



# Urban and climate change resilience: A case of France colony, Islamabad

Latif Abdul<sup>a,\*</sup>, Taofang Yu<sup>a</sup>, Muhammad Yousif Mangi<sup>b</sup>

<sup>a</sup> Urban Planning & Design Department, School of Architecture, Tsinghua University, Beijing, PR China

<sup>b</sup> City and Regional Planning Department, Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan

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## ABSTRACT

This paper attempts to explore the socio-economic characteristics, and urban and climate change challenges of France colony, Islamabad. The study reveals that society confronts several challenges due to haphazard and uncontrolled growth. They are the consequences of people's need to find an affordable place to live, which comes at the cost of streets, streams, and open areas. In spite of being at the center of Islamabad and surrounded by the posh sector F-7, the colony has failed to grab the attention of policymakers and municipal managers. Resultantly, this informal settlement has been left to fend for itself during emergencies. The paper has recommended some viable recommendations, which include the provision of municipal services and regulated growth for resilience building.

## 1. Introduction

Cities are centers of growth and development [1–3]. In developing countries like Pakistan, a 1 % increase in urbanization increases the economic growth rate by 1.1 %. Urbanization and an increase in GDP per capita go hand in hand i.e., the higher the GDP per capita income of the country, the greater the rate of urbanization [1]. Moreover, urbanization and per capita productivity and therefore income have a direct correlation.

South Asian cities have grown exponentially due to internal growth, rural-to-urban migration, and the inclusion of peripheral towns. When the government and the private sector fail to meet the pace of housing demand; slums and informal settlements start developing either within the city centers or in their peripheries [4]. These settlements suffer from serious climate and environmental challenges.

Kanger and Schot assert that the haphazard and unregulated expansion of cities in the global south, coupled with the impending climate change hazards, pose multifarious challenges such as environmental degradation, climate vulnerability, and socio-economic disparity [5]. It is therefore imperative for cities to take climate change adaptation and mitigation measures to have resilience to shocks [6].

Pakistan's capital Islamabad, one of the highly developed and well-planned cities in the country, has started to face many urban challenges [7,8]. One serious issue is the emergence of several informal settlements along its stormwater drains, marginalised lands, and open spaces [9].

An estimated 24 slums exist in Islamabad. They have a total population of nearly 81,000 [10]. Some major slums include Mera Jaffar,

Muslim Colony, 100 Quarters, and France Colony. Mera Jaffar and Muslim Colony are the first and second largest slums in Islamabad. Barring a few, the majority of other slums are located in city peripheries. Their occupants are mainly Muslims whereas people of some other faiths also reside in them.

On the contrary, France's colony is predominantly a Christian neighborhood. The city administration laid a foundation stone for this colony to provide temporary accommodation to minority Christian laborers, who helped build the city in the late 1960s and early 1970s. The colony has since grown into a large residential complex. Unlike its surrounding upscale neighborhood, France colony is deprived of municipal and emergency services. Hence, a significant social and economic disparity has emerged between the colony residents and those living in the adjacent posh F-7 sector.

To identify the reasons behind this widening gulf in the socio-economic situation, level of vulnerability, and provision of municipal services to the French colony residents and those who live in surrounding highly developed and elevated areas, this paper has attempted to (1) analyze the colony's socio-economic characteristics, (2) find its urban and climate vulnerabilities, and (3) measure its community resilience.

## 2. Literature review

Urban resilience is defined as an urban system that maintains its required function after a disturbance [11]. Similarly, community

\* Corresponding author at: Scholar, Tsinghua University, Beijing, PR China.  
E-mail address: [marilatif@yahoo.com](mailto:marilatif@yahoo.com) (L. Abdul).

resilience is described as the capacities, skills, and knowledge, which enable communities to recover from disasters [12,13]. In the context of climate change, resilience is commonly perceived as the capacity to respond to the effects of climate change and bounce back to rebuild and grow from climatic hazards [14]. It is considered a metaphor if applied in the context of human beings and their surroundings [15]. An example of such a metaphor in planning is The City Beautiful, which emphasizes majestically built grand buildings and sets them in beautiful landscapes. This approach is usually dominant over nature [16]. The other metaphorical urban planning approach is The Garden City, of which Islamabad is an example. In this approach, mega-productive and recreational green spaces are zoned and placed in isolation from crowded commercial, residential, and industrial sectors. The metaphor further hones the resilience concept, its frameworks, and progress.

The community resilience framework perceives resilience from various adaptive capacities [15]. These capacities originate from promoting economic development, building social capital, developing information and communication systems, and enhancing community competence. Economic development is the foremost tool to make a community resilient. It can be achieved by equitable resource distribution and assessment of risk and hazard vulnerability. Similarly, social capital is an individual's investment, and access to the resources available in social networks to achieve positive outcomes [17]. Social capital is built with the availability of networks, people's linkages, social support, their engagement in leadership roles, and developing community bonds.

Information dissemination is the basic component in a community to enable adaptive performance [18]. Information and communication capacity relies upon the existing infrastructure to inform the public through trusted media sources. Likewise, "Community Competence" alerts the risk-prone localities of their potential vulnerabilities and how to mitigate those risks innovatively and cooperatively [15]. Critical reflection, problem-solving skills, flexibility, creativity, efficacious empowerment, and political participation determine the successful execution of community competence.

Desouza and Flanery have developed a framework to conceptualize the resilience of an area [19]. It focuses on different stressors that make a region vulnerable, the outcome of these stressors, and a set of mitigation measures. Mitigation measures are further divided into two categories i. e., physical and social. The former consists of resources and processes, which can be either natural or artificial [19] such as infrastructure, buildings, and built environment. Whereas the social elements are composed of people, institutions, and their activities. Among them, people's role is very crucial. It is the community that knows the vulnerabilities and devise ways to mitigate them to make their locality resilient.

### 3. Research methodology

The methodology is the systematic and theoretical analysis of the methods applied to the field of study. It's the science behind choosing a research method. For this research, the case study method has been selected, which is appropriate in the social sciences for in-depth analysis of an intricate phenomenon of a specific place or an incident [20]. It is also suitable for enlarging the scope, extending insights, and improving the analytical power of research on complex human phenomena [21].

We conducted extensive transect walks to understand the locality and the livelihood of its residents [22]. It is also defined as a method for on-site understanding its diversity and characteristics in a unique context [23,24]. This method also strives to understand social relations in an informal community [25]. It helps on-the-spot discussion about a specific issue and gather community feedback.

Through transect walking, we took different routes to understand the locality labyrinth, such as zigzag streets, architecture, the provision of services, the economy, and people's day-to-day survival challenges. We collected primary and secondary data for the research. Sources for

primary data were interviews, focus group discussions, and personal observations. We approached French colony residents through different close-ended questionnaires for collecting their socio-economic data. We targeted a sample size of 200 for the study by using a small sampling technique [26]. We directly accessed half of the respondents and distributed the hard copies of the questionnaire, while the remaining half were approached through the Internet using social media, direct messaging, and emails by sharing the Google Form link.

Sampling techniques included simple random sampling, snowball sampling [27,28], and purposive sampling from the probability sampling method for selecting interviewees. We prepared an interview guide and had it pilot-tested. The questionnaire was semi-structured [29,30] so that the respondents could have the flexibility to express their ideas and also allow exploration of additional themes from the discussion [31,32]. Each interview lasted for around ten to fifteen minutes whereas the duration of the focal group discussion was thirty minutes depending on the interest and involvement of the group.

The data collection process was smooth. Nearly 95 % of the respondents submitted their replies whereas only 5 % had either submitted incomplete or erroneous data. We generated a data form through the Google website (<https://google.com/forms>) and circulated it to the targeted population (Table 1).

We used content and framework methods for data analysis. We transcribed the recorded data and developed preliminary themes [33]. We used Microsoft Excel to code the transcribed data and convert it into categories to move from "empirical data to generalization" [34]. Finally, we established patterns and relationships for identifying the urban and climate change challenges and development loopholes.

### 4. Theoretical framework and data analysis

The theoretical framework for addressing the third and most important objective of this paper is the application of Resilience Star and Radar of the International Federation of Red Cross and Red Crescent (IFRC). The Federation designed and developed these community resilience measurement tools in collaboration with Banyaneer, an Australian consultancy firm [35,36]. IFRC conducts this study before and after the implementation of its development programs. Framework of Resilience Star and resilience Radar are applied in this study with certain modifications. They are explained below.

**Resilience Star:** It is a participatory tool that is used to produce, consolidate, and analyze information about a community's vulnerabilities, capacities, and risks along the six features of the IFRC community resilience framework. The data is presented visually as well as in tabular form. Data collection for resilience radar is an interesting process that encourages the community's participation and ownership in the process.

The star is used to recognize and relate capacities and susceptibilities to stresses and shocks for all six resilience characteristics. It also summarizes, triangulates, and discerns information regarding vulnerabilities and capacities from the secondary data that is already available in the literature on the topic or a specific geographical area. It also derives the information from primary data collected from a group of residents through individual interviews, focal group discussions, and participant observations.

**Resilience Radar:** Resilience radar is another IFRC survey-based tool of Banyaneer. It measures the resilience level of a community or a social group. It is mainly designed and used by development

**Table 1**  
Sampling Framework.

Sampling framework summary Sampling size: 200				
Key Information: Confidence Level 96% - Margin of error: 4%				
Community	Population	Sample size	Sampling interval	Duration
France Colony	8000	200	40	2 months

professionals to monitor and evaluate a development project before its inception or measure its impacts afterward. The ten indices are measured on a scale from 0.0 to 1.0. They are the inherent processes and outcomes of resilience indicating how a community is strong or weak against internal and external shocks. They are measured using a survey sheet. Responses from the sheet are turned into numerical values for measuring resilience.

Since the radar measures several dimensions, therefore, it can identify strong and weak areas of a community and also provides a window of opportunity for the policymakers and professionals to prioritize their plans according to the survey findings.

There is an ongoing debate on defining and measuring resilience and incorporating indicators into the radar. Therefore, different aspects have been taken into account in different situations and community settings by various organizations and development professionals for measuring resilience. Banyaneer focuses on social capital, connectedness, and general community capacity among other elements on its radar as they appear critical to the survival of a community against disasters. We amended the original radar by excluding natural resource management. Our reasoning is based on the non-availability of flora and fauna within and around the settlement.

Another, prominent exclusion from the original radar was made in the questionnaire section, which appeared to be too long. We edited or removed several unrelated questions to make them more contextual and deeply meaningful for the research locale.






**Radar Chart Interpretation:** Radar has 9 radial lines. Each one of them represents indicators as measured through a survey sheet. Four blue and five green circles against each radial line represent processes and outcomes of community resilience respectively (Table 2).

Each indicator has an index value between 0.0 (minimum resilience) to 1.0 (maximum resilience). Minimum falls at the center of the circle whereas maximum abuts at the border of the radar. The following table summarizes the index score.

**Calculating Index Values:** Almost all questions in the survey questionnaire have five options. They range from strongly agree to strongly disagree. Respondents are asked to mark any one of the option choices. For converting them into an index, each option is assigned a universal ascriptor from 0 to 1 with an equal interval in between. Irrespective of answer options, ascriptors are assigned on an identical pattern to maintain uniformity, ease of understanding, and calculating the index. The following table summarizes the ascriptor values and their calculation (Table 3).

Percentage column values are derived by calculating the percentage of respondents who marked the respective option. Values for the score column are derived by multiplying the percentage with the ascriptor value. At the end, scores are added and an average of all questions is derived for calculating the index for each indicator. The responses from the questionnaire sheet are transferred to the data analyses sheet to derive the index values for each of the 10 indicators or 9 indicators in this case.

**Table 2**  
Index Score Chart.

Color ring	Index score	Interpretation for resilience
	0.81 – 1.00	Very high
	0.61 – 0.80	High
	0.41 – 0.60	Medium
	0.21 – 0.40	Low
	0.00 – 0.20	Very low

**Table 3**  
Index Calculation.

Example	Responses (%)	Value	Score
My community has effective leaders			
Strongly agree	20.8 %	1.00	0.208
Rather agree	10.2 %	0.75	0.076
Neither agree nor disagree	1.0 %	0.50	0.005
Rather disagree	31.0 %	0.25	0.077
Strongly disagree	37.1 %	0.00	0.000
Score (max 1.00 – min 0.00) calculated by adding all values underscore column			0.367

#### 4.1. Measuring community resilience

The following sections describe the results of France's colony resilience through the IFRC Resilience Star and Resilience Radar.

**Resilience Star:** We engaged 16 France colony residents to share their experiences and knowledge about top hazards and threats. They have an equal share of men and women. We divided them into two segregated groups for focus group discussion. Main threats to the community such as flooding, earthquake, and drought were already identified through previous visits. They were the main areas under discussion and dwelled upon considering the severity of the changing climate in South Asia and Pakistan.

An outline of the resilience star was sketched on a notebook. Six lines were drawn. One for each (resilient/vulnerability) characteristic. Subsequently, we discussed every feature with each group of participants. Discussions continued till the concept was clear to every member. The conversation provided valuable insights about the timing and intensity of flooding, people's coping capacities, and their ability to evacuate the vulnerable members of their families.

This exercise was repeated for each hazard to identify their respective capacities and vulnerabilities. Finally, results were compared, and differences aligned for data collected from each group. We consolidated and presented the results in Resilience Star as presented below (Fig. 1).

The above diagram depicts more capacities under certain sections with greater vulnerabilities under other heads. Such susceptibilities may be addressed by the policymakers as they have been further emphasized under the head policy implications.

**Resilience Radar:** The following table and figure explain the vulnerabilities and strengths of a community through radar generated after extensive data collection and analysis procedure as explained in the methodology and theoretical framework sections (Fig. 2 and Table 4).

Nine main indicators were measured against the baseline index from 0.0 to 1.0. The former digit denotes the least community resilience whereas the latter indicates the highest possible resilience against a certain threat as covered in this study. Social capital, inclusiveness, and connectedness are all closely associated indicators. They rely on people's linkages, associations, and assistance in emergencies. In these three indicators, values are very high for France colony. This implies that the colony residents are resilient and they can rely on support from their neighbors or acquaintances.

Disaster risk reduction scored very poorly in this radar chart which is mainly led by poor disaster awareness and people's dependence on the mercy of nature. Even during interviews and FGDs, people responded "If God wills, no disaster can harm them". Their belief aside, preparations against adversities are cardinal for resilience building in a society. Unfortunately, it is badly missing for France colony. Nevertheless, NDMA is significantly active and is adequately equipped to deal with emergencies. However, its response effectiveness can be further bolstered if residents are also made mindful of their roles and if their capacity is enhanced through awareness, education, and technical support.

The water and sanitation indicator, though, has a reasonable score and does not reveal the real situation on the ground. The area has heaps of garbage and filled drains with solid waste. It is in stark contrast to the adjacent sector F-7 and most of the other developed sectors of

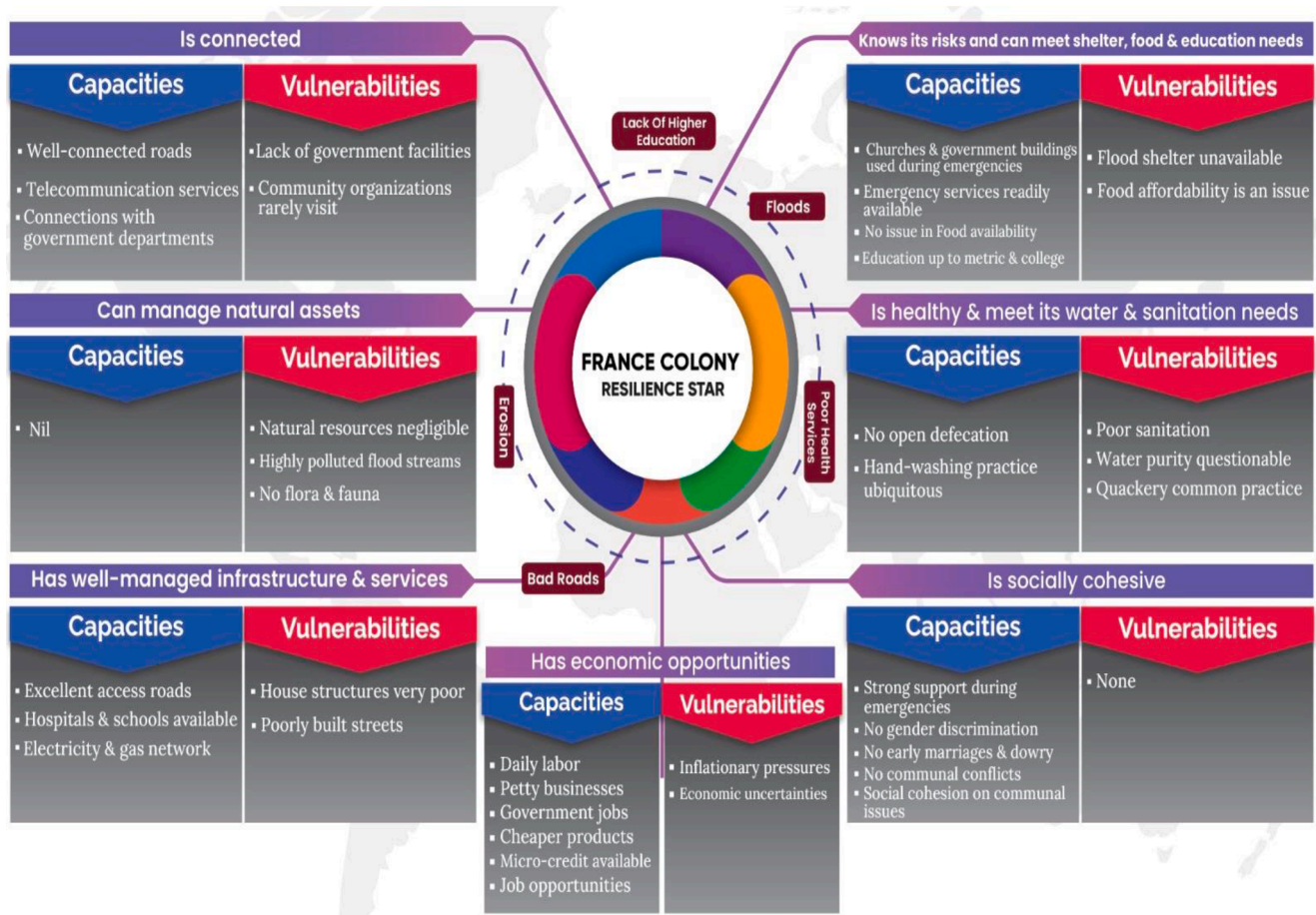


Fig. 1. France Colony Resilience Star (Source: Diagram by authors).

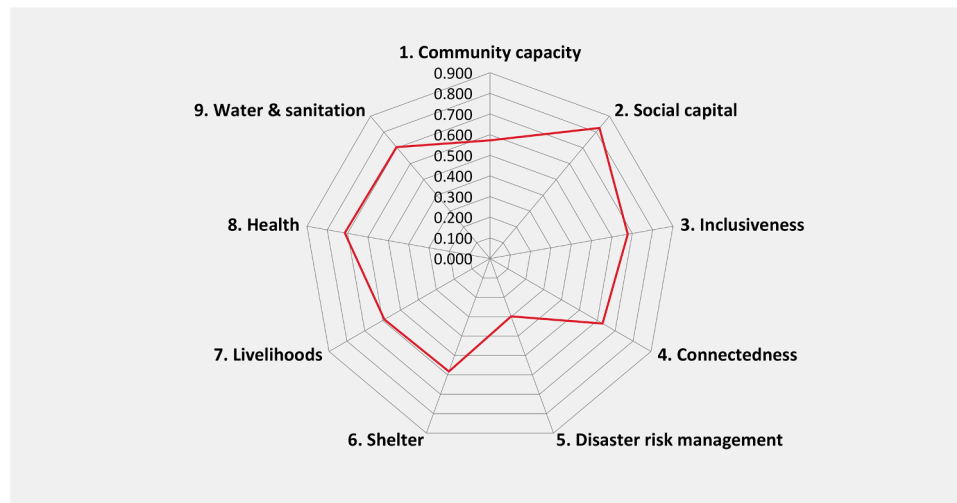


Fig. 2. France Colony Resilience Radar (Source: Diagram by authors).

Islamabad. France colony needs the utmost attention of the authorities. Poor solid waste management may lead to catastrophic situations in case of heavy rains leading to flooding, or fires.

Shelter is a crucial indicator in this resilience radar. Originally, it was designed to be measured through two main elements. These were “safe shelter awareness” and “safe shelter practice”. Banyaneer itself admitted that “safe shelter practice” is more important than “awareness”. It believes awareness is of little use if it does not translate into a meaningful

application. We also agree with this fact and consider “safe shelter practice” for measuring resilience only. In this element, personal observation was also considered very important as those of the responses received from the respondents. However, it has not been quantified in this indicator.

The other two indicators, i.e., livelihood and health, etc., are self-explanatory in the chart. They have reasonably resilient scores mainly driven by the colony’s location in the center where jobs and health



**Table 4**

France Colony Resilience Index (Source: Table by authors).

Surveyed Locality	Index values	Name of Survey Locality: France colony
1. Community capacity	<b>0.572</b>	<b>Summary of data collection</b> Close-ended questionnaires from 200 participants were collected through soft and hard copies. Data was transferred to a customized data analysis sheet, originally developed by Banyaneer Consultancy.
2. Social capital	<b>0.826</b>	
3. Inclusiveness	<b>0.678</b>	
4. Connectedness	<b>0.630</b>	
5. Disaster risk management	<b>0.299</b>	<b>Key observations of the chart</b> The overall average resilience index of 0.622 is higher than the median value of 0.5. Social capital has a very high value mainly driven by close association and linkages among the residents. Disaster risk management has a very poor score, which needs greater attention
6. Shelter	<b>0.582</b>	
7. Livelihoods	<b>0.591</b>	
8. Health	<b>0.714</b>	
9. Water & sanitation	<b>0.704</b>	
Average	<b>0.622</b>	

facilities are abundant and closely available for most of the residents. These two indicators also make a significant contribution in pushing the overall resilience above the median value, which is positively influenced by social capital and health.

#### 4.2. Transect walk results

A transect walk was conducted before starting the primary data collection through interviews and focus group discussions. The results of the walk are described in this table (Table 5).

#### 4.3. GIS analysis

The following map illustrates the dreadful situation of the study area i.e., France Colony. Unlike, the well-planned and developed areas of established sectors, this residential compound is a black spot in the city center. It has grown and occupied every inch of the space available on both banks of three depressed drains passing through sector F-7. Thousands of tiny double and triple-story houses abut and overlap each other on the ground floor and first floor in a densely built neighborhood. Worst of all, France colony houses accommodate almost triple the number of inhabitants than those living in adjacent bungalows. This aspect is a big cause of concern and little has been done to address it (Fig. 3).

As shown in the following map, the colony is highly vulnerable to floods. The map shows that in 2022 the colony faced inundation due to overflowing drains passing through the area. As vividly seen floodwater submerged the entire locality for a short time during which residents suffered serious losses. This situation develops due to the reason that water from upscale and elevated areas enters the colony from three directions and wreaks havoc on the houses. Poorly constructed houses in the colony suffered damages whereas people endured serious financial losses (Fig. 4).

**Table 5**

Transect Walk Results.

Type of Ground	Sloppy land / Flood streams passing through the settlement
Livelihoods	Daily wage and low-scale government jobs, laborers,
Risks/hazards	Water contamination, mosquito breeding, open drains, vulnerable buildings
Vulnerability conditions	Sloppy ground, high-pressure streams during monsoon, congested living
Beliefs and values	Christianity, churches, close-knit society, socially cohesive
Capacities	Road access, young population, city center, easy accessibility to health, education

#### 4.4. Socio-Economic characteristics

We conducted a quantitative survey of French colony to analyze the socio-economic characteristics of the residents. The data summarized in the table below reveals that the people of the colony face poor socio-economic conditions (Table 6).

**Dependency Ratio:** The data set reveals that French colony residents have a severe dependency. Only 18 % of the residents have either a job or are self-employed. Around 25 % of the people are either partially employed or receive some kind of pensionary benefits. The majority, i.e., 57%are highly dependent.

**Literacy Rate:** Although the literacy rate of 69 % in French colony is higher than the national average of nearly 55 %, the locality's dropout rate is quite alarming.

A mere 18 % of the total population reach the intermediate level whereas a meager 3 % enroll in a university. This painful situation persists even though affordable education is available within the colony's vicinity and in Islamabad.

**Household Monthly Income:** Poverty is also one of the reasons for these people to live in shambolic and vulnerable homes alongside the filthy drains. Only one or two individuals earn to sustain their large families. Their level of income is also small compared to average income in Islamabad. Almost 80 % of the people earn less than the minimum wage of Rs. 28,000 (\$78) as fixed by the government.

The table shows that 57 % and 23 % of the households have monthly incomes of Rs. 15000 (\$52) and Rs. 25000 (\$90) or below respectively. It is very difficult for these people to make both ends meet considering the very high inflation. Only 16.5 % of the people have a respectable income of up to Rs. 40,000 (\$140) and a mere 3.5 % have an income of Rs. 40,000 (\$140) or above. With this low-income people can only live in tiny and dilapidated structures, and they can hardly afford higher education.

**Availability of services:** Availability of utilities and other services for French colony residents is also a major concern. The main issue is the non-availability of healthcare facilities for the colony residents. Consequently, they face several health issues. The obvious reason is the congested and untidy living conditions where they breathe and move around, thus increasing the chances of spreading viral infections.

Data says that nearly 53 % and 37 % of the people have access to a health and antenatal care facility respectively. Such facilities are limited to the government hospitals where they get their medical check-ups and early diagnosis.

**Family Size and Gender Ratio:** As stated earlier, French colony residents have big families and huge gender disparity. Most of the households have on average seven family members living in 2-bedroom houses. Since families are large and females have higher life expectancy, the proportion of female to male proportion is significantly disproportionate. For instance, there are 1.35 females against 1 male in French colony. This situation makes the entire family vulnerable.

#### 4.5. Resilient characteristics

French colony has some unique features that meet globally standardized urban characteristics such as mixed-use and dense urban agglomerations. These qualities are badly missing in most of the upscale localities of Islamabad. For instance, Islamabad is an expansive city with separate residential, commercial, educational, and industrial areas. Residents have to travel long distances for jobs, education, or shopping. This makes their everyday commute expensive and exhaustive.

French colony has several basic facilities such as primary schools, grocery shops, churches, and even dispensaries within its precincts. Most of the people also work in nearby commercial area. The colony is also quite dense. A large number of people live in a compact environment, which is a preferable mode of living in modern cities to keep spaces open for parks, playgrounds, and wide roads. Some of the colony's positive features are described below.

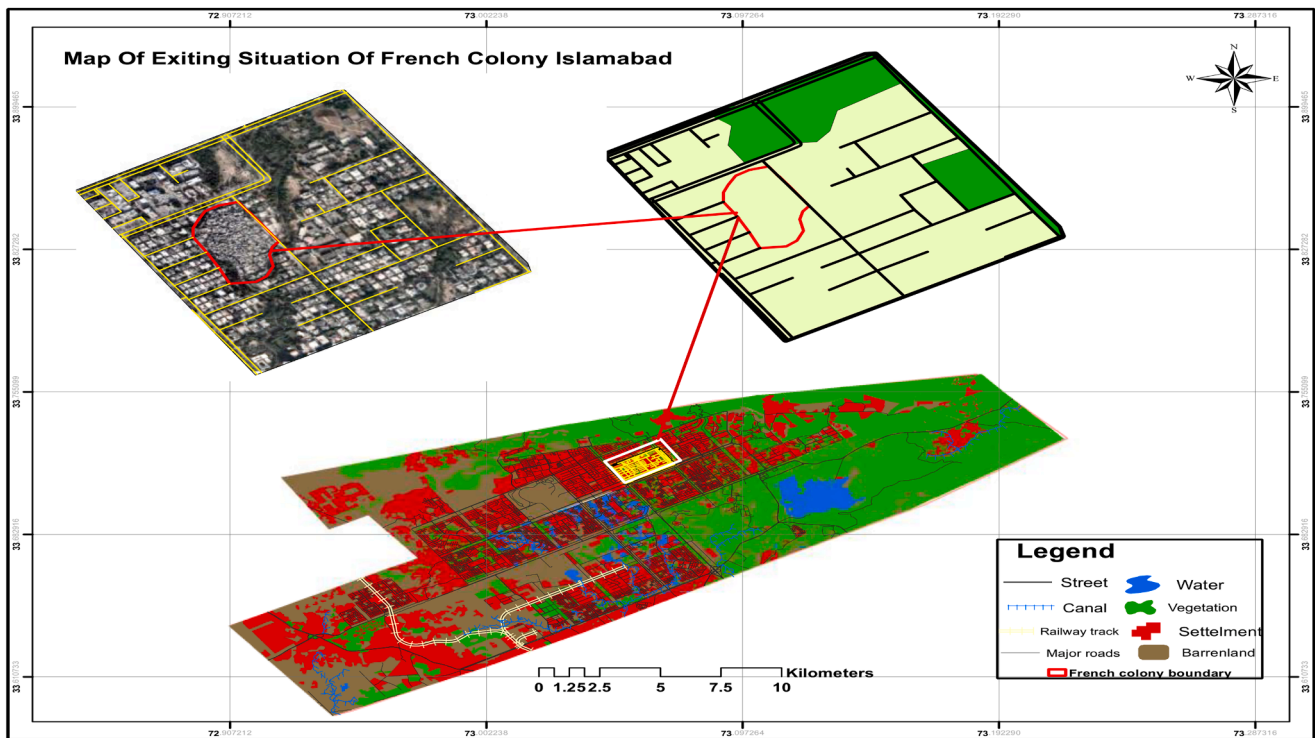


Fig. 3. French Colony Surrounded by Developed Sector F-7.

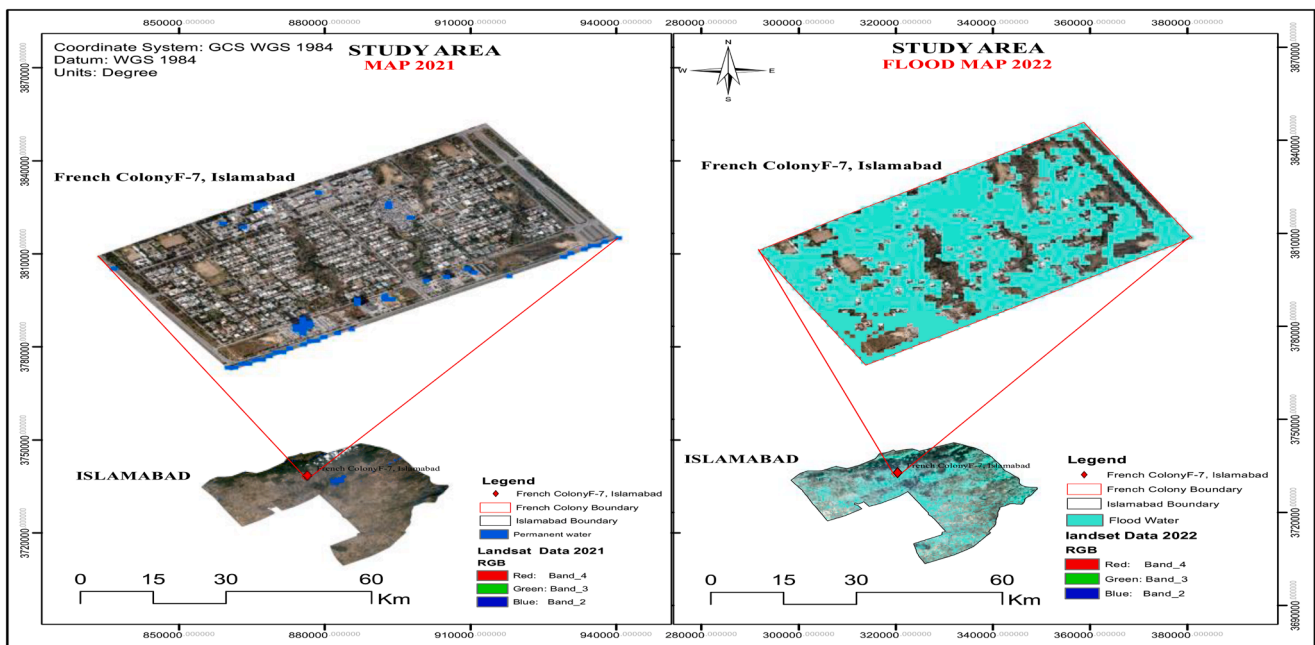


Fig. 4. French Colony Flooding.

#### 4.5.1. Social cohesiveness

Social cohesiveness and connectivity are vital for building community resilience. Religious places such as churches and mosques are usually the sites for improving connectivity and cohesion. People use these sites for following religious rituals, mourning, and festivities. Moreover, old and new generations bond and share cultural and religious values at these locations.

People of French colony apprised the author that around eight churches exist at the settlement where residents sort out their communal

issues. Some of them were markedly visible with their cross symbol. One large Church, namely “The United Prayer Fellowship (UPF)” was also located astride Street 54 which welcomes the worshippers from across the city. A large open area in front of the Church is also used as a site for establishing a marque for communal events such as marriages and deaths. Moreover, these sites also act as places for self-reflection and spiritual growth. This is where community leaders are groomed, make decisions, and resolve their disputes. Hence, these religious sites are ideal locations for connection and cohesiveness where people knit

**Table 6**

French Colony Dependency Ratio (Source: Table by authors).

Sr. #	Socioeconomic Characteristics	% age
1.	<b>Dependency ratio</b>	
	Low	18
	Medium	25
2.	High	57
	<b>Education level</b>	
	Uneducated	31
	Primary education	25
	Middle education	23
	Matriculation	10.5
	Intermediate	7.5
3.	Above intermediate	3
	<b>Monthly income</b>	
	\$52 & below	57
	\$52 to \$90	23
	\$91 to \$140	16.5
4.	Above \$141	3.5
	<b>Services Availability</b>	
	Access to a health facility	53
	Antenatal care	37
	Overcrowding (people/room)	3.93
	Electricity	90
	Sanitation	51
5.	<b>Family characteristics</b>	
	Family size	6.7
	Female to male ratio	1.35

closely together.

#### 4.5.2. Mixed-Use urbanization

A very prominent and promising feature of the colony is that all life necessities are available within walking distance. These include grocery shops, a primary school, offices, workshops, a medical store, a tailor, a beauty parlor, and a meat shop. This aspect makes it a viable and sustainable place.

It is in contrast to the rest of the city where only Markaz (center) in each sector can provide such facilities. The residents, therefore, have to access them through their vehicles or take long walks. In French Colony, people are not required to travel far away for their everyday needs. It is a perfect example of a compact and sustainable city [37].

#### 4.5.3. Health and education

Health and education have also been reported satisfactory. When a resident was asked if the government had ever offered her a better and safer place to relocate. She replied in the affirmative and added that her community members were unwilling to move for the reason that they live in the city center and are close to health and educational facilities. She said the city's biggest public hospital PIMS is very close to their colony. If anyone gets sick, they can easily shift him/her to the hospital. If they relocate, they might not be able to access the hospital due to financial and logistical constraints.

Another resident said that all his kids went to the nearby government school which was quite convenient. However, he said that their kids did not take an interest in their studies because they believed going to school was a waste of time and resources. The government jobs come on money and reference. Since they were poor and did not have references, therefore, they would never get any good government job. Nevertheless, the colony's ideal location within the center of the city makes it an attractive place for its residents. Despite several other challenges, they are adamant about living there to get access to health, education, jobs, and easy mobility.

#### 4.6. Vulnerabilities

Being a poor neighborhood, the colony faces many urban, climate change, and socio-economic challenges. Some of them are listed as under.

##### 4.6.1. Connectivity and emergency services

Several streets of the society are connected with the surrounding main arteries. Residents use these routes to access markets and go around for everyday chores. They are also used for emergency evacuation. However, these streets are very narrow and uneven. Vehicles cannot pass through them, let alone ambulances or fire-tenders. Hence, it is difficult for residents to evacuate the vulnerable in emergencies. Similarly, during floods or in case of an earthquake, damage to one house or the wall of a house may block the adjacent street. This may hinder evacuation. This aspect needs to be taken into consideration by the city government while planning the evacuation plan or conducting emergency drills for the inhabitants. After all, it is responsible for the safety and evacuation of residents in calamities.

The data reveals that city administration may not have ample emergency personnel, equipment, or other resources to serve an entire sector, let alone the whole city. Moreover, French colony being highly congested with extremely narrow streets, is impenetrable for extinguishing an inferno, or evacuating the trapped. A senior officer of NDMA said that the organization usually procures resources from the nearby Rawalpindi and also assists the city in time of need. Hence, extreme emergencies may create a chaotic situation for the colony residents.

##### 4.6.2. Building code violations

It was observed during the visits and confirmed by the residents that the CDA building wing never monitors the area. Therefore, building code violations are ubiquitous. Almost all the concrete structures are haphazardly built and then retrofitted to accommodate expanding families. Street-abutting rooms have been converted into shops whereas additional stories are built without any regard for structural strength. These houses can be death traps during earthquakes as they may not bear even minor jolts.

There must be a semblance when it comes to raising concrete structures. These buildings can either be strengthened to withstand disasters or they can be replaced with light construction material so that they are not dangerous to their inhabitants. A group of respondents apprised the researcher that almost all structures are built without mandatory beams and columns, which are essential to make such structures safe from earthquakes and other disasters. One very serious building code violation observed during the transect walk was the expansion of the first story of a house on a narrow street on both sides thus preventing sunlight and ventilation in the streets.

##### 4.6.3. Sanitation and open drains

Several big and small drains converge at and pass through the colony. Three of them are big and extremely dangerous. These deadly drains carry sewage water from the colony. It was noticed that these drains are deep and unusually narrow. Over time, people have encroached upon their banks by expanding their homes thus reducing their width and carrying capacity. To make matters worse, these drains have also lost their depth due to the accumulation of silt and solid waste. Ignorance or non-availability of solid waste management practices in the settlement has left no choice for people other than drains to dispose of their waste. The stench from them enters into the houses while also endangering the lives of kids playing in the streets (Fig. 5).

A participant revealed that one gory incident happened in heavy rains of 2022 when a teenager drowned in one of these drains while crossing a bridge. A gushing wave of flood from upstream took him away. His disfigured body was found downstream in Nallah Lai several days later. A few other children have also lost their lives in the past while playing at the banks of these drains which have no barriers as is evident from the above picture.

Such informal colonies face common urban problems such as poor waste management and environmental degradation. The reason is that protecting and cleaning up urban areas rarely results in immediate political gains. Political governments normally prioritize infrastructure, and water supply projects, which further exacerbate urban





Fig. 5. Stormwater Drains (Source: Picture by authors).

environmental problems such as wastewater into open drains [38]. In short, there is no government ownership or management of the area for the provision of sanitation services.

#### 4.6.4. Socio-Economic safety nets

Wise people save for rainy days. They manage their finances by insuring themselves, their homes, and families. Socially they also develop their networks. People reciprocate by helping their neighbors, relatives, or close acquaintances in emergencies. These aspects were carefully covered during individual interviews as well as focal group discussions.

One surprising fact emanated from the discussions was that although people have no economic security, their social safety net was very strong. For instance, all respondents confirmed that they do not have any kind of financial insurance. However, almost everyone expected to get assistance from their neighbors and acquaintances for rescue. People are closely knitted together. Having lived very close for decades, almost everyone knows one another. It is conventional for these people after rains to venture out immediately and inquire about the safety and security of their immediate neighbors and close relatives.

When asked if they expect any outside assistance in times of crisis. They wondered who could help them other than their neighbor or relatives. It means they do not expect any assistance from the government or any other philanthropic organization.

#### 4.6.5. Poor water and electric services

Municipal services are nearly non-existent in the colony. Interviews and transect walks confirmed that water supply is a serious issue for the residents. The colony does not get any water from CDA supply lines. To meet their requirement, most of the residents have either drilled their boreholes or installed one in collaboration with their neighbors. They use groundwater for all purposes including drinking, cooking, bathing, and washing. As they live on a stream, which is now an open drain, groundwater must have been seriously contaminated. Consuming this water for drinking and cooking may jeopardise their health.

Similarly, the electric supply network is also one of the black spots of the colony. Houses have haphazardly connected electric wires. Most of the cables were passing in narrow streets at the head height. Such electric connections were quite a threat to the children playing in the streets. They may also cause fire incidents due to short circuits (Fig. 6).

Residents apprised that meter readers visit their homes for taking readings only. They do not repair their connections or improve the supply system. People get connections on a self-help basis. Doing so can be dangerous, especially during the wet season when chances of electrocution are high.

#### 4.7. Vulnerable groups and resilience opportunities

A community like France colony can have several inherent vulnerabilities. They depend upon gender roles, level of income, belongingness to a minority group, having a disability, being migrants, or having attained old age. These groups of people can have their vulnerabilities turned into strengths to make the entire community resilient to shocks. The following table categorizes the people based on their vulnerabilities and then identifies the areas where they can be turned into strengths (Table 7).

The idea in the above table was taken from a report titled Road Map to Community Resilience developed by IFRC Societies, Geneva. However, it has been significantly amended and information included from the primary data collected from France Colony, Islamabad.

## 5. Conclusion

Rapid urbanisation has created several challenges for urban planners and municipal governments. Climate change has exacerbated these challenges as it has started to take its toll on the haphazardly built environment in Pakistani cities. Rapidly expanding metropolises have failed to accommodate the influx of poor and marginalised people. When unable to find suitable homes, these people begin building weak



Fig. 6. Dangerous and Open Electric Connections (Source: Picture by authors).



**Table 7**  
Inclusive Resilience Building [39].

Group	Vulnerabilities	Resilience opportunities
Female	Limited access to education & information Economic dependence Inability to anticipate & recover from disasters Poor representation in risk governance	Based on their reproductive, physical & economic vulnerabilities, women may give different insights about risks Women's roles at home, community & society are well-entrenched. They know communal dynamics more than their male counterparts Women's inclusion in resilience-building & risk governance will be beneficial for the entire community Less resourceful can be valuable for the community
Low-income group	Ill health Lack of credit Lack of mobility	Their skills, vulnerability perspective, and physical & social power may be used for building community resilience
Minorities	Inaccessibility to information & services Linguistic, cultural & political barriers	Open & willing to be inclusive Ready for resilience-building initiatives
Disables	Physical inaccessibility to services & information Unable to evacuate during disasters Hindrances to mobility	Disables have unique skills & abilities They can easily & quickly learn risk-reducing skills They are attentive, motivated & capable They know better others' vulnerabilities Can be valuable for risk assessment
Migrants	Socially disconnected Lack of traditional safety nets Lack of safe shelter Unable to understand local languages such as radio, TV, etc.	Migrants bring outside knowledge & experience Their knowledge can help prepare resilience plans Their inclusion adds valuable diversity to resilience-building efforts
Seniors, Children	Excluded from decision-making & public policies Unable to get & understand the required information Dependence makes them prone to violence	Seniors have extensive experience & traditional knowledge Youth have energy Both have ample time

structures on the banks of stormwater drains, open areas, and city peripheries.

French Colony in Islamabad is one such informal settlement, which has grown from a few hundred residents to thousands of families living in an extremely dangerous location within the city center. This colony is not on the priority list of the CDA or the Islamabad municipal government. Locals themselves have procured the services, built shambolic homes, and helped one other in times of crisis.

As climate change has started to manifest its impacts in Pakistan, the residents of this colony may not stay safe from emergencies. Some basic and affordable actions can be taken to build the resilience of the colony. These include clearing stormwater drains every year before the onset of monsoon season and providing municipal services. These interventions can make the neighborhood a sustainable place for its inhabitants.

#### CRedit authorship contribution statement

**Latif Abdul:** Writing – review & editing, Writing – original draft, Validation, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Taofang Yu:** Writing – review & editing, Supervision. **Muhammad Yousif Mangi:** Software, Methodology.

#### Declaration of competing interest

We, the authors, declare no conflict of interest with the city, its organisations, the respondents and any other body, whether directly or

indirectly regarding the research undertaken and paper submitted to journal “Sustainable Futures” for publication.

#### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.sfr.2025.100862.

#### Data availability

Data will be made available on request.

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