or income levels".

The government, as indicated above, has decided that the definition has to include socio-economic factors such as education, job creation, etc.; this also seems to have gone through revisions since. There are references to sustainability, which probably has also not been significantly explored beyond paying lip-service; the global issues

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[†] The definition of 'urban' can vary according to criteria adopted by each country, even if there are universal definitions laid out by international organisations such as the United Nations, which are not always adopted.

and causes of human induced climate change, its resolution through policy and downsizing on certain activities, especially on commitments to economic planning, could be found contrary to the objectives being espoused.

Realistically, an appropriate *smart-city* can be categorised in several ways, depending on the speaker, or the listener; in most developed countries, a smart-city is a technologically advanced setting where the space, its inhabitants and their appliances/possessions are plugged into a virtual world on an artificial reality, and on which they rely to streamline their daily lives; thus, to say that it is an complex city running in a virtual domain concurrently, might not be far from its aims.

In much of the developed world, the idea of being technologically '*smart*' would imply significant use of information and communication technologies (ICT). Going beyond the natural intelligence of the human to the development of *artificial intelligence* (AI) for computer and software-based solutions, so too from the sensorial abilities of the human, the deployment of artificial sensors and effectors would enable the extension of the human's capacity to physically influence the environmental conditions of a comprehensive space or situation. Thus, while the building is sometimes called the *'third skin'* of the human, the intent is to have effectual control of its functioning also.

Typically, in a home, by the use of sensors and actuators, the living conditions in its rooms such as lighting levels, qualities of temperature, humidity, or the sonic environment can be controlled to suit the comfort of the resident(s). The sensors identify the existing condition, and modify it to an expected condition by the use of actuators attached to the controls of lighting, air-conditioning or other mechanisms.

2.1. Some Early History of Smartness

Some of the origins of *smartness* or the then called futuristic cities were part of the popular imagination in science fiction of the 19th and early 20th centuries. Rapid advances in science and technology, numerous inventions and discoveries since the Industrial Revolution did spur the imagination that the world was in a magical era of development, for overnight transformation of the environs, as well as people's daily lives.

To be accurate, the process of urbanisation went hand-in-hand with the Industrial Revolution, especially with the trends in mechanisation, compelled the out-of-work farm labour to seek employment in towns and cities, where factories and industries were springing up. As part of this process, accompanied by droughts and famines also came migrations, travelling to further away locations or to other countries (sometimes to the colonies, like it happened to India), with those newly developed steam engines and ships.

Such fast urbanisation in the 19th century resulted in an increase in crowding, unsanitary and unhealthy conditions in these newly built industrial towns. As a disincentive to such adverse conditions, Ebenezer Howard [6] put forward the idea of 'garden-cities', which would have the best of both the city and the countryside. Since then, in the last century in the UK, some 22 new-towns based on these ideas have developed, from Letchworth (1903), to the ones around London in the mid-20th century. Later, under the powers of the New Towns Act of 1946, towns such as Milton Keynes (1967), among others sprung up. To mitigate similar conditions in the U.S., the work of social critics or theorists from Riis [7], to Jacobs [8] was influential in bringing about noteworthy changes to the conditions of poverty and ills of the then contemporary urban living conditions and in shaping the city; much of this depended on the development of planning and policy making.

Futuristic living and science fiction have always been projected in their times, even if much of it have never seen reality as envisaged. Some of the early proposals on urbanism include that of the Italian architect Antonio Sant'Elia (1888-1916) – *Città Nuova* ("New City") of 1914 [9]; some others are illustrated in the designs of Harvey Corbett in the Popular Science magazine [10]; the working models of Richard Buckminster Fuller on the Dymaxion(s) of 1930-45 [11], Wright's Mile High Illinois Sky-City Tower [12], or the work of Peter and Alison Smithson, and of Archigram (1960s) were others. Many were flights of the imagination, and most never turned into live projects.

Many contemporary architects also built science-fictionist scenarios; even today some are involved in breaking away from realities, speculating more in studies of form and/or behaviour.

2.2. Intelligent and Smart-Buildings

Realistically, buildings in the 20th century acquired and converted most technologies of speculation, research and invention into almost necessities of everyday existence. Over the years, buildings have become electrically wired, preliminarily for lighting, and then for elevators, ventilation and air-conditioning, forms of communication – telexes/paging systems, alarms and similar. Later, television/cable, fire and smoke alarms, security systems, closed circuit television (CCTV), the internet and similar services have gradually been added over the years.

During the 1980s/90s, the concept of *intelligent buildings* became popular, those wired with sensors and actuators, and which could feed back into a central console, usually located within the building, sometimes remotely; persons involved with building management or maintenance would be able to monitor and control some of these parameters, to know the location where malfunctions were occurring, or be able to remotely control factors which were outside of acceptable measures, such as security, fire-alarms or similar; though not all would be responsive, issues or problems occurring within the building could be monitored from the control locations and consoles. Some of early *intelligence* was built into machines such as elevators, fire / smoke alarm systems, electrical and standby generators, or security systems. A central console with these sensors attached could alert the building management or maintenance crew to incidence of critical issues, malfunctioning, or for scheduled or timely maintenance; these could also reflect emergency situations like fires, break-ins, flooding, earthquakes, disproportionate loading, or similar.

In differing parts of the world, *smart-buildings* have become part of everyday life (sometimes called *smart-homes*), and offer conveniences to residents like remote access, actuating the lighting, HVAC, temperature controls, TV/radio/music-system/computer or similar, besides monitoring for safety and security; routine controls also extend to daily life conveniences like heating coffee or food, warming the bath, opening the garage door, turning up/down the blinds, turning off the lighting or air-conditioning, responding to the presence or absence of a person in the room, and similar. These also have a secondary aspect that it dynamically monitors the energy use so that only the appropriate amount of energy necessary for any activity that needs to be used, at the appropriate time, and can switch itself on or off as per the instructions or convenience of the residents.

On the supply side, such buildings can also generate its own electricity from the use of solar photovoltaic (SPV) panels or wind turbines, only taking in input from the mains supply when required; and even supplying, or selling to the local grid the excess generated. For this purpose, *smart-meters* are attached to the main supply grid, and such usage (or supply) can be remotely monitored from the supplying station [13].

The future of appliances are also tied to the embedding of sensors and of actuators, as well as to the so-called 'internet of things' (IoT), where these appliances are connected and 'talk' to each other, and seemingly take decisions when certain characteristics are fulfilled; these technologies also extend to embedded and wearable computing which can dynamically monitor the health characteristics of the individual.

3. Urban Development in India

Much of the possibilities mentioned reflect the lifestyle in developed countries, maybe even of an elite associated with position or wealth in the country; however, this does not truly reflect the realities of daily life of the common wo/man in India. S/he is more plagued by electrical outages/power-cuts, crowded, delayed or dysfunctional public transportation, air pollution, insufficient water supply, non-existent drainage, the mosquito menace or the resulting health problems. In India, the growth of cities has been quite haphazard, and for the most part without the required intervention from the planning authorities.

India's growth of its urban areas is relatively recent; it can be argued that cities historically date back to the time of the Indus valley civilisation (3300-1300 BCE), the development of Fatehpur-Sikri (1567), or Jaipur (1727). However, it is changes in the last 100 years, and since gaining independence, that urban growth has occurred mostly; since then many of the cities have taken on a relatively organic pattern of growth, rather than of being planned; the partial exceptions are a few like Lutyen's Delhi (1911-1931), Koenigsberger's Bhubaneswar-Cuttack (1946), Le Corbusier's Chandigarh (1947-60), more recently Correa's involvement with CIDCO's Navi Mumbai (1971). Some measure of city planning also happened in the development of the steel-towns like Jamshedpur (1919), Rourkela (1959), and Bokaro (1964); similar planning and development has been part of the growth of Bidhannagar-Salt Lake City, Kolkata (1958-65). A current generation of planners have now taken up a more organised path to growth. For the most part, cities of India have been unplanned, frequently organic, and maybe to a certain extent also dependent on the whims of bureaucrats and public servants. A partial accomplishment is that they have been able to accommodate infrastructure for the growing need for transportation, a minimal electrical supply, water and telecommunications, however haphazard or rudimentary. Such combination of factors have led to cities being developing not just without any lasting vision, but more dependent on a bureaucrat-builder life of a so-called 'market organism'. While most development authorities were meant to spearhead the growth of cities by laying out the basic infrastructure before growth happened, such planned development has happened only sporadically, leaving most of the development to the 'market' to determine. Thus, this has also involved not just unplanned growth, but such without the required infrastructure of roads, power, water or drainage. Much of this was left for the owners to figure out on their own, or for the municipality or corporation authorities to fix, whenever they finally got to it. Thus, most development in India was the result of *post-hoc* coping with the realities of already built-up space, or even of *jugaad*. This also resulted in the inability of the municipal authorities being unable to get ahead of the growth curve. To a certain extent such arbitrariness also exposed the wings of government to be susceptible to irregularities in its decision-making; most obvious in India's cities is the lack of infrastructure for services.

What is seen is that a major driving factor of expansion is economics, particularly real estate prices and development, and hence the organic growth of cities in India are actually unplanned escalation, the control of development only being dictated by some minimal amount of floor area ratios (FAR), or elementary building byelaws, which acted as a restraining force. At some point of time, some of the highest real estate prices were in places like Beijing and Mumbai, etc. often outstripping in real terms, prices in cities in the developed world; in truth, these were unrealistic especially when looked at in terms of the *per capita* income led by increasing prices. When comparing *per capita* incomes, it would put the real estate prices of these to unrealistic levels such that only a small fraction of the population would be able to afford them, if ever. Data on cities indicate that more, disproportionate, or extreme wealth is present in these kinds of cities, and maybe in the hands of a handful and not distributed among the population as a whole. This has been shown to be true in the case of New York, USA [14], where there are more m/billionaires in that city as a whole, than in any other place in the world. It was noted that the city's major share of wealth was present in the top one percent (1%) of the city's population. Such development, and the conscious knowledge of skewed statistics, could result in the kind of protests such as the Occupy Wall Street movement, against social and economic inequality, sometimes spreading to differing parts of the world. It might be noted that only the awareness of information would or did begin to make the conscious protest against these kinds of disparities. It could be envisaged that, in the interests of democracy, especially in the case of India, developing countries or the world over, the development of smart-cities have to be looked at as a general condition, and not necessarily a special condition that pertain only to a section of the population.

4. The Case of Dholera

As part of the development in the country, the Indian government in 2001 under Prime Minister Vajpayee launched the Golden Quadrilateral highway project linking the four major metros of Delhi/NCR, Bombay/Mumbai, Calcutta/Kolkata and Madras/Chennai. As an extension to this under the Manmohan Singh government, the Delhi-Mumbai Industrial Corridor (DMIC) was proposed as a mega infrastructure project of US$ 90 billion with financial and technical aid from Japan, covering a 1,483 km. long and 300 km. wide corridor between Delhi and Mumbai; a

memorandum of understanding (MoU) was signed in December 2006 between the Government of Japan, and the Department of Industrial Policy & Promotion (DIPP), India [15].

As proposed by the McKinsey Global Institute [16], Dholera, a small village on the coastal region falling in the path of the proposed DMIC shot to prominence when it was lately proposed to be made a *smart-city*, part of a special investment region (SIR), promoted from being a special export zone (SEZ); it is to be made into the Dholera SIR. At a distance of 100 km. from the dedicated freight corridor at Vadodara/Ahmedabad, the Government of Gujarat designated Dholera as an SIR and initiated plans for its development; it also listed Dholera as part of a scheme with a greenfield port development, with nine mega-industrial zones, high-speed freight line, three seaports and six airports. Some of the included components of this development are – a port and shipyard, export-oriented industrial units/ SEZ, industrial estates, IT/ITes/biotech hubs, knowledge hubs/skill development centres, a knowledge city at Gandhinagar, a logistics hub with container freight station, a 3500 MW power plant, townships, an international airport, etc. The transportation links are connectivity of Bagodra-Bhavnagar, Dholera-Surendranagar, with interchanges, access roads for freight and passenger movement, links between Dholera, Ahmedabad and Gandhinagar for passenger and freight, and similar connections. The Dholera SIR is only one of several, part of the inner ones that is being planned; the DMIC is expected to benefit the states of Delhi, Uttar Pradesh, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra [16].

The plans for Dholera, expected to be a greenfield scheme, has already run into issues and protests from the local people, whose land was to be acquired, and where the city was to develop [17]. The reality of Dholera as it stands today, however, is very different. It is currently a constituency of 22 villages with a population of 6,532 households and 37,712 inhabitants. The indigenous population were not informed about the decisions being taken about their lands in higher-up decision-making, nor were they consulted as was required by the central government and urban India's 74th Constitutional Amendment on local self-government, nor given any chance to voice their opinions or about mechanisms of compensation, or about the future. The state government bypassed these requirements through their declaration of Dholera as a SIR, moving it from an industrial township into a so-called *smart-city*. However, a local coalition calling itself the *Jameen Adhikar Andolan Gujarat* (JAAG), or land rights movement, which learnt of the state government's intentions late, began a social action association, together with other villages in the larger region who would be similarly affected by these major developments, of which they were least informed or aware, since they were much lower down the social and literate scale, but whose fundamental rights to land seemed to be at peril. The inhabitants of these backward regions, but who ought to be stakeholders in these ventures, were probably the last to know.

An underlying issue seems to be that in top-down schemes, where the local population is not taken into confidence, there is bound to be protests and differences of opinion. In a way, the aspects of land acquisition has not been looked at -- a sociological aspect of which is that land acquisition cannot be at the cost of farmers and of people whose livelihood is at stake [18]. Questions of compensation, resettlement and similar do not seem to have been looked at beforehand, before deciding on such issues. The question of infrastructure development is certainly at the cost of land that belong in private hands. A basic question is whether the government, state or central, can acquire a piece of land by merely quoting national interest, the fundamental rights of owners including tribal populations or forest dwellers, ideas of judicial process, the manner of compensation, retribution, the time period, and similar – these kind of questions need to be addressed at the ground level before governments launch into schemes, even if of national importance.

Gujarat had already experienced issues of land acquisition and forcible ejection from traditional lands, often with insufficient compensation, rehabilitation or similar. The case of the Sardar Sarovar Dam, where the protests of the *Narmada Bachao Andolan* was an example which simmered for years (1988-2001), and has still left aftereffects [19]. What needs to be reviewed is the basic rights to land, fair compensation, rehabilitation or similar that were crushed by the government in their indulgence and haste to get these built, that they did not care about the affected people who were caught under the juggernaut of the state, the World Bank and the national interest; had it not been for the protests that brought it to judicial, national or international attention, it would have gone totally unnoticed,

but still only gave temporary respite but no permanent solution to about 200,000 people displaced effectively. It needs to be kept in mind that this can happen even in a country with a functioning democracy, and a so-called system of rights and laws.

The fact is that Dholera was declared an SIR, possibly without consultation of the local populace, without giving them the choice, or to a lesser degree, the choice to be a willing participant in such decision-making, then the interests of the state suffers. The adoption of a bottom-up approach is often required in terms of consent, compensation, rehabilitation, such fine and legal points of a social contract between the people and the state. It is often that the state machinery and bureaucracy takes this for granted, and makes top-down decisions, without the knowledge of the local populace, without consultation, or of preparing them for the eventualities of this decision-making, where the involved people are left without choices, are deprived of their land and livelihoods, left to a bleak and uncertain future. Decision-making in a democracy is also a fine art, in allowing the public to become part of the process; people have to be prepared for the eventualities of the decisions, not have these thrust on them, which should not be the way of bureaucratic decision-making.

5. Exploring the Concept of *Smart-Villages*

The late President of India, Dr. A.P.J. Abdul Kalam (1931-2015), back in 2004 proposed taking advances in technology to the villages, so that the multifold objectives to advances of technological development could benefit the rural people as much as the residents of the cities. Thus, development and expertise would bear out to be an equaliser between the inhabitants of the city and the village [20]. Besides, the localised wisdom of the rural areas could be formalised into applications which would be both indigenous to the site, and possibly even find universal relevance. He proposed that:

"Smart habitation is an integrated area of villages and a city working in harmony and where the rural and urban divide has reduced to a thin line." – A. P. J. Abdul Kalam.

This particular idea was projected under the concept of 'Providing Urban Amenities in Rural Areas' (PURA), which Kalam developed and put forward along with Professor P.V. Indireshan, eminent systems scientist and former director at IIT Madras and IIT Delhi. The idea was to bring to the population in villages, the facilities of the city without actually needing to move there. During the 2001 census, it was noted that 72.2% of the population lived in about 638,000 villages and the rest 27.8% lived in around 5,100 towns, and 380 urban agglomerations in the country.

PURA talks of three basic connectives – *physical connectivity* like roads and railways, *electronic connectivity* like telecommunications, the internet and knowledge, which will then result in *economic connectivity*; this will empower villagers, giving them sufficient employment opportunity, and hence bring down poverty levels in the rural areas. Such development would also lessen the need of the villagers to have to migrate to cities for jobs, and the need for India to be urbanised in the manner that one commonly understands as being physically present in cities to avail its opportunities [20]. The uplift of the majority is a foremost requirement in the country, in all spheres of life.

Such progress could be achieved by the use of advancing technologies such as solar energy for electrical power, as well as broadband, *wi-fi* and satellite networks, without actually needing to be actually physically connected; while physical connections with roads and transportation would certainly need to be there, much could be achieved by providing the facilities itself, and minimally some rudimentary training. A *smart-village* was envisaged as a place where a population of 30,000-40,000 would be given the amenities of an urban area, with infrastructure and services in a rural hub, with electricity, roads, potable water, telecom services as well as health and educational services; it was envisaged that 7,000 such smart-villages would be distributed throughout the country, and the project implemented in a public-private participation (PPP-70/30) mode. Unfortunately, the early prototypes ran into untimely problems because of servicing and maintenance, and the idea went into limbo; today however, the scenario is much different, and such troubles can be tackled without serious issues.

The deeper aim of such a *smart-village* was to stem the unnecessary migration from the rural areas to the urban; by providing the facilities of the cities in the rural areas, the divide between the rural and urban would be bridged, and the need for a permanent move to the city could be minimised; this would also imply providing a balance of the socio-economic development between the urban and rural areas. In short, the aim was to bring up the country as a whole into the 21st century, without having to physically change the rural-urban distribution.

As things currently stand, the critical factors that differentiate between urban and rural life is the development of proper infrastructure which will give the facilities of the cities to the villages; the necessity for actual migration to the urban areas are probably not a fundamental requirement, as may be made out to be; the ills of the city of factors like the pollution of air, water and land, congestion of traffic on the roads, inadequate public transportation systems, high real estate prices, sometimes of the 24/7 non-availability of potable water, sanitary and solid waste disposal conditions, and similar; much of it would depend on the location and type of city that one is talking about, being distributed around the country where the basic resources and infrastructure also vary. So too, would conditions fluctuate during the year, during the monsoon, or during the various festival seasons – which in some manner makes the life in every city relatively unique. While it might not be necessary to migrate to the urban areas to be economically better lifestyle, it really could be a myth that was being perpetuated, before the development of current technological solutions.

5.1. Mitigating the Process of Migration

Migration from the rural areas to the urban seem to always be a matter of concern, it is also that there could be several reasons that farmers choose such a condition. One cannot be sure that it is always a conscious choice like the unavailability of adequate school facilities for children, or income ability from agriculture, food, water or electrical power conditions.

Economic factors like recurring crop failure caused by inadequate, or untimely rain, droughts and similar can cause a farmer to abandon agriculture, and move to the city in search of sometimes menial jobs, merely to subsist. In such a move, the years of accumulated knowledge and experience of the farmer comes to naught and is hardly used again. Some farmers take the drastic step of suicide when they cannot repay agricultural loans taken for the last or next season's planting, some of these also from private parties at higher than normal interest rates. Though the state itself acquires the crop at a minimal fixed price, which goes into the public distribution system (PDS), at some earlier promised rate, which is a fraction of the wholesale or retail market; often, also the farmer sells the produce to middlemen, one or many, who make the actual profits from agriculture, and not the farmer her/himself. Farming is also physically back-breaking, there is no old age insurance, no benefits like a pension, nor such promise for children's education, or similar.

However, on a positive note, in comparison to life in a city, it can be speculated that in the usual case, the farmer is living in usually un- or minimally polluted air, water or land; s/he utilises his/her knowledge of the seasons, of the use of natural cycles, and similarly for the benefit of their own existence or subsistence, of that of others, in a dependency equation that the farmer produces food for the nation, and is also therefore part of the national economic system. The farmer also has that natural attachment to the land that he owns or cultivates, as a source of livelihood, as the sole economically viable property, as well as has a psychological affinity; s/he would part with it only when forced to, and under extraordinary circumstances.

It is sometimes the case that the farmers, close to urban areas or infrastructure corridors, part with their land willingly to speculators who wait for land prices to rise and offload it at ever increasing land prices. On the other hand, it is also that sometimes, the state itself forces farmers to part with their land in the name of state or national infrastructure needs, at minimal cost or compensation, or with compensatory land given in remote areas without sufficient water or other agricultural resources. Sometimes, the state itself then turns around and sells this same land to private individuals at much higher prices; sometimes, the land is awarded at cheap rates for industrial purposes, but who also in their turn, develop and sell it at a profit – none of these in any way economically benefits the original

owner, the farmer himself/herself. Such cases are routine; they also have little recourse to legal means, which on their own can also drag on for years, before any verdict is given, favourable or unfavourable.

The reasons why the proposal by Abdul Kalam [20] or similar suggestions need to be taken seriously is because 1) it stems the need for rural-urban migration, 2) to bridge rural-urban divide by providing facilities of the urban areas to people in rural areas, and 3) to provide balanced socio-economic development, not just to those who can benefit from moving into the 21st century lifestyles or its benefits. It is observed that even though a state like Punjab would be classified as largely agricultural, and hence classified as rural, many of their lifestyles are equally progressive as those of most urban areas. Kalam also states this to be a US$ 150 billion opportunity for the country to become equal on most international parameters, and thence compete on the world stage [21].

Explorations of using information technology for a developing world has been explored both indigenously as well as at the upper levels such as at the Massachusetts Institute of Technology (MIT), and they have [22, 23] come up with sufficient suggestions which can be used in the Indian context. A significant problem that is faced by the people in India is not that of illiteracy, but more so of the diversity of languages, which to be overcome can only be tackled from within the country itself.

6. Discussion

Some of the reasons adopted by the current government, that the national urbanisation rate would reach fully 52% by 2050 [3] does not necessarily have to be a given. These kinds of seeming predictions could set in motion a wave of unrest among residents of rural areas, into the belief that life as we know it cannot continue, and that migration to urban areas is almost a necessary fact. McKinsey's report [16] on urbanisation seemingly informs us that:

"the quality of urban services will deteriorate sharply by 2030 if present urbanisation levels continue. For example, while cities required 83 billion litres water per day in 2007, the supply was only 56 billion litres. By 2030, the demand will rise to 189 billion litres, while the supply will be only 95 billion litres. Similarly, by 2030, the demand for affordable housing will rise to 50 million units, the supply will be just 12 million units. The gaps in other urban services—solid waste management, sewage disposal and transportation – will be similar in proportion. The expectation is that to bridge these gaps, India will require an additional investment of $1.2 trillion. While these are only conditions of economic forecasting, there is no certainty that such conditions are a necessity".

While the reports by McKinsey [16] lays out a possible future scenario, it sounds out like the only possible future one, which it is not. The provision of adequate infrastructure in rural areas, including physical, commercial or educational, can act as a deterrent to expected migration, both in time and in space; this deterrence would, if at all necessary, provide time for the planning authorities to lay out some basic or possibly the best infrastructure, in the expectation of future needs. The motives of ICT companies like IBM, McKinsey or Cisco are without doubt self-centered, and looking at the bottom-line in their accounting books, their interest does not have much in terms of the country's development. Firms like McKinsey, also have a differing yardstick to measure life more exactly urban life, are probably unable to fathom the realities of a populace that is tied to its land, the source of the sustenance of the country.

The Union Ministry of Urban Development states that the main feature of a *smart-city* is the "*intersect between competitiveness, capital and sustainability*". It underscores economic sustainability as the key factor, thus, envisioning smart-cities that are "*able to attract investments and experts and professionals*". The real question might be whether the government can afford to ignore the rural areas in its push to develop smart-cities, which seem to benefit only a certain class of the populace, ignores the plight of the farmers and rural folk, and at the same time goes as far as to take away their only source of livelihood. Is it more important to ensure that the economy is rising to meet that of its global partners, in its rush to keep up with the Joneses next door.

7. Conclusion

In reviewing some of the mentioned realities that the country is to face in its future, it can be gathered that much of the proposals being put forward by the government might merely serve to push the idea of development to bring the country up at least into the 20th century. The idea of *smart-cities* would mostly serve to bring in foreign direct investment (FDI) to set up basic infrastructure; how this will play out in the rural areas does not seem to have been elaborated. As mentioned, in the haste to develop new *smart-cities* like Dholera from scratch has already run into rough weather, but might additionally be at the cost of basic and constitutional freedoms of a part of the population who have not been taken into confidence. If these, the real stakeholders are not made part of the equation, it is uncertain what direction the country will take in the future. The first smart-city is already experiencing teething problems, it is therefore uncertain how a 100 smart-cities are going to follow through. While the basic statistics on the country shows that there are many parameters on which the country is lacking, might it not be better to work on home-grown and known solutions such as Kalam's, for solving wider-ranging problems rather than try to look at narrow solutions and try to jump ahead of the possibilities.

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