Analysis

Preliminary Analysis (July 2014)

The megacity of Kolkata is located on the east bank of river Hooghly, at the tail end of river Ganga, approximately 180 km away from Bay of Bengal, with an average elevation of 9 meters above mean sea level. Kolkata city has a very high density of population (approximately 24,000/sq.km).

As a first step towards understanding existing climate change, the mean monthly rainfall for Kolkata was obtained from the IMD. The sixty-year long term data (1949-2009) was grouped into two subsets (1949-1969 and 1969 -2009). Figure 1 presented below shows the increasing long term average rainfall on the one hand and increasing variability on the other based on the assessment of two long term periods. The preliminary analysis indicates the increasing vulnerability in terms of extreme weather events and also exposure to risk factors.

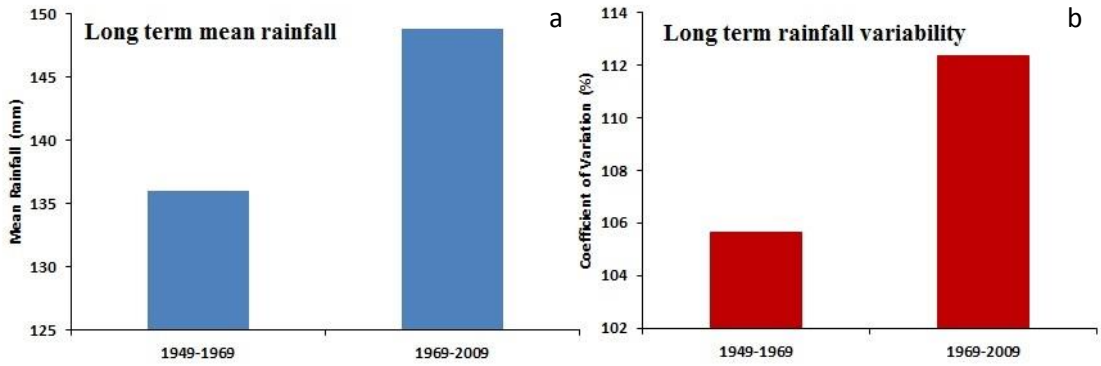

Figure 1a: Represents long term monthly mean rainfall for Kolkata, 1b: represents long term rainfall variability [Source: www.imd.gov]

A study by the World Bank (2010) identified 12 wards bordering Ganges River and in the eastern part of the city as highly vulnerable (Figure 2).

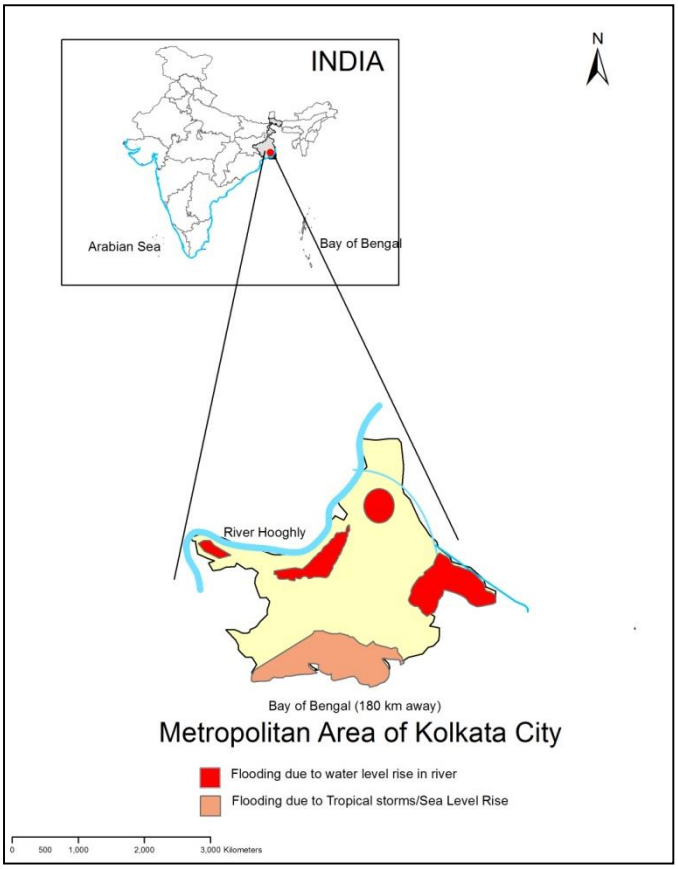

Figure 2: Flood prone areas of Kolkata

Figure 3 presents the wards which are identified as vulnerable to flood. It is estimated that 11.03 percent of the total population of Kolkata reside in these wards.

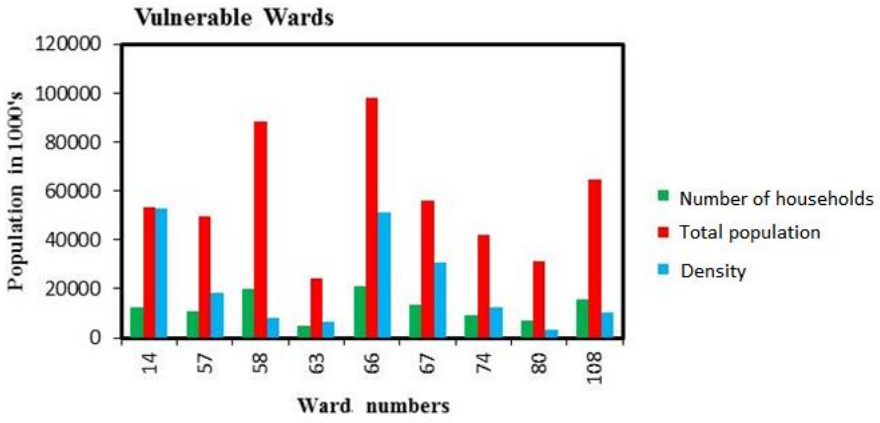

Figure 3: Vulnerable population in the flood prone wards

Figure 4 represents the percentage change in population from 2001 to 2011 along the flood prone vulnerable wards. Except for Wards 80 and 63 which show declining population density in the last decade, in all other wards there has been increase in the density of population ranging from 5-70 percent.

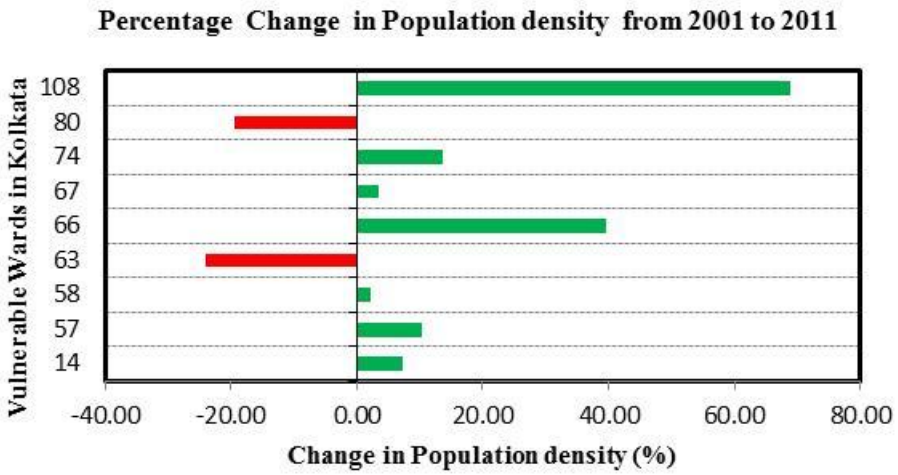

Figure 4: Changing population density in the vulnerable wards

In the case of social development in the vulnerable wards, two parameters namely the literacy level (represented by the proportion of total literates to the total population of a ward) and worker participation rate (represented by the proportion of total workers to the total population), were selected to indicate the overall development. Nine combinations of wards based on their levels of literacy and worker-participation were identified (Table 1).

Table 1: Number of wards vulnerable to climate change based on social development indicators

Literacy Level	Worker Participation Rate	Number of Wards	Number of Climate Change Vulnerable Wards*
High	High	3	0
Moderate	High	25	1
High	Moderate	26	0
Low	High	8	0
High	Low	7	0
Moderate	Moderate	33	3
Moderate	Low	11	0
Low	Moderate	10	3
Low	Low	18	2