

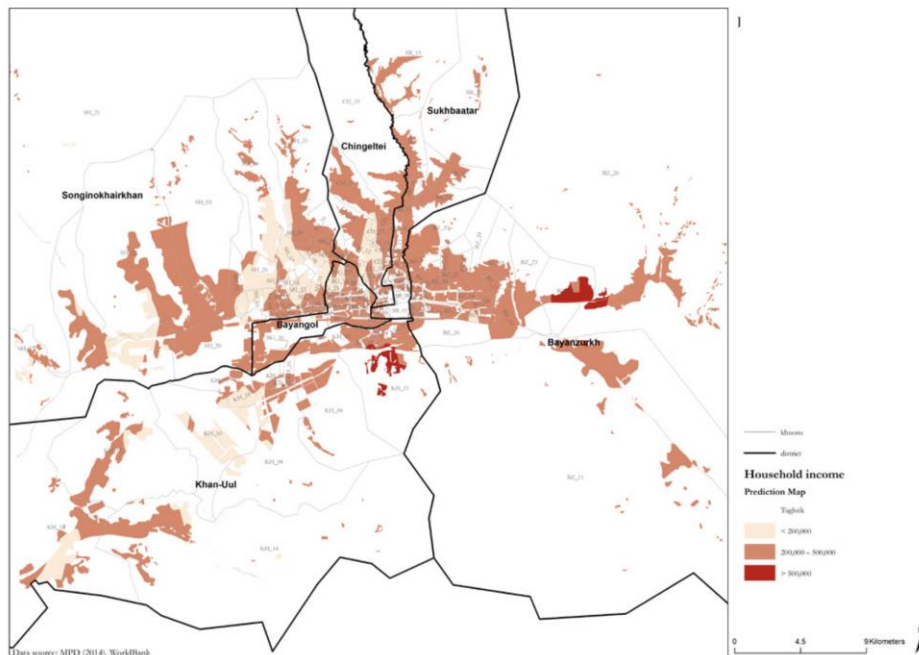
Case Description for Ulaanbaatar, Mongolia

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1. Who is the group most affected by the problem? Key stakeholders

People living in the Ger District in Ulaanbaatar (GDUB) constitute 60% of the city's population, estimated to be about 800,000 people, 27% of the country's population [1]. Household income in GDUB is generally around 200,000 Mongolian tugrik (~70 USD) per month [2], see Figure 1.

City ger residents are often recent migrants who moved to UB looking for employment opportunities. A typical household is 4-8 people living in one ger. Many gers are connected to the electric grid and about 60% have internet access. Some households also use electricity to heat their gers, which is significantly more expensive. Most of them only use it at night or during other times when it is subsidized by the government. 20-30% of GDUB residents often carpool [2].



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Figure 1. Map of Ulaanbataar by household Income. Taken from [1].

2. What are the adverse effects of the problem on our group?

- GDUB residents suffer adverse health effects from living in a polluted environment. [3]
- GDUB residents spend up to 40% of their monthly winter income on heating fuels [4].
- Each week, many GDUB residents spend a significant amount of time and car fuel on picking up coal for self-use in the ger [5].

3. Where does the problem occur? Physical and/or virtual spaces and locations

Gers

Figure 2 shows a ger and its surrounding neighborhood. Neighboring gers are located on separate tracts of land, separated by fences. Each ger has its own yard. During the day, fences may be locked, which means that deliveries of any kind would be left outside by the fence [6].



Figure 1: Dwelling on the edge of the ger districts; open pasture still crested the hills of Ulaanbaatar in 2000.

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Figure 2. A Mongolian yurt, called a ger. Taken from [6].

The Door is used as the main point of entrance in ger (see Figure 3). Door dimensions are generally around 165 cm x 147 cm x 10cm (5'5" x 4'10" x 4"), One of the customs around ger forbids frowns on physical interaction with structural elements of the ger such as the door frame [6].



Figure 3. Mongolian Ger Door and Door frame. Mongolian Ger doors are rather small. Taken from [6].

Refined coal distribution centers

GDUB residents travel to the refined coal distribution centers, where they pick up their weekly supply of fuel [5]. Most people use cars to transport the fuel from the distribution center to their gers. In limited cases, people may bring coal by foot with a cart/dolly if they live near the distribution center. Then, the bags are stored outside until they need them in ger. The bags are carried inside of the ger. It is possible to order delivery of fuel directly to your house for extra cost. There are 339 distribution points, and locations are listed [7].

4. When does the problem occur? Events and periods

Temperatures in UB typically drop below the freezing point of water (zero degrees centigrade from October—April [8].

5. Why does the problem occur? Causes, enablers, and triggers

Table 1. Causes and effects of the problem on the most affected group.

Cause (why)	Effect (what) on most affected group (who)		
	<i>GDUB residents suffer adverse health effects from living in a polluted environment.[3]</i>	<i>GDUB residents spend up to 40% of their monthly winter income on heating fuels. [4]</i>	<i>Each week, many GDUB residents spend a significant amount of time and car fuel on picking up coal for self-use in the ger. [5]</i>
Some households who cannot afford to buy coal briquettes sometimes travel outside of the city and buy cheap raw coal (illegal to use/sell in UB), or burn other things, such as trash or wood, to save money [3].	V	V	V
Coal is an affordable heating solution relative to electricity [4,5], leading to its widespread use.	V	V	V
Households with poor insulation may require more fuel [9]	V	V	V
Much of UB's economy is dependent on coal mining and distribution [10].	V	V	V
Once the coal is burned in the stove, it creates a powder that contains heavy metals [3].	V	-	-
The burnt coal powder is gathered and stored outside of the ger, typically against a fence surrounding the property. Poor containment can lead to this powder spreading via wind, being inhaled by children playing outside or by adults doing work [3].	V	-	-
Due to the supply issues in processed coal production supplies are limited, and people must travel at least once a week to buy coal [5].	-	-	V
People often transport the bags from the distribution point to home by car (load in the back seat or trunk) since the distribution points are not always accessible by walk and the bags are heavy (25kg) [12].	-	-	V

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