

Planning for Urban Sustainability: Case study of Chilla Saroda Khadar in Yamuna Floodplain Development

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ABSTRACT: Social equity and community engagement are essential components of sustainable urban planning and development, although a challenging task to achieve. The goal of this research was to begin to understand how food availability and accessibility are being impacted by Urbanisation. Chilla Saroda Khadar becomes a symbol of the larger debate of prevention and protection of a fragile dying ecosystem and compulsions of development specifically in developing countries of Asia.

KEYWORDS: sustainability, development, equity, community, infrastructure, population, conflict, urban agriculture, encroachment, livelihoods

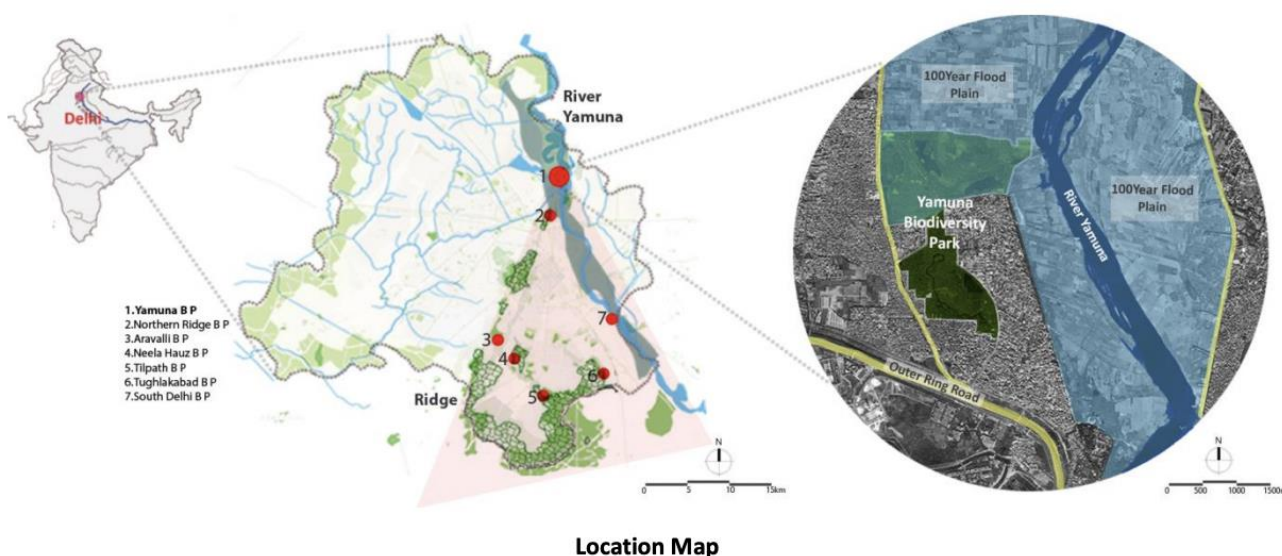
INTRODUCTION

Social equity and community engagement are essential components of sustainable urban planning and development, although a challenging task to achieve. This microscopic research was undertaken to evaluate the unplanned/ planned, authorised and unauthorised “development” of an environmentally fragile and sensitive area of Yamuna floodplain and its impact on the livelihoods of farmers of Chilla Saroda Khadar. Chilla Saroda Khadar is a small village on the eastern bank of Yamuna in Delhi. This village symbolises the practice of urban agriculture but it is more than a description of farmers growing food in an urban context. It is about the challenges, opportunities, and lived experiences of individuals and families making a livelihood on the floodplain of one of the largest megacities in the world. It is about a growing, thriving city struggling to develop and improve infrastructure for its citizens. It is about the challenges of increasing the sustainability of the city. It is an exploration into the interface between community, economy and the environment in trying to move toward sustainability. Chilla Saroda Khadar becomes a symbol of the larger debate of prevention and protection of a fragile dying ecosystem and compulsions of development specifically in developing countries of Asia.

Yamuna Floodplains and the Study Area

The Yamuna has been the defining landmark of Delhi for at least a thousand years; the seven earlier kingdoms of Delhi were basically confined in a triangular area between the west bank of the Yamuna and the rocky tail end of the Aravali hills known as the Ridge. The eighth - the modern city of Delhi - spreads on either side of the river over a 25 km stretch. The river is fed by melting snow in the Himalayas, but also serves as the drain for monsoon rains in its catchments. The flat low-lying areas adjacent to the river on both banks as it passes through Delhi bounded by embankments provide the river with the increased carrying capacity that it needs during the monsoons and allow flooding in a predictable way.

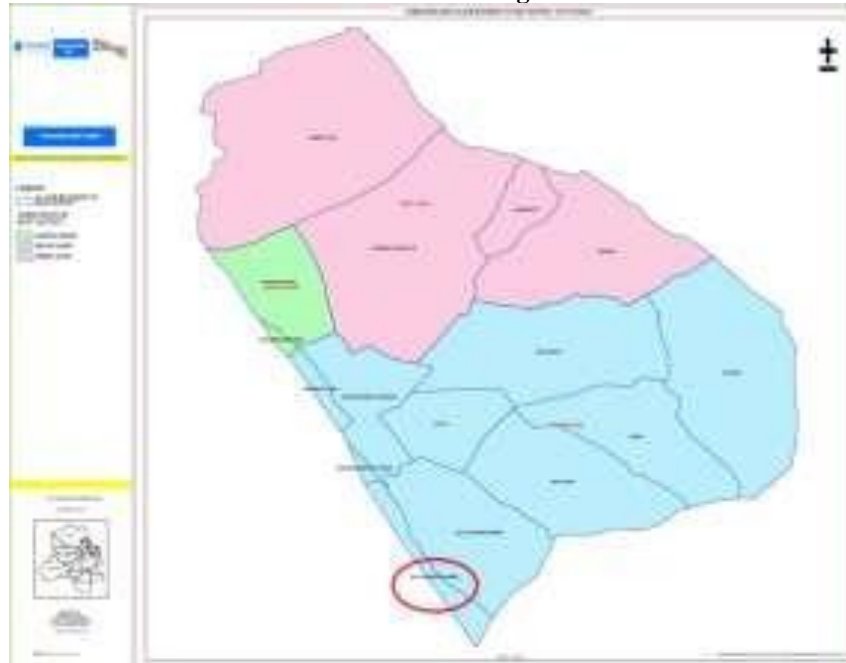
Environmentalists believe that the floodplains play an important role in recharging the ground water aquifers of Delhi, a city already struggling with water shortage and a falling water table. Delhi is a rapidly growing with an estimated population of 17-18 million and declining open spaces and the Yamuna and its floodplains comprising close to 9 per cent of the area of urban Delhi provide a crucial reserve of open space and greenery. Seen against this backdrop, the Yamuna floodplains stand out as a priceless natural endowment of Delhi, to be carefully nurtured for present and future generations.



Location Map

The River Yamuna in Delhi is a highly braided system due to construction of embankments all along the stretch for flood protection. The floodplain area restricted within two bunds covers an area of 94.84 sq. km. The longitudinal and lateral flows of water within the stretch essentially determine the floodplain of the river system. The rainfall, confined to the monsoon from July to October, results in the lateral flow of water after attaining bank-full level of the river channel. The river thus is left with limited floodplain area for inundation even during monsoon. The channel morphology in this area also helps to maintain a large floodplain area subjected to inundation almost throughout the year. The current land use in the floodplain area is dominated almost equally by forests and agriculture with almost insignificant proportion comprising lakes / ponds. This is mainly due to conversion of fertile floodplain area for agriculture. Forest Department without understanding nature of the floodplain system has profusely undertaken plantation within the stretch. Connectivity of water bodies has also been lost due to unplanned developmental activities thereby seriously impacting biodiversity of the entire river system.

Chilla Saroda Khadar village code 8800



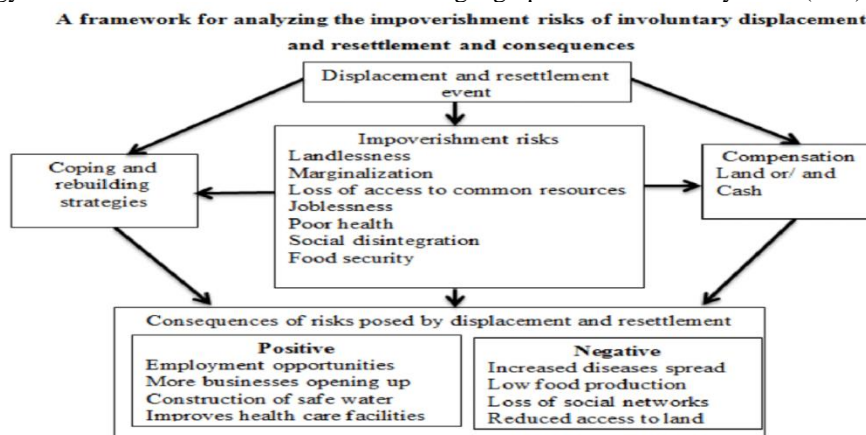
Village Chilla Saroda Khadar: Subdivisions of East Delhi

Source: <http://www.delhi.gov.in>

Unfortunately, the river floodplain in the city has witnessed a gradual land use change through encroachments either by illegal encroachers or, mostly by State created structures like cremation grounds, sports complexes, thermal & gas power stations, bathing ghats, Sewerage Treatment Plant and Metro depots. Yamuna khadar area, the most fertile part of the floodplain, stretches along the entire belt of 22 Km. of Yamuna in Delhi. Due to limited scale and scope of study, the area chosen is one village, the Chilla Saroda Khadar, opposite Mayur Vihar, a residential area, in East Delhi. This region is an ideal example of a place trapped in duality of urban development and environment conservation as agriculture is still practiced here. In many other areas where infrastructural development has taken place or is yet to happen, farmers have been evicted and thus it would have been difficult to find respondents in those locations, thus making Chilla Saroda Khadar an optimum study site.

METHODOLOGY

The goal of this research was to understand how food availability and accessibility are being impacted by urbanisation. Detailed interviews with farmers were done to understand the description of urban agriculture within and around Delhi. Michael Cernea’s theory on impoverishment, risk and rehabilitation has been used in this study, to carefully determine the losses to the two different stakeholders. Understand the different stakeholders involved, farming locations, products grown, product destination, scale of roduction, and technology used. Data collection methods included geographic information systems (GIS) mapping, semi-



structured interviews with farmers and key informants, participatory mapping, field observation and photography.

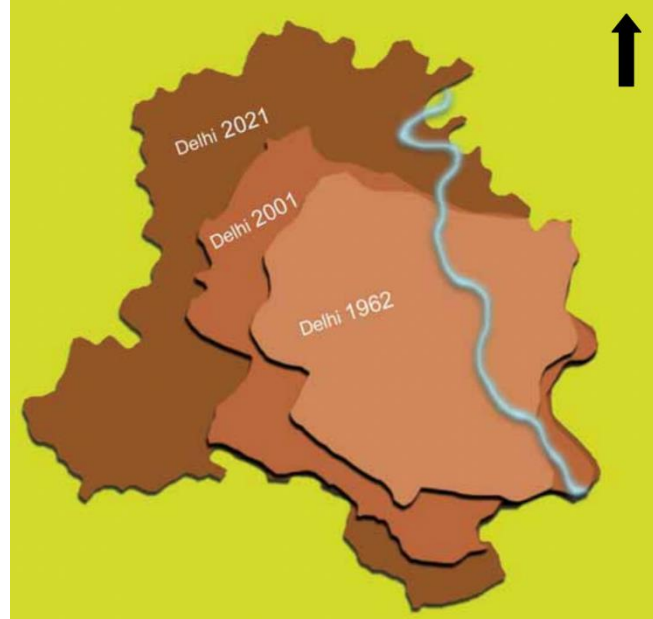
URBAN AGRICULTURE IN FLOODPLAINS

Food insecurity affects rural as well as urban and peri-urban areas, as a consequence of the increasing number of people moving from the countryside to cities and rapid urbanisation. This requires transforming the ways of producing, distributing, marketing and consuming food, including land-use, exploitation of resources, waste management, transportation and infrastructure chains. Malnutrition (both under-nourishment and overweight and obesity) has become a major urban issue, affecting low income and vulnerable residents in particular, with alarming implications for public health. Cities play a crucial role in addressing community needs, sustainable economic development and ecological security through urban agriculture. Rene van Veenhuizen is of the opinion that the distinguishing characteristic of urban agriculture is that it is an integral part of the urban economic, social and ecological system: urban agriculture uses urban resources (land, labour, urban organic wastes, water), produces for urban citizens, is strongly influenced by urban conditions (policies, competition for land, urban markets and prices) and impacts the urban system (effects on urban food security and poverty, ecological and health impacts). Urban agriculture represents the complexity of urban farming in relation to development pressures, rural-urban migration, sustainable practices, and access to resources, livelihood strategies, community engagement, community empowerment, public voice, citizen representation, distribution and urban markets, and on and on.

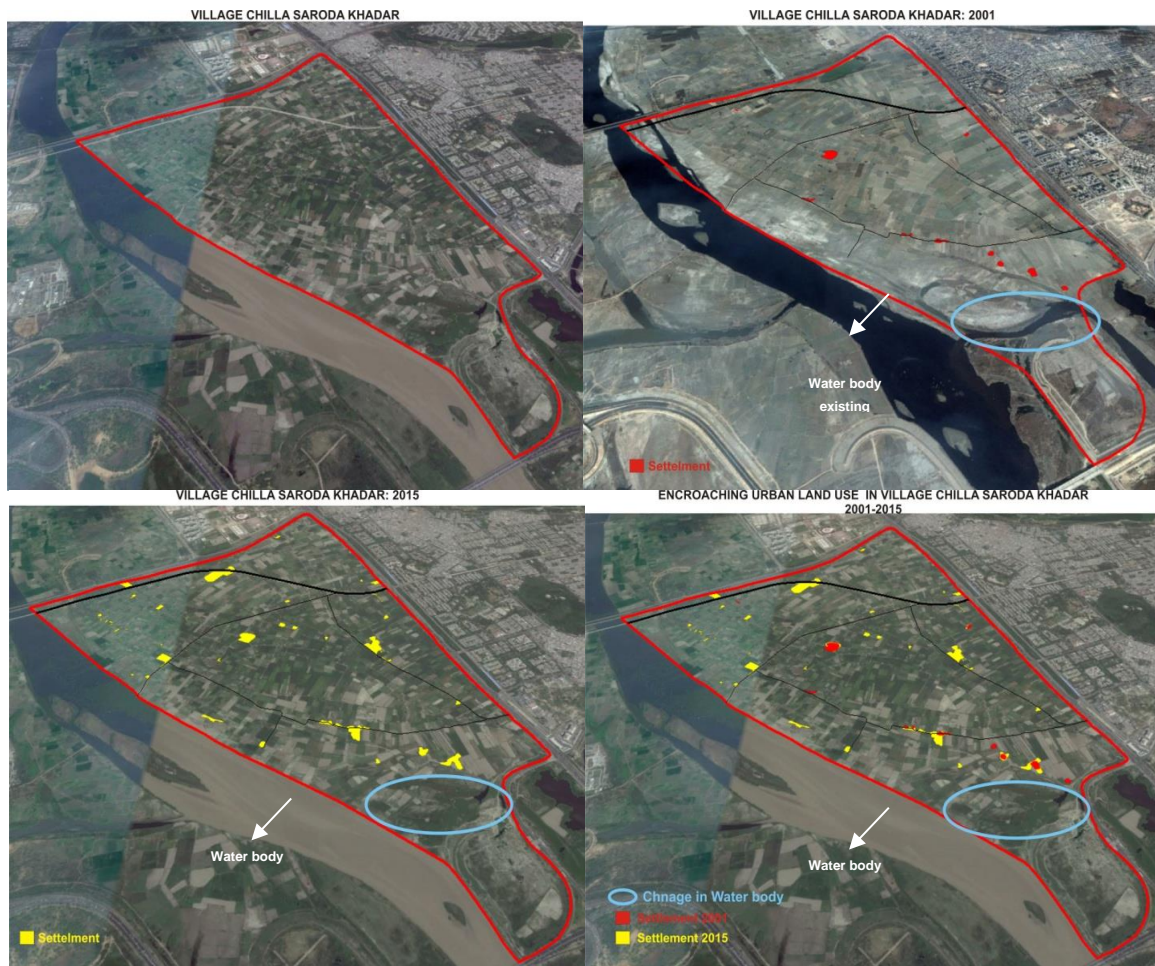
In Delhi, cultivation is limited to that of vegetables and to a small extent, of flowers. Since Delhi is the national capital and a large metropolitan city with a very high per capita income, vegetable cultivation and distribution is a profitable activity. However, urban agriculture along River Yamuna in Delhi faces many conflicts. Firstly, poor water quality of the river water makes irrigation difficult and necessitates digging of tube-wells, which are costly both to build and operate. Secondly, land availability in Delhi raises a number of complications due to ownership contestations, squatter's rights, population increase and continuous development pressures. Thirdly, use of organic fertilisers is almost negligible thereby leading to deterioration in soil quality. Additionally, use of chemical fertilisers has led to the contamination of ground water.

THE DILEMA

Land use in Delhi is sought to be regulated the Master Plan. The 1962 Master Plan of Delhi designated the Yamuna floodplains as a green area reserved for water bodies and agriculture. With the rapid urbanisation, physical planning and capability of infrastructural improvements, long rivers passing through the city seemed to be too restrictive for



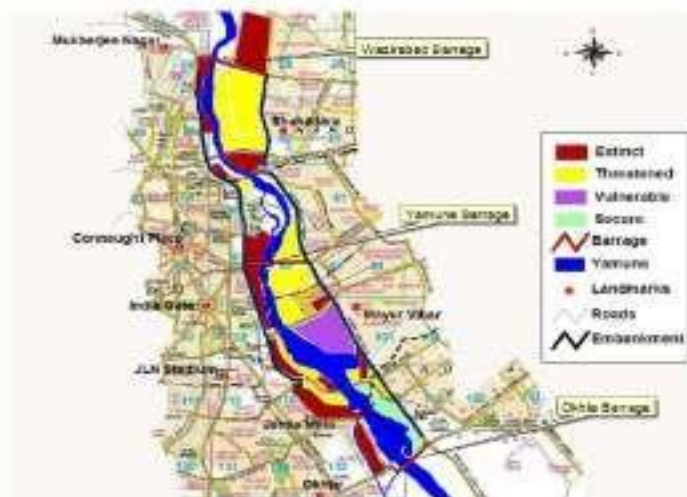
development. With visions of Paris on the Seine and London by the Thames, the planners came up with proposals to turn the stretch of the Yamuna flowing through Delhi into a canal, restricting its width and opening up the floodplains for 'riverfront development'. In the case of Delhi, Dupont (2011) argues that the new world-class-city agenda has led to intensified socio-spatial polarisation, slum demolitions and overwhelming negative consequences for the urban poor. Although various technical studies pointed towards many risks associated with such proposals and questioned the benefits. However the idea was never completely dropped by the government. It was simply carried forward in a different way - by changing river bed use in an ad hoc manner from time to time, and by handing over the floodplains for other uses piece by piece. Constructions were permitted on the floodplains through 'notified amendments' to the land use permitted in the Master Plan - with amendments being made sometimes to legalise a land use change post facto. An amendment, for example, permitted the construction of the massive Akshardham temple on the eastern floodplain of the river in 1999. Another amendment allowed development of a Delhi Metro depot further north of the temple, in 2003.



The following map shows the condition of the floodplain in terms of exploitation by construction:

CONSTRUCTIONS WHICH ARE EXISTING, ONGOING AND PLANNED THE RIVER BED OF RIVER YAMUNA IN DELHI

Present state of river bed in Delhi



In 2007, Yamuna Jiye Abhiyaan, a local NGO, fighting for the life of Yamuna, released a report titled “Yamuna floodplains Under Siege in Delhi” giving an account of the various parties which defied court orders and were continuously encroaching upon, abusing the land, planning further- legally or illegally- the development or infrastructure creation on the Yamuna Floodplain. Examples of religious, residential and commercial structures coming up/ planned on this land were also cited.

The map highlights that east of the Yamuna was up for grabs by the highest bidder or the most influential. “The fact that the above map is just an excuse to convert and concretize a bed in the east of Yamuna, becomes clear when one looks at the proposed map of Zone “O” prepared by DDA which proposes several new structures in the river bed as part of a Draft Zonal Plan for Zone “O” (river Yamuna) under MPD 2021”.

MASTER PLAN 2021

In the Master Plan of Delhi 2021, the National Capital Territory of Delhi has been divided into fifteen zones designated “A” to “P”. River Yamuna & its River front are designated as Zone “O”. The aim of the Zonal Development Plan of Zone “O” was to revive river

Yamuna. The strategies suggested for riverfront development included, first the establishment of riverfront walkway, trails, parks. Second, a visually pleasing arrangement on the river's edge was to be created. Third, it was felt important to lure people and investment for the river front development. Fourth, development of an arts/entertainment/ cultural district on the river front was thought of. Fifth, expansion of leisure and recreational uses of the river and riverfront were suggested. Sixth, emphasis was put on creation of pedestrian streets that connects to the riverfront. Seventh, provision of outdoor activities for people was felt necessary. Last, provision for opportunities for boat launching and storage were imagined as well.

It is evident from the proposal that greater priority is now given to recreational areas. As a part of that scheme, a biodiversity park has already been created near Wazirabad (North West bank of Yamuna). The banks of the river which are not under any construction are further planned to be developed as biodiversity parks/ regions.

THE LOCAL NARRATIVES

Most of these urban farmers have migrated from UP and Bihar and have taken riverside farmland on rent or on crop-sharing basis from the land owners who live in east Delhi villages. They grow wheat, rice, and vegetables such as cauliflower, mustard, bitter gourd, okra, tomatoes, melons, watermelon, carrots, and radishes. The farmers here represent a group of people who are socially bounded through similar profession, income, religion, village of origin, etc. and geographically bounded by the Yamuna River, major roadways, and dense urban development. During the survey total 25 farmers were interviewed. Out of these 25, five farmers were leaseholders and belonged to Delhi itself. These leaseholders had not given their land either on rent or sharecropping and cultivated their land on their own by hiring agricultural labor on daily wage basis. The rest twenty interviewees were agricultural migrants. They all belonged to *Badaiyun* district of western Uttar Pradesh, India.

The farmers, after excluding costs, have annual returns of at least three to four Lakh Rupees. More so, if the size of land is bigger. In addition, besides the sale, the vegetables grown here also feed their families. For leaseholders who have given this land on rent or are part of a sharecropping arrangement, the returns could be similar or maybe lesser. For those practicing sharecropping the inputs, like seeds, fertilizers and pesticides are becoming costlier by the day but the increase in price of vegetables (the main output) is abysmally low. Also as all costs and profits are divided by two, the return is not expected to be large. It is also significant to note that a very high majority of farmers, both leaseholders and tenants, practicing any kind of cropping pattern, like to sell their produce on the field itself, to what they call a "*graahak*". "*Graahak*" or customer is a vendor who stocks up the vegetables from the field and sells it in the city, either independently or to the "*mandi*" (wholesale market). The margin obtained by him is as good as double. Farmers prefer this system of sale as, in their logic, cost of transportation and indirect costs of time & energy spent, nullifies the additional return.

Besides the rent and (or) cost of inputs, these farmers also have to pay daily wages to agriculture laborers (if hired) at Rs 150 per day (2.4 USD), diesel for the tube-well and cost of rented tractors, at Rs 100 per bigha (1.60USD per 2400 sqm). After subtracting the costs of cultivation, a tenant farmer with an average landholding of size 6-8 bigha earns up to rupees two to three Lakh Rupees (3000-4000 USD) annually. In addition the vegetable requirement for him and his family is met by their agricultural produce itself. In case of an agriculture labor, when the agriculture season is over, and even during the season, they take up other work as well. Some of the farmers with rented/shareholding land also work as agricultural labourers in the fields of their neighbours to earn extra money, when work on their land is done.

Life is a mix bag of difficulties and hope for these urban farmers. Apart from the fear of flood in the river destroying their crop, they also have to contend with the fear of their huts being demolished by the government. When the water level rises in the river during monsoon, they have to leave their huts and settle on the Mayur Vihar-Noida link road and NH-24. In 2014, hundreds of these farmers lost their crop to floods and had to live, for over a month, on the Mayur Vihar-Noida link road. "We lived on the edge of the road, and I was afraid for my one-year-old daughter that she might be run over by a speeding car. Life is quite difficult if you are a farmer in a big city like Delhi, where you have no identity and respect," said Parveen. "The only benefit is that unlike in our villages, we have a ready market here to sell our produce. Though we also have easy access to government schools and hospitals but they are hardly any better than those in our villages."

These farmers also fear the government bulldozers, which they say, demolish their huts twice a year. "The authorities ask us to shift across the road in colonies such as Mayur Vihar and Patparganj, not realising that we are rural folks who like to live near our farmlands. Besides, we cannot afford the rents in the city. Where can we shift our buffaloes, tractors and tubewells," asked Ram Kishore, aged 20. These farmers have no electricity, water or gas connections. Most of them use batteries to light a bulb in the night, and travel to Patparganj to get their batteries charged for Rupees 40. "The whole city is lit up around us in the night, but we live in complete darkness, even during festivals such as Diwali," said Om Shri, whose hut stands barely 200 metres from the Yamuna.

FLOODS, BIODIVERSITY PARK AND PROTESTS

A feeling of temporariness for the occupancy of this land is felt by the migrant farmers. It was reinforced in 2010 and even later when the police demolished their huts. During the Common Wealth Games held in 2010, farmers were allowed to engage in farming here but not reside here. The farmers (leaseholders) don't understand this "encroachment" as they say we have papers to prove our lease. Therefore many court cases, against the DDA are running in the court and the leaseholders regularly go for hearings. Most farmers here feel that the forces of development will eventually take them over in a decade. "Our future is uncertain. Come here after ten years and you might see housing colonies and flyovers, not our fields," said Sattar, staring blankly into space. Development is a constant and largely unknown threat for these Yamuna farmers. There are cases where a farm family was just a few days or a week from harvesting a crop and construction notice came without notice. The most challenging aspect of farming in a development zone is not knowing when a development project would ruin your hard work and take away your land.

ISSUES RAISED

Planning in Yamuna floodplain, Zone "O" of Delhi and the case study of Chilla Saroda Khadar has raised many issues related to the livelihoods of farmers living in the Yamuna floodplain in Delhi. With growth in urbanisation, the area under cultivation has

significantly declined over the years, in the process threatening livelihood and food security and creating socio-economic and ecological instability. Unemployment of the rural population, inward and outward migration and unauthorised and authorised construction are some of the outcomes. In addition, the cropping pattern has shifted from staple food (grains and fodder) to comparatively more commercial crops of vegetables and flowers. Also, with growing commerce and trade, agriculture hardly contributes to Delhi's economy. Instead the land put to non agricultural uses has increased tremendously and agriculture as an employment has declined significantly. The apex planning institution of Delhi, the Delhi Development Authority on the other hand, considers these farmers as illegal encroachers.

Issues of planning, environment, displacement, livelihoods and urban governance that have been combined together to study in this research are all part of the existing literature at a macro level. Such a wide angled view has so far not enabled the policy decisions to work in the advantage of those affected at the grass root level in a developing country like India, where development is continuous and considered the need of the hour. This kind of rapid urbanisation is constantly taking toll, directly or indirectly on people's lives. Here, the conversion of Chilla Saroda Khadar or the zone „O“ at large, into a biodiversity park, emerges as a unique form of development in a city. One, which aims to conserve, preserve and rejuvenate the natural surroundings. However, in the process it will dislocate a huge section of people, dependent on this area for their livelihoods. This struggle is comparatively recent in nature and has raised many questions on the unplanned growth/development in the urban metropolitan Delhi.

These farmers in the Yamuna floodplains, the ones to get dislocated, have always been and still are excluded from policy formulation and implementation. Therefore, a class division becomes apparent in these policies, documents and institutions responsible for urban planning of Delhi. In addition, the hierarchical organisations and the decisions made by them are unsuitable for sustainable growth, without people participation. Urban planning needs to have a broad aim of people first, "local level sustainable development, acceptance of heterogeneity and tradition as norm".

Michael Cernea's theory on impoverishment, risk and rehabilitation has been used in this study, to carefully determine the losses to the two different stakeholders. Interviews of twenty five farming households inclusive of both leaseholder and migrant farmers give a firsthand account of their lives and livelihoods that are associated with this land. Loss of access to land to the farmers can turn into a social hazard as it generates a cluster of vulnerabilities which culminate in impoverishment and poverty. The onus of landlessness which creates poverty is on social institutions, which on their path to modernisation are not only creating these risks but also are increasingly becoming inaccessible to those affected by risks.

If explained on the basis of the Impoverishment Risk and Reconstruction (IRR) model given by Cernea, then the risks associated with displacement which these migrant farmers are vulnerable to are the risks of landlessness, joblessness, homelessness and food insecurity. Therefore if adequate measures are taken for risk mitigation and appropriate compensation is given, these poverty inducing risks can be avoided. Baviskar's "environmentalism of the rich" is very apt here, as this sort of land use change crushes the environment of the poor in an urban space like Delhi. Therefore, a contestation over space exists between the rich and the poor, manifested through the master plans of Delhi over the ages.

Before the State takes away the land at Chilla Saroda Khada, it should provide measures to safeguard the people who will be most affected from the resultant risks. Broadly, these would be adequate compensation to each affected party, land for land based resettlement and reemployment for farmers. The benefits of preserving this region far exceed the costs of construction on it. There is a requirement of change at the idea, policy formation and implementation level, so that development should not take place just for the sake of it, assisted by tools like CBA and EIA which work towards aiding development instead of capturing the holistic approach.

CONCLUSION

Cocidering the pressure on land due to incessant growth of the city, a Biodiversity park may seem a more logical decision. As according to Amita Baviskar, "Bourgeois environmentalism is mainly about maintaining a certain spatial order--a 'clean and green ' environment, aesthetically slick and sanitised--without looking at one's complicity in creating environmental problems in the first place. What is encountered in urban Delhi, is using the idea of protecting the environment to achieve goals that are antithetical to ecological sustainability as well as social justice." Considering the life and livelihood of a large number of families/households in Chilla khadar are, the State needs to adequately compensate each one of these families, notwithstanding the complex legalities involved, the resulting scenarios or cost-benefit ratios will change. In other words, if the costs of compensation/rehabilitation are added to the cost of converting this area in to a biodiversity park, the benefit to Cost ratio will be much lower, and this land- use change then may not appear so attractive to many policy/decision makers

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