



UUNUR
COMMUNITY
ACTION PLAN

PLANNING FOR DISASTER RISK REDUCTION IN ULAANBAATOR

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UN HABITAT
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PLANNING FOR DISASTER RISK REDUCTION IN ULAANBAATAR – THE UNUR COMMUNITY ACTION PLAN CLOSING WORKSHOP GUSIP

(Output 6.8)

December 2010

Prepared under:

Citywide Pro-poor
“Ger-area Upgrading Strategy and Investment Plan” (GUSIP)
of Ulaanbaatar City

Prepared under Citywide Pro-poor “Ger-area Upgrading Strategy and Investment Plan (GUSIP) of Ulaanbaatar City, implemented by the Municipality of Ulaanbaatar with technical and financial assistance of UN-HABITAT Regional Office for Asia and the Pacific, and financial assistance provided by Cities Alliance Trust Fund.

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December 2010

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GLOSSARY

CAP (Community Action Planning) – Participatory process through which community members identify problems, generate solutions, and formulate implementation plans for local-level issues such as flood protection.

CDC (Community Development Council) – Group of residents in *khoroos* in *ger*-areas that plan for services, organize savings groups, and participate in GUSIP.

Dzud – An extremely cold winter snow that results in loss of livestock; consecutive *dzud* in the last decade is a primary cause of migration from rural areas to Ulaanbaatar.

FGD (Focus Group Discussion) – An organized meeting between urban planners and community members to share information about an issue.

Ger – Round tent structure that is the traditional housing of Mongolians; migrants to Ulaanbaatar have settled with their *gers*, making it the housing type for 60% of the city's population.

GIS (Geographic Information Systems) – Computer software used to analyze data that is related to a map of a neighborhood, city, region, or other spatial unit.

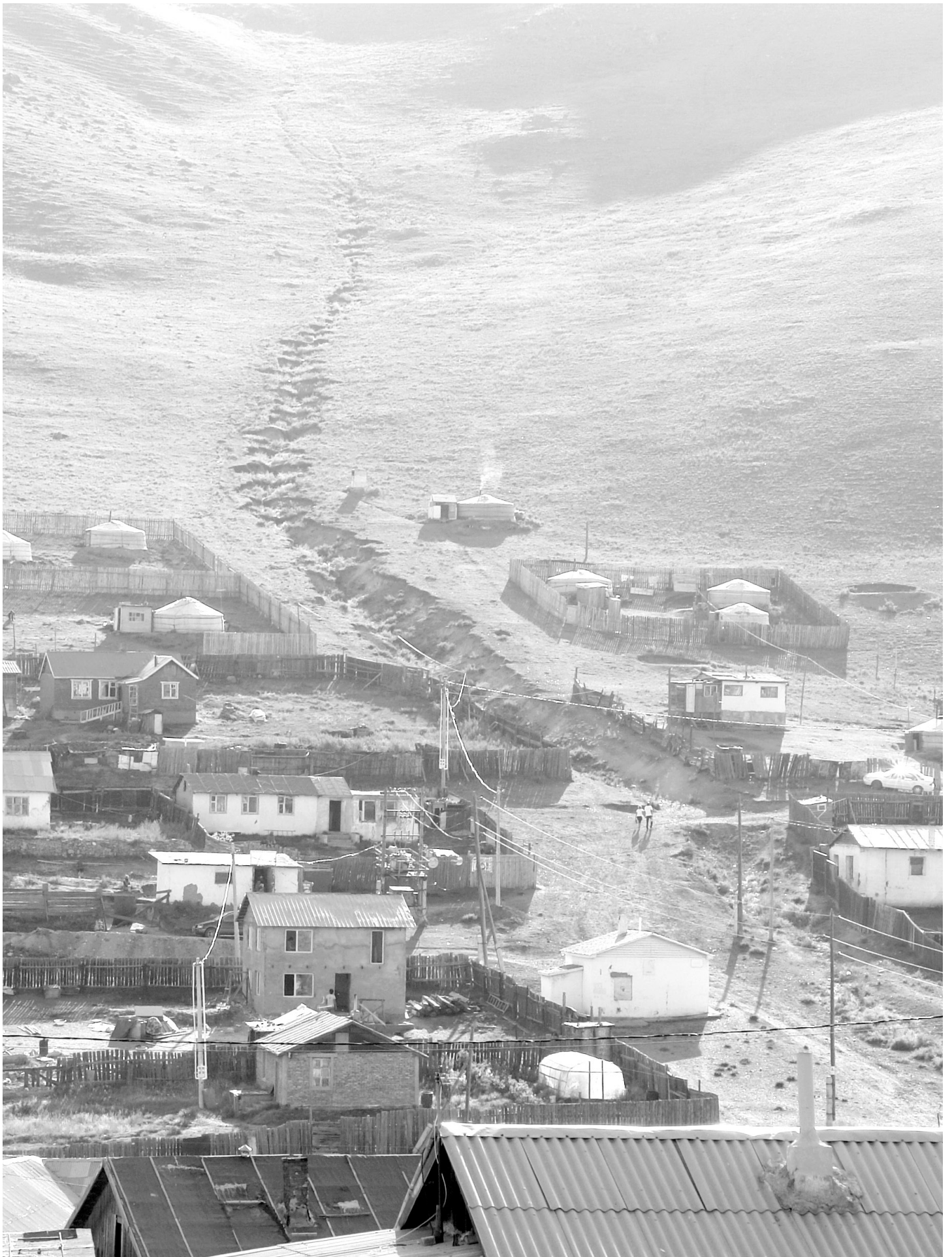
GUSIP (Ger-area Upgrading Strategy and Investment Plan) – Multi-year program by UN-HABITAT and Cities Alliance to facilitate planning and upgrades in five *ger* districts in Ulaanbaatar.

Khashaas – A 700-square meter yard surrounding a *ger* and enclosed by a fence; government policy entitled Mongolian citizens to 700-square meters of land, so this has become the principle spatial unit of settlement in the *ger* areas.

Kheseg – Administrative unit that is smaller than the *khoroos*; many *khesegs* make up a *khoroos* and each *kheseg* has a designated resident leader.

Khoroos – Administrative unit at the neighborhood scale; the Unur area has seven *khoroos*.

UN-HABITAT – The United Nations Human Settlements Programme; the agency is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all.



FOREWORD

The *Ger* areas, where over 60 percent of Ulaanbaatar city's population lives now, are an integral part of the urban social fabric. *Ger* areas pose unprecedented development challenges given their location, low population density and unique urban morphology. Therefore, a strategic development approach is required for sustainable improvements in the quality of life of *Ger* area residents.

The implementation of the Citywide Pro-poor “*Ger*-area Upgrading Strategy and Investment Plan” (GUSIP) of Ulaanbaatar City was led by the Municipality of Ulaanbaatar. The Ministry of Road, Transportation, Construction and Urban Development and the Mongolian Association of Urban Centres were the key national partners of the Municipality. The United Nations Human Settlements Programme (UN-HABITAT) provided the comprehensive technical support for the successful completion of the GUSIP project.

Cities Alliance and UN-HABITAT provided financial assistance for GUSIP. As members of Cities Alliance, the World Bank, the Asian Development Bank, and the Governments of France, Japan, and the Netherlands co-sponsored the project.

The structured consultative process adopted under GUSIP involved key local, national and international stakeholders, and was instrumental in the participatory development of the Citywide Pro-poor *Ger*-area Upgrading Strategy of Ulaanbaatar City. The process included the systematic assessment of development issues in the Central, Middle and Peri-urban *Ger* areas, analysis and adaptation

of various urban upgrading approaches to *Ger* area conditions, and the formulation of *Ger* area-specific strategic options and recommendations. It has contributed to a shared understanding of the problems as well as possible solutions that can sustainably improve the quality of life in *Ger* areas and environmental conditions of the city.

In June 2007, the Mayor's Council approved the Citywide Pro-poor *Ger*-area Upgrading Strategy of Ulaanbaatar City. Following this and in July 2007, the Ulaanbaatar City Citizens' Representatives Council adopted the Strategy for its implementation. Since then, the Strategy has been guiding the design and implementation of national and international programmes and projects for the upgrading and development of *Ger* areas.

The various reviews, guidelines, action plans and toolkits developed under GUSIP constitute valuable contributions to the Municipality of Ulaanbaatar, government organizations and development agencies involved in improving the quality of life and environmental conditions in *Ger* areas.

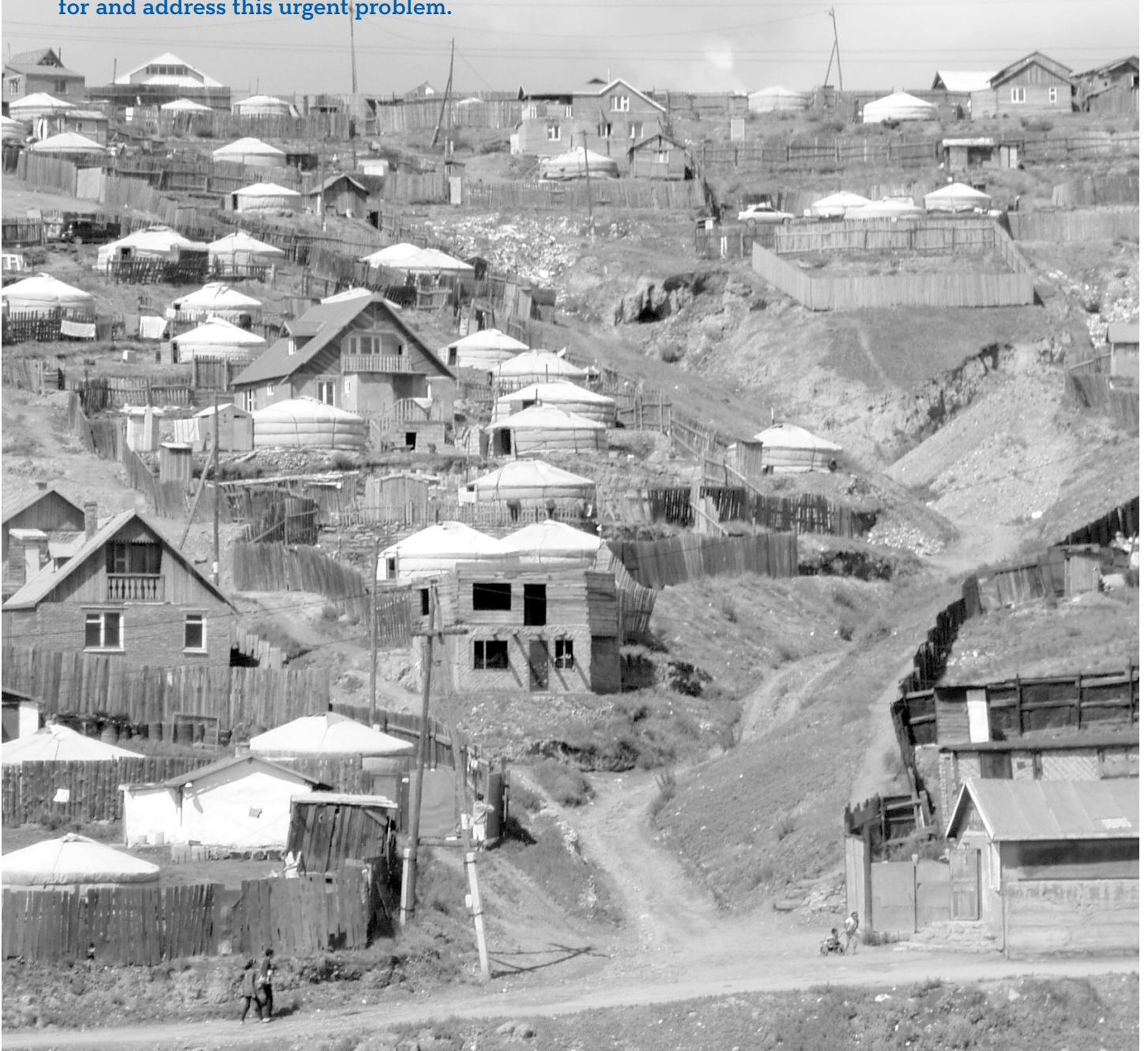
I would like to convey my appreciation and grateful thanks to all our partners for sharing their expertise and sense of vision with us during the design and implementation of the GUSIP project.



Munkhbayar Gombosuren
Capital City Governor and Mayor of Ulaanbaatar

UNUR RESIDENTS ARE PREPARING TO BUILD A STRONGER COMMUNITY.

For many years, residents have lived with annual floods in Ulaanbaatar's ger districts. Fast-paced change in Mongolia and people's need to be near the city center has led many families with few other alternatives to settle in flood-prone gullies. These settlement patterns result in frequent loss of housing, property, and life. On 15 December 2010, 60 Unur residents - with support from UN-HABITAT - began to map out a future with less vulnerability. The resulting Unur Area Flood Protection Community Action Plan demonstrates the people's capacity to plan for and address this urgent problem.



EXECUTIVE SUMMARY

Building Capacity for Disaster Risk Reduction

Since 2005, the formulation of the “Ger-area Upgrading Strategy and Investment Plan” (GUSIP) addressed the needs of residents in Ulaanbaatar’s rapidly expanding ger districts. This report integrates disaster risk reduction with GUSIP’s Community Action Planning for ger-area upgrading.

This Community Action Plan (CAP) underscores that city-wide flood protection cannot rely only on better municipal drains, but must start from small-scale efforts of households and communities. Already, the Unur community broadly knows what can be done to adapt their settlements to flood risks, and it needs support to make many of these small efforts happen.

Since 2005, GUSIP has addressed the challenges of Ulaanbaatar’s rapidly expanding ger districts. The program proposed strategies to redevelop, upgrade, and manage the vast and spontaneously settled areas of the capital city. GUSIP set out a framework for the planning and further development of the central, middle, and peri-urban ger areas. The program also showed that communities in ger areas can organize themselves to undertake the planning and development of essential amenities and infrastructure.

Introducing Community Action Planning

For the past 15 years and more, families have been moving from Mongolia’s vast interior to Ulaanbaatar to seek livelihood opportunities and education for children. They are bringing their traditional *gers* – a circular tent insulated with layers of felt and canvas – and settling

in the foothills just north of Ulaanbaatar’s established center. In the past decade, the hillsides have swiftly transformed from gently sloping grasslands to busy urban neighborhoods comprised of thousands of *khashaas* – a 700-square meter yard for the ger surrounded by timber fencing. In this way, the city population tripled and its physical size quadrupled in two decades. All the while, hardly any new infrastructure was constructed by the city.

While the landscape changes rapidly, social bonds among the newcomers are forged slowly. All are trying to secure water, electricity, and other services, but traditional nomadic life is not giving way quickly. Supported by the Cities Alliance, GUSIP brought together city stakeholders to agree on a strategy, which was completed in 2007. UN-HABITAT and the Japanese Government further supported this process since 2009 by facilitating the formation of Community Development Councils (CDCs) among ger residents in five districts and introducing the process of community action planning to develop common amenities. These amenities will be constructed in 2011.

Taking on the Problem of Floods

In the past years, ger areas were also prone to flash flooding, which resulted in a dozen people losing their



FAST-PACED DEVELOPMENT AND RISK OF FLOODS

As people arrive in Unur, many respond to the high demand for land by living too close to or even within gullies. People are injured during floods and lose property – those with the fewest resources face barriers to recover before the next disaster occurs.

The workshop results demonstrate Unur area residents' desire to work with municipal government to make their community safer.

lives in 2009. Both the municipal leadership and UN-HABITAT recognized that strategies for flood protection were urgent. Moreover, community engagement is crucial to promoting urban resilience. Therefore, UN-HABITAT engaged the Unur district community, which had experienced some of the worst flash floods, to collaborate on a Community Action Plan focused on disaster risk reduction.

Generating Solutions with the Unur Community

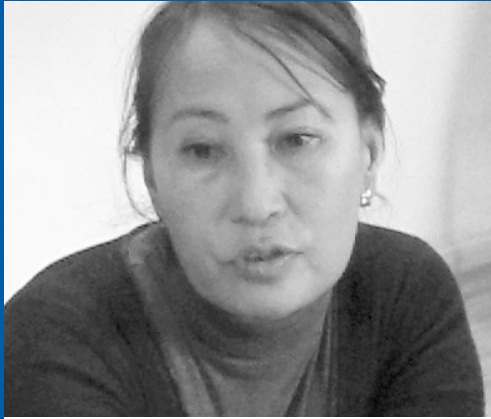
The participatory workshop on 15 December 2010 brought together residents from seven *khoroos* in the Unur area, who formulated priorities for vulnerability reduction as well as steps for integrating flood protection with existing CAPs and implementing the actions. By deciding what measures are most appropriate, the Unur residents identified a path that not only increases flood protection, but also serves to build a better, stronger neighborhood. The Unur residents have demonstrated their capacity to plan for the future of their community – they now require support from the municipality to implement this vision. Moreover, residents in other *ger* areas require support to formulate similar action plans.

This report presents the preliminary action plan of the Unur community and also provides a set of flood protection tools presented by the UN-HABITAT planning team. The report begins with a description of basic concepts of vulnerability and their relationship to urban planning

plus an analysis of flood causes and impacts. The Flood Protection Community Action Plan which follows has two parts. First, the CAP outlines a “small-scale approach” – a toolkit of practical solutions residents can undertake using their own know-how to reduce vulnerability and increase flood protection. Second, the CAP describes priorities for flood protection and an implementation schedule established by residents during the workshop exercises. The “high,” “medium,” and “low” priorities reflect both the community’s nuanced understanding of conditions in Unur and their need for engagement and recognition by the municipal government. Priorities are presented on page 19.

These priorities underscore not only the challenges faced by Unur residents in flood-prone areas, but also their opportunities to improve the overall physical and visual quality of the district as rapid urbanization continues.

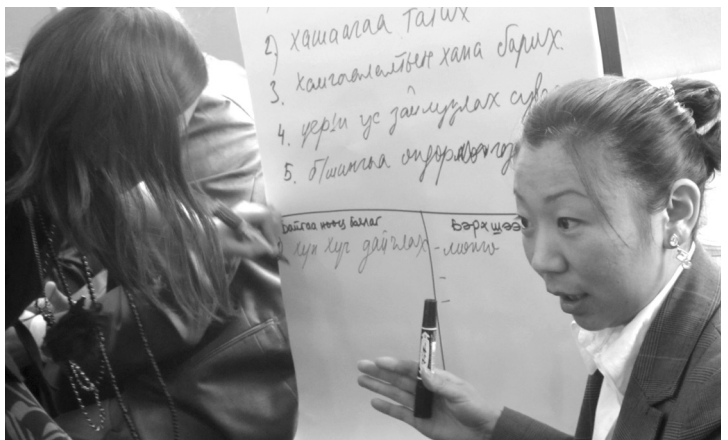
For this reason, the Unur resident’s evaluation of solutions, which is included in this report, can more broadly inform flood protection in *ger* districts throughout Ulaanbaatar. Workshop participants reported they have construction skills and materials, for example, within the neighborhood to implement physical improvements. With some technical guidance, these priorities can move forward quickly. At the same time, many priorities were perceived to have high implementation costs, which would require support from NGOs or local government. Yet in any case, the workshop results express Unur area residents’ desire to work with municipal government to make their community safer.



B. CHULUUNBAATAR

51 years old, Kheseg Leader
Living in Ulaanbaatar for 10 years

“During the hot days of summer, soil dries up and cannot absorb rainwater. So all the excess water becomes floods. The flash floods pollute the environment and also cause epidemic diseases.”



MAPPING ACTION

During the day-long workshop, Unur residents mapped flood areas in their neighborhood, evaluated their options for protection, and made priorities for action.

COMMUNITY ACTION PLAN PRIORITIES

HIGH PRIORITIES

Construction of gabion embankment walls to control erosion and increase storm water retention on *khashaas* land; and setback regulations to prevent settlement in flood-prone areas. Using local skills, social networks, and materials, these priorities could be realized immediately by residents. As more individual *khashaas* owners implement and follow these strategies, vulnerability to floods will gradually decrease.

MEDIUM PRIORITIES

Resettlement of households away from flood-prone areas; reconstruction of roads with adequate storm water drains; and elevation of homes above flood levels on earth plinths or platforms supported by

columns. These priorities require higher levels of NGO support and integration with municipal government planning.

LOW PRIORITIES

Early warning system; public awareness campaign; and restoration of gullies to their natural condition to increase storm water retention and slow floodwater flow. Low priorities could be “bundled” with and provide support for higher priorities. For example, many participants commented that Unur residents need to understand the benefits of flood protection through public awareness campaigns before they would be willing to take action.

Findings

1. Flood protection is related to community image.

Improving the visual appearance of the gullies – by preventing dumping, for example – will increase community pride. This important insight made by Unur residents during the workshop is a reminder that community action planning is about more than services and infrastructure – it also concerns how people perceive and feel about their environment and themselves.

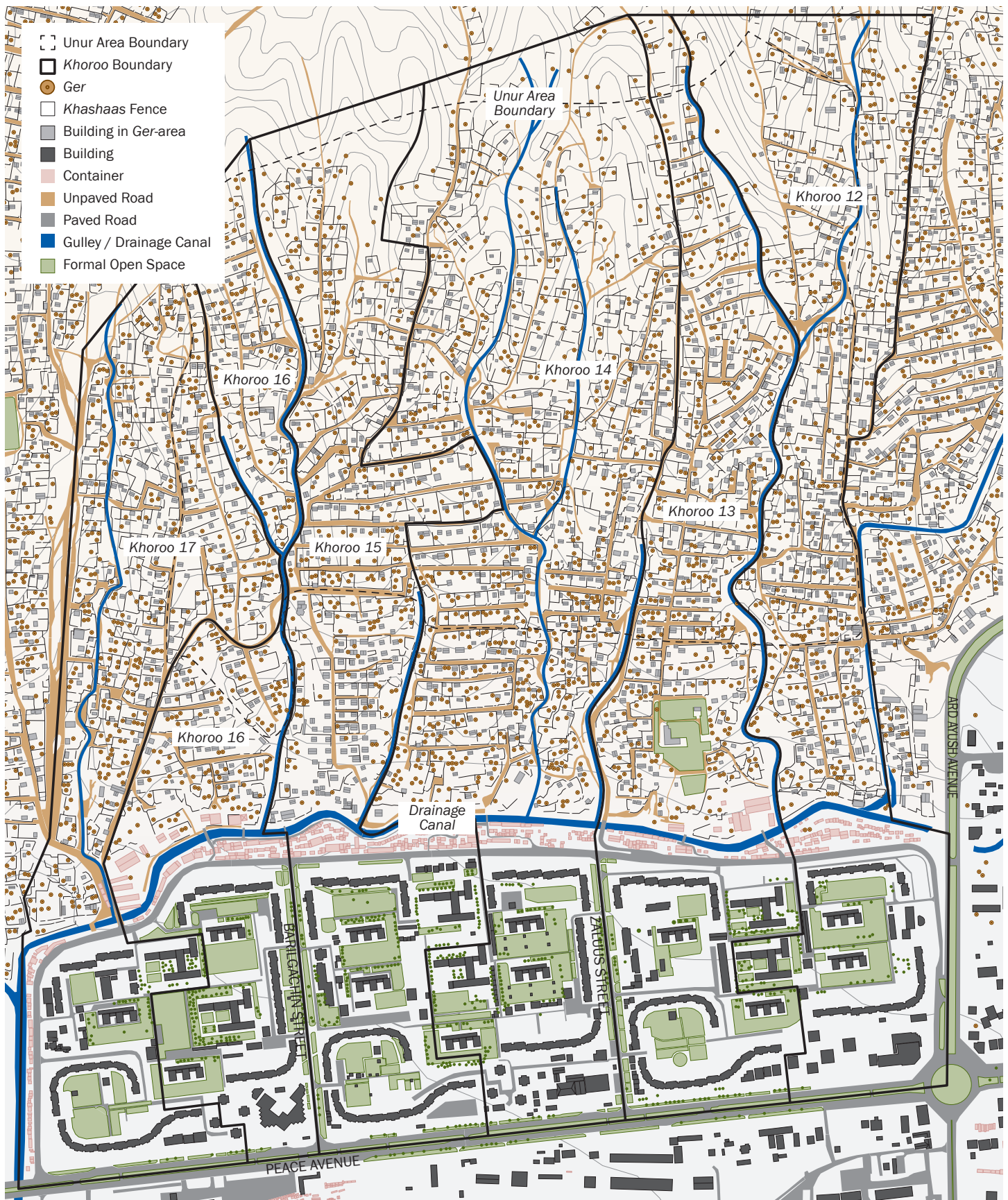
2. Increasing flood protection for residents is an achievable goal in Unur.

Based on a mapping exercise during the workshop and Geographic Information Systems (GIS) analysis, between 5% and 10% of *khashaas* (120 to 270 out

of 2,750) are located in flood-prone areas. While the vulnerability of these families urgently needs to be addressed, the overall proportion of *khashaas* that are exposed to flooding is relatively low – which makes this problem manageable.

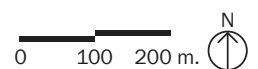
3. The physical landscape in Unur is fast-changing, so solutions to flood protection need to start at the small-scale.

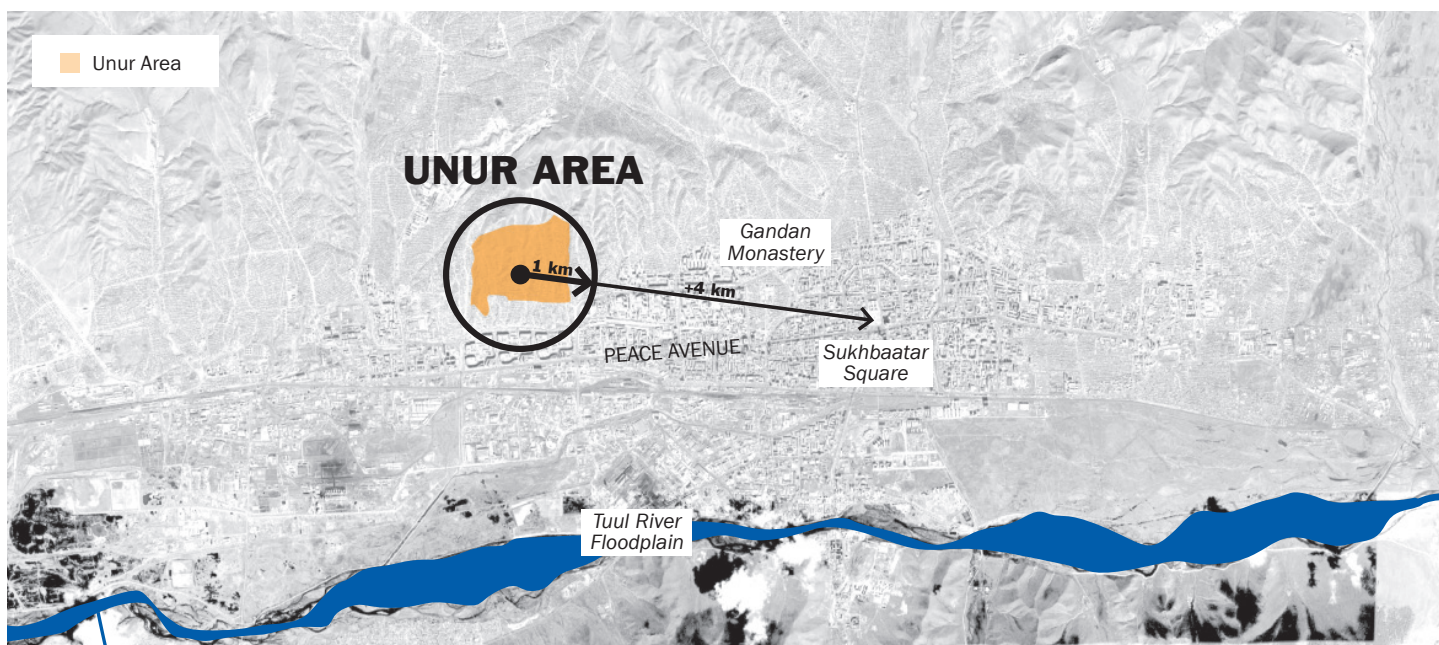
Changes to the landscape which increase or decrease vulnerability to floods are occurring rapidly in Unur. These range from excavation of earth for construction of *khashaas* to settlement of *gers* directly in the gullies. Climate change will also impact vulnerability by, for example, increasing migration to Ulaanbaatar and, subsequently, demand for land close to the city center. Yet at the local level, vulnerability is



UNUR AREA SITE PLAN

Source: Google Earth, December 2010





THE FLOODS ARE A SYMPTOM OF CITYWIDE PROBLEMS

People move to Unur and other *ger*-areas because they want to be close to the center of Ulaanbaatar. In order to be near jobs and schools, they settle in flood prone areas. But even here, they are still far from services and opportunities.

determined, in part, by small-scale human activities that are altering the capacity of the soil to absorb water and the flow patterns for storm water. Flood protection can be greatly increased, therefore, by addressing these changes.

4. **Community members have informally introduced a number of effective flood protection measures, but they need financial resources for implementing these solutions settlement-wide.**

In some locations, the community has already shown that it has the know-how and the adaptive capacity to protect the neighborhood. Furthermore, participants in the workshop gave high priority to flood protection solutions for which they possess local resources to implement – such as construction skills and materials for building gabion walls to control erosion. However,

residents consistently identified lack of capital as a barrier to implementing flood protection. Large-scale projects such as street paving, therefore, will require financial assistance from either NGOs or local government. The Community Development Council approach can be used – the CDCs can channel funding into neighborhood-level protection works.

5. **Not all residents are willing to introduce collective flood protection measures.**

Knowledge of the causes and impacts of floods is strong, but the lack of understanding of the benefits of flood protection leads to unwillingness to change among some Unur residents. Although creating a public awareness campaign was a low priority in the discussion, many residents said education about benefits of flood protection needs to precede other solutions. For example, *khashaas* owners who are

located near gullies are unlikely to be willing to adjust the boundaries of their plots until they are better informed about how this solution helps the community.

6. Investments in citywide flood protection can be reduced and improved if flash flood prevention measures at the community-level are introduced in flood-prone neighborhoods.

The planning culture of the Municipality of Ulaanbaatar prioritizes heavy infrastructure over adaptive neighborhood-level interventions. But infrastructure, on the one hand, is expensive if it is constructed with too much carrying capacity, and, on the other, becomes rapidly ineffective if designed only for present needs. Moreover, city budgets prioritized for large-scale solutions diminish or do away with budgets for neighborhood-level prevention. The Ulaanbaatar administration needs to engage with communities – consulting with them about large scale and system-wide planning and supporting easily do-able adaptation in neighborhoods.

Recommendations

Based on the above findings and the Flood Protection Community Action Plans formulated by residents, the UN-HABITAT planning team makes the following recommendations. These high-level recommendations are elaborated upon in the “Next Steps” chapter of this report:

1. Integrate Flood Protection Community Action Plans with municipal planning for citywide systems and infrastructure.

As Ulaanbaatar continues to grow, the municipal government will be required to extend services and infrastructure – such as water, roads, and footpaths – and make the urban environment safer. Vulnerability reduction should be coordinated as much as possible

with municipal planning and implementation so that flood-protection becomes a “built-in” component of services and infrastructure. There are several logical areas for immediately integrating the CAPs into government planning. These include coordination with *khoroо* government planning, flood control system and hydrology planning in the Engineering Division, and road network expansion planning in the Construction and Urban Development Department.

2. Advance urban planning goals of increasing safety and incorporating *ger* districts into citywide road networks in coordination with flood protection.

At the same time that *ger* districts are expanding in locations far beyond the reach of paved roads and city services, residents in *ger* districts close to the city center are replacing their *gers* with brick structures. The *ger* districts are both expanding and consolidating – but without the kind of strong urban planning framework that historically characterized growth in Ulaanbaatar. As local government works to increase flood protection, it should also consider strategies for providing a planned street network in *ger* districts and connections between the city and *ger* districts. Flood protection will more effectively be planned in coordination with the street network – doing so will help to structure the *ger* districts, make them safer, and integrate them into the city.

3. Flood Protection Community Action Plans are a good way to mobilize communities and encourage them to set up a Community Development Council.

When local resident groups come together to form Community Development Councils, they strengthen their capacity to address problems in their neighborhoods through improvements and manage the built environment. At the same time,

the Community Action Plans they create can help government more effectively target their investments and respond to local needs. Flood Protection Community Action Plans are a good tool to promote CDC initiatives, as they evidently focus on small gains for collective protection through a range of measures by households, street residents, and the community as a whole.

4. Continue collaboration between existing Community Development Councils and local government, promote the establishment of new CDCs, and establish their formalized role in *ger* area upgrading.

The Municipality of Ulaanbaatar should seek increased collaboration between local government and the CDCs, encourage the formation of new CDCs in more districts, and ensure that they are recognized organizations to propel *ger* area upgrading.

Local government should also encourage and invite dialogue between the CDCs and line department staff. A promising step was taken during the workshop when staff from the Construction and Urban Development Department indicated that the “door is open” for dialogue. Lastly, local government should explore the potential to institutionalize participatory planning in Ulaanbaatar by establishing a formal role for the CDCs in the development decision-making process.

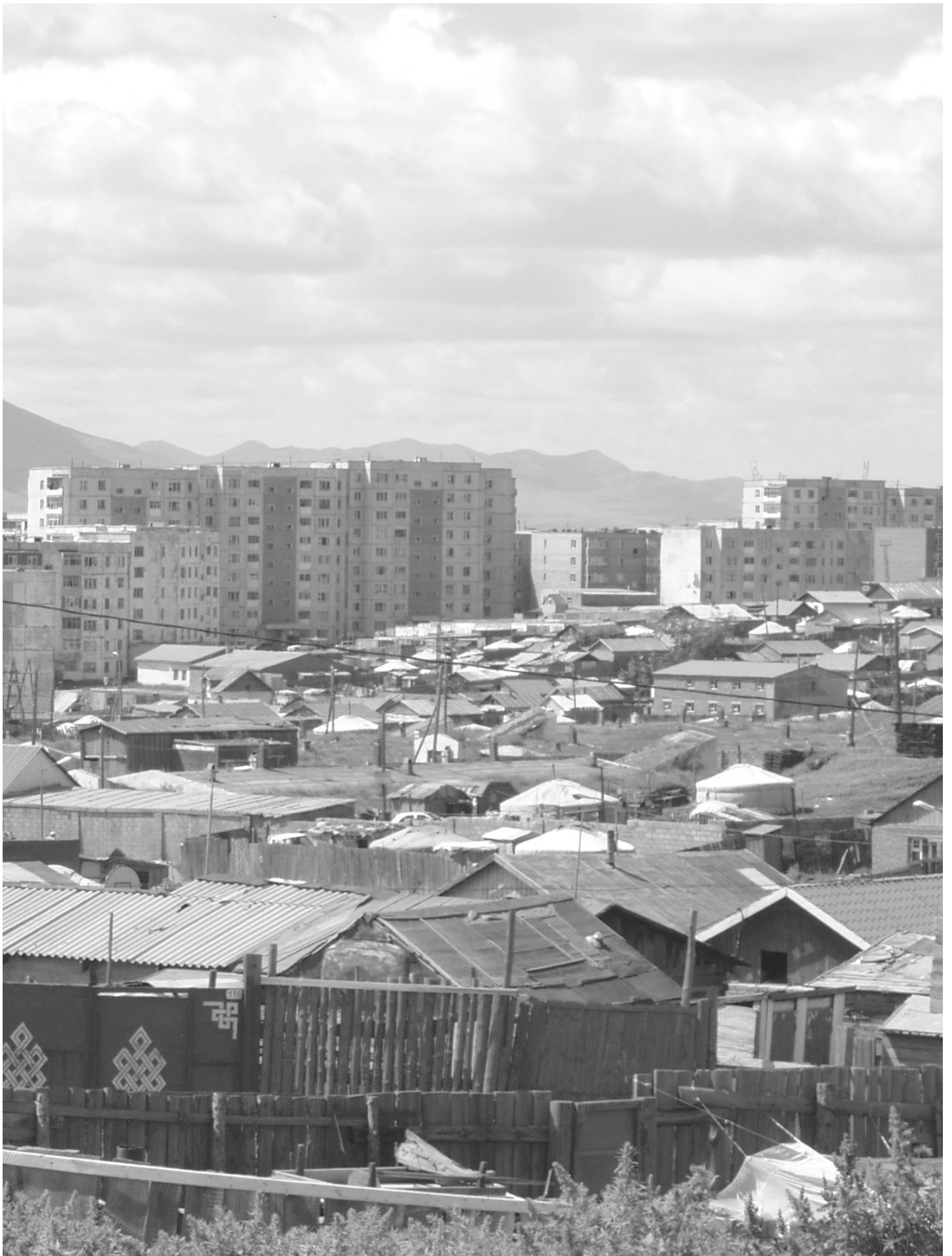
5. Implement high priority flood protection solutions with local resources and seek financial support for medium and low priorities.

Unur residents have willingness and capacity to implement small-scale flood protection projects. Because the high priorities are solutions that will gradually reduce flood vulnerability as more individual *khashaas* owners implement them, these

should begin now. Residents can use the social networks, resources like building materials, and local skills the community possesses to achieve these priorities. Local government should support these projects and seek paths to fund investments in large-scale structural projects such as street and drainage systems.

6. Begin a discussion about the role of regulation in *ger* districts.

Lack of regulation in *ger* districts results in settlement patterns which are difficult to supply with services and infrastructure and protect from flood risks. Both the enforcement of land use and development regulations and citizen awareness of the need to follow regulation are low. As flood protection in Unur is addressed in a more comprehensive way, local government and CDCs should consider how to improve the level and enforcement of regulations that both give a structure to the neighborhood and make people safe. While this is an ambitious goal requiring collaboration between local government, community groups, and individual households, the process may begin with smaller pilot projects. Creating a simple set of “guidelines” for housing near gullies, for example, may provide a good test-case for broader regulation.



INTRODUCTION

The report that follows this foreword in many ways tells a familiar story: that of communities made vulnerable by a series of events over which they had little or no control.

When, in subsequent but steady waves over the last 20 or so years, migrants left their rural districts of origin for the Mongolian capital of Ulaanbaatar, “choice” probably played a limited part in their decision, faced as they were by suddenly changed economic conditions (their livestock decimated by successive unusually extreme winters), by the collapse of the political regime and the uncertainty that such upheavals commonly bring about, by the prospects that the newly-introduced economic freedoms would imply for them, and by a new range of opportunities in urban areas.

In Ulaanbaatar, they settled in the outskirts as they were permitted and, as part of the process of privatization of hitherto State land, they were granted plots on which they erected their traditional tents (the *ger*) or simple structures which they would then improve over time.

But then, for most of them, employment opportunities did not materialize as they had hoped, delivery of basic services was scant at best, and vulnerability hazards like floods threatened their lives and their possessions in locations which turned out to be inappropriate for settlements.

The number of newcomers had obviously exceeded the feasible response capacity of the authorities – by now 1.2 million people, roughly 40% of the entire Mongolian population, live in Ulaanbaatar and, of these, 60% live in the informal neighborhoods around the city core, which are called *ger* areas.

This report tells about a community in one of the *ger* neighborhoods called Unur, where deadly floods have heightened people’s vulnerability and fragility, where community organization and action planning has begun to look at ways to reduce the hazards and improve living conditions.

More broadly, it makes the point that past planning and land management shortcomings require, if they are to be overcome, that community action planning becomes an integral part of formal planning; that, in the future protracted process of *ger* area redevelopment, communities be granted a meaningful say in strategic decisions and a formal role in implementation support.

I thank UN-HABITAT for the opportunity to participate in the workshop from which this report originates.

Roberto Ottolenghi
Urban Development and Management Consultant
Milan, Italy



THREE SIDES OF VULNERABILITY

Poor families are *economically* vulnerable because they may not be able to fully rebuild after a disaster; people who settle near the gully are *physically* vulnerable; both youth are *socially* vulnerable because they need extra help to evacuate.

CHAPTER 1

Defining the Problem of Flooding in Unur

The purpose of defining the problem of flooding is to provide a foundation for choosing solutions in the Flood Protection Community Action Plan. Floods make people and the community vulnerable when they happen – but also during the time following the disaster. A risk reduction strategy should describe what it takes to make people and communities more resilient.

This chapter starts by broadly defining the concept of urban vulnerability. Next, disaster risk reduction is discussed from the perspective of urban planning. Flood mitigation tools can be implemented in coordination with urban planning strategies to make the Unur area more accessible and connected to Ulaanbaatar. This will give more physical structure to the community and make it safer. Lastly, this chapter provides a quantitative analysis of flood impacts in Unur and the physical characteristics of the landscape that increase vulnerability.

What is Urban Vulnerability?

Vulnerability refers to the extent to which individuals or communities are negatively affected by hazards – such as floods in the case of the Unur area. Understanding vulnerability is important because it helps residents become aware of the hazards to which they are exposed. Being more aware of vulnerability also encourages people to change their behavior, if necessary, and make their families safer.

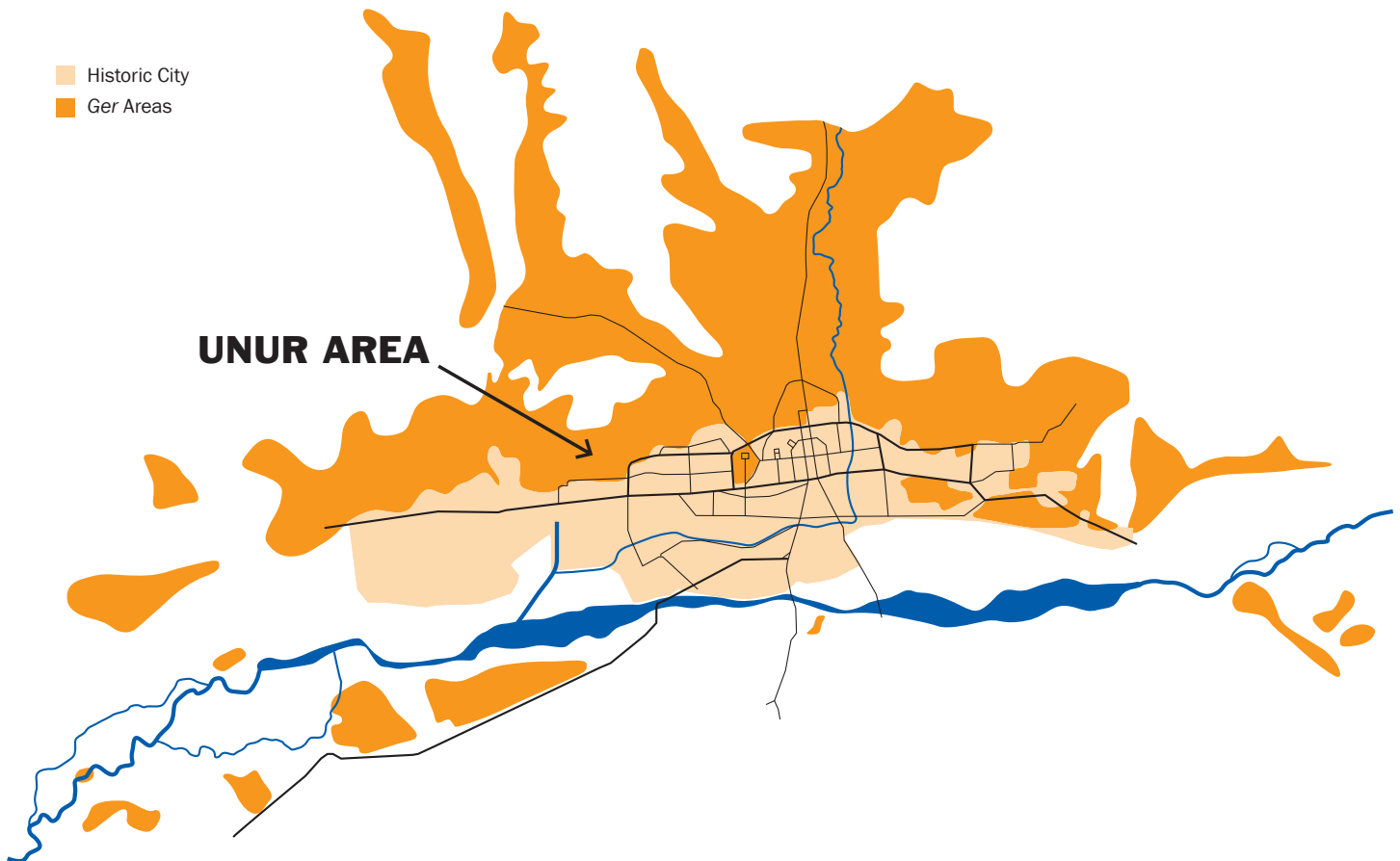
People can be vulnerable before a disaster, but also after disaster. Families who live in homes in flood-prone areas,

for example, are more likely to experience damage to their property than families who live on high ground. At the same time, disasters may leave families with increased vulnerability afterwards. For example, a family with few financial resources may not be able to fully recover or rebuild their homes following a flood – which makes them even more exposed to future disaster.

Vulnerability can be thought about in three different ways: physical, economic, and social. People exposed to one kind of vulnerability are usually also exposed to others.

Physical Vulnerability

A community's level of vulnerability can be evaluated based on their neighborhood's physical characteristics. Topography, for example, influences whether the area is flood-prone. Homes located in gullies are more likely to flood than those higher up on the hillside. Physical access and the quality of roads affect whether people are able to evacuate during an emergency. The materials used to construct housing also relates to the severity of flood-impacts – *gers* are more likely to wash away than brick structures.



GER-DISTRICT EXPANSION

Ger districts now make up over 40% of total land area. However, over the last decade these areas have expanded without the sort of compact network of streets and infrastructure that characterized development in Ulaanbaatar in the past.

One consequence of the expansion of ger districts without provision of services and infrastructure is increased vulnerability to localized hazards like floods.

Economic Vulnerability

Economic vulnerability refers to the way a family's income level relates to their exposure to disaster and their capacity to recovery afterwards. Poorer families with few alternatives are more likely to settle in vulnerable areas such as gullies in order to be closer to the city center. Families with higher income, for example, may have access to a vehicle, and so are able to live on safer ground further from the center. In addition, the cost of rebuilding after a flood can easily exceed the income and savings of poor families. If they are not able to completely rebuild following a flood, future flood impacts will be greater.

Social Vulnerability

Social vulnerability refers to how age, gender, and family size relate to vulnerability. Children need help from adults to evacuate during a disaster, but may be separated from them when the event occurs. This is especially the case in the *ger* districts, where children are often alone while parents work and are also the primary water gatherers. Elderly adults similarly need help to get out of harm's way. Female-headed households often have fewer financial resources to put towards rebuilding after a disaster.

Interrelated Vulnerabilities

Communities and families that are exposed to one vulnerability face usually others. This is often due to causation – when one vulnerability is the underlying cause of another. For example, old age may result in lower capacity to evacuate and avoid physical vulnerability.

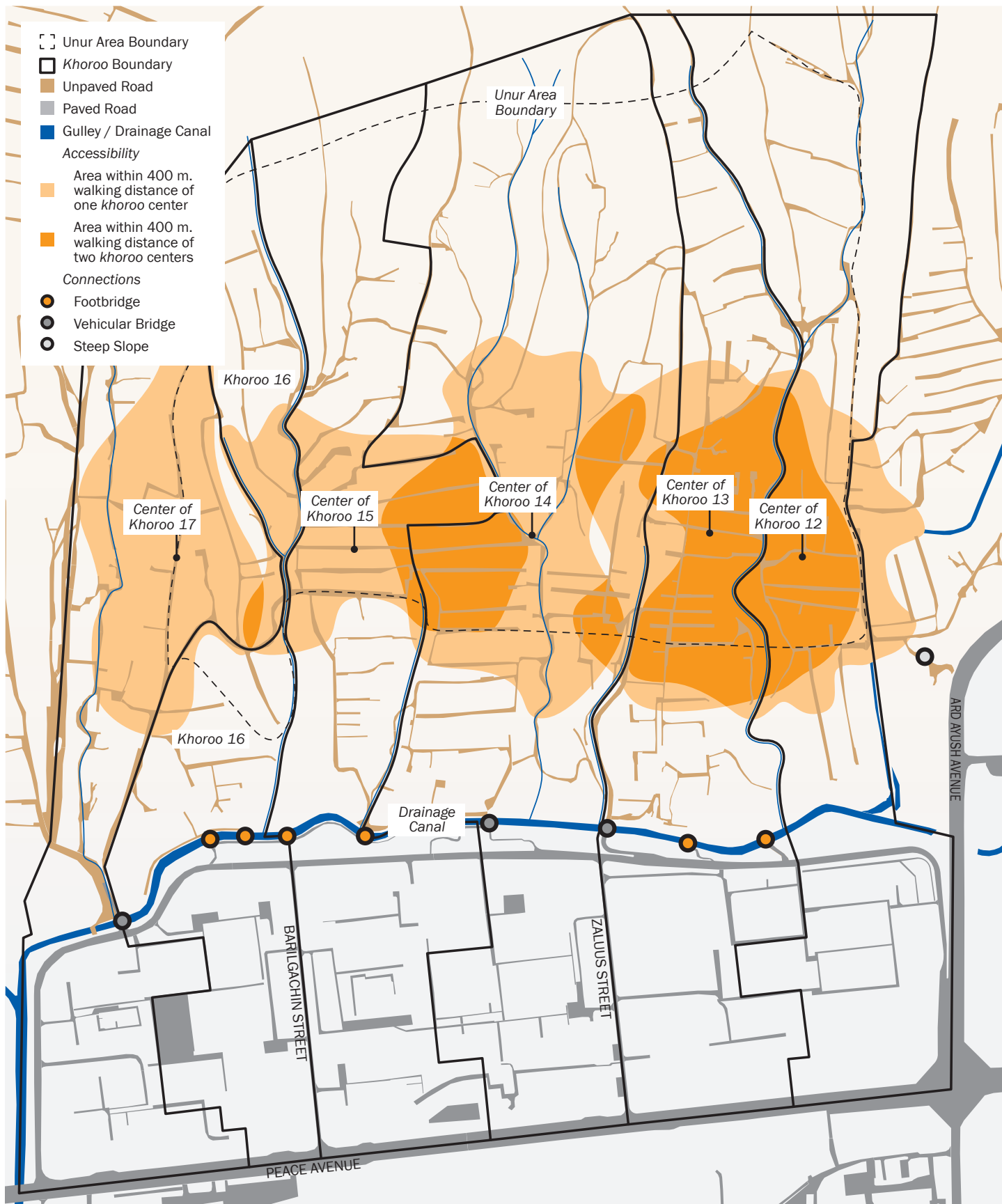
People may also be exposed to more than one vulnerability due to correlation – when one underlying cause tends to lead to multiple vulnerabilities. When people are economically vulnerable and cannot afford to be far from the city center, they may decide to settle in the gullies, which makes them physically vulnerable.

Urban Planning Issues

Today, rapid urbanization increasingly influences spatial development patterns in Ulaanbaatar. The implications of fast-paced growth are important to consider – both in macro-planning and in district and neighborhood strategies for *ger* area upgrading.

Rapid urbanization is common to many countries in Asia. But in Mongolia, things are a bit different – you might say Mongolia is undergoing rapid “*ger*-banization”, which combines the ills of urban slums and suburban sprawl. Suburban expansion, even in advanced countries, often happens in rural areas which occasionally flood. Events that are harmless before will lead to loss of life and destroyed property in newly urbanized and suburbanized areas.

Urbanization in Mongolia contrasts with other Asian countries because the housing type is unique and density in *ger* settlements is very low, yet residents usually have land tenure. Migration over the last decade and the projected economic boom are opening up new paths for development that depart from Ulaanbaatar's historically compact urban growth. Ulaanbaatar is transitioning from



ACCESSIBILITY AND CIRCULATION DIAGRAM

Source: Google Earth, December 2010





B. ODONCIMEG

37 years old, Unemployed

Living in Ulaanbaatar for 8 years

“Local people settle in the gullies because sometimes its the only place they can find near the city. Some families need two months to recover from floods, but for others it takes a lifetime to recover.”

a mid-sized capital with centrally-planned infrastructure into a vast city of *ger* districts with little provision of services. One consequence of these changes is increased vulnerability to localized hazards like floods. At the same time, new policies at the city-level are needed for managing the altered urban form, but these have not yet been formulated.

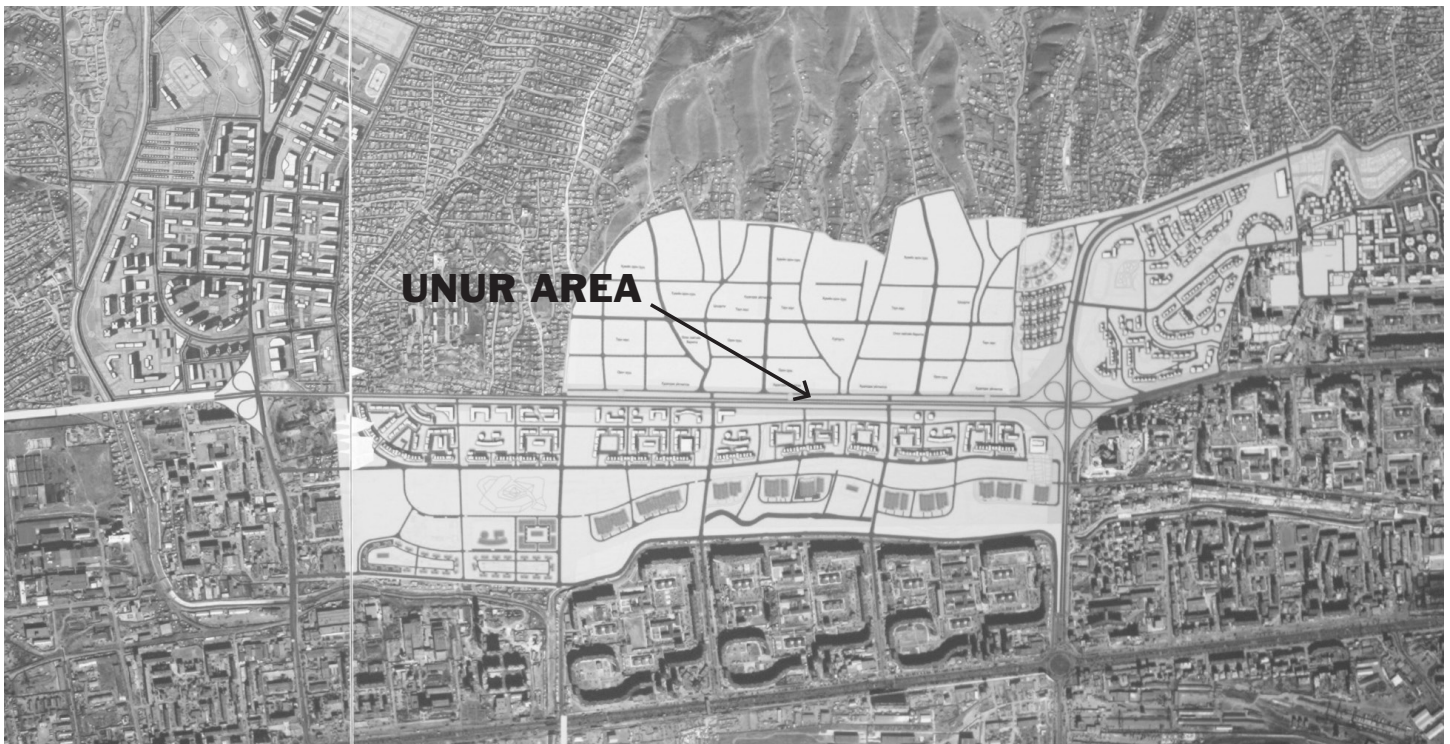
Two things are happening in Unur today that have to do with both urban planning and flood protection. On one hand, the area is expanding, but without the kind of formal infrastructure that historically organized urban growth in Ulaanbaatar. On the other, people who have been settled in Unur for many years are consolidating – they are moving out of their *gers* and building brick homes.

First of all, Ulaanbaatar will very soon be a city where over 50 percent of land area is *ger* districts. *Ger* areas total 12,363 hectares of 28,983 settled hectares of land within the Ulaanbaatar municipal boundary. In the past, the city developed through centralized planning – new housing was provided along a compact framework of streets, which, in turn, facilitated provision of heating and transportation

infrastructure. The city's tight road network gives people mobility, providing access to employment, education, and services. These levels of access are not shared by the residents of Unur and other *ger* districts.

Moreover, the *ger* districts are only loosely connected to the historic city. Physical connections between the Unur area and the paved street network, for example, are narrow wooden bridges and steep dirt slopes. If *ger* districts remain un-integrated with the historic city, the benefits of Ulaanbaatar's compact and well-connected city structure will greatly diminish. One implication for Unur residents will be ongoing hardship in accessing jobs and schools – which help to reduce social and economic vulnerability. In addition, if there are not good connections from the expansion areas to the city center, newcomers will continue to choose to settle in the gullies.

Secondly, while Ulaanbaatar as a whole is changing, something new is also happening at the level of the *khashaas* in the *ger* districts – consolidation. Along the lower elevations of the foothills in the Unur area, many residents are transitioning out of *gers* and into brick



2020 VISION PLAN

The Construction and Urban Development Department's proposed plan for Unur includes a new arterial road and replacing the *ger* areas with high-rise apartments.

The basic intentions of “Vision 2020” are good, but there is a significant misalignment between the redevelopment proposal and the priorities set by CDCs.

structures built within the same *khashaas*. Most of the new houses have electricity hook-ups and, in some cases, the timber *khashaas* fences have been replaced with cinder block walls.

Consolidation means that Unur’s current network of streets, which is difficult to service with utilities, is becoming more permanently fixed in place. At the same time, residents from *khashaas* close to the gullies are learning to live with vulnerability in the flood areas. And they are likely to stay there, especially since tenure is high as a result of government land policy entitling each citizen to a 700-square meter plot. These two issues – expansion without connection and consolidation without vulnerability reduction – show how urban planning and flood protection are interrelated.

The Construction and Urban Development Department has created a redevelopment plan for the Unur area for the year 2020. This proposal is one of many redevelopment plans within the municipal government’s overall city-scale vision for 2020. This plan includes a new system of arterial roads and large-scale redevelopment districts that would accommodate future population growth in apartment blocks located where there are *ger* districts today. The general intentions of the 2020 vision are good – provide housing, increase the amount of public space and parks, and address flooding. However, there is a significant misalignment between this official vision and the priorities expressed by *ger* area residents through community action planning.

In the Unur area, the plan proposes to extend Ard Ayush Avenue west, creating a new east-west arterial road parallel to Peace Avenue. The area between the new arterial and the existing apartment blocks to the south is proposed to be redeveloped as a series of large apartment blocks surrounded by open spaces – which is an urban development pattern known as a “superblock.” The size and character of the proposed development is similar to the existing Soviet-era housing. Flood waters are proposed to be directed through two large drainage channels. The *ger* area to the north of the proposal will be similarly redeveloped, but a detailed site plan has not yet been prepared.

There are several issues with the pattern of development proposed by the 2020 vision. First of all, the proposal does not acknowledge what is already happening on the ground – people are rapidly transitioning into permanent structures in the very area proposed to be redeveloped. Next, the size and type of development – apartment towers arranged on “superblocks” – are typically suited for flat sites, whereas the Unur area has many hills and steep terrain. Altering the terrain in the heavy-handed way proposed by the redevelopment pattern will significantly impact water flow, potentially making floods worse in the future. Lastly, the proposal will require significant investments in drainage infrastructure, which may not be the most cost effective approach in the long-term.

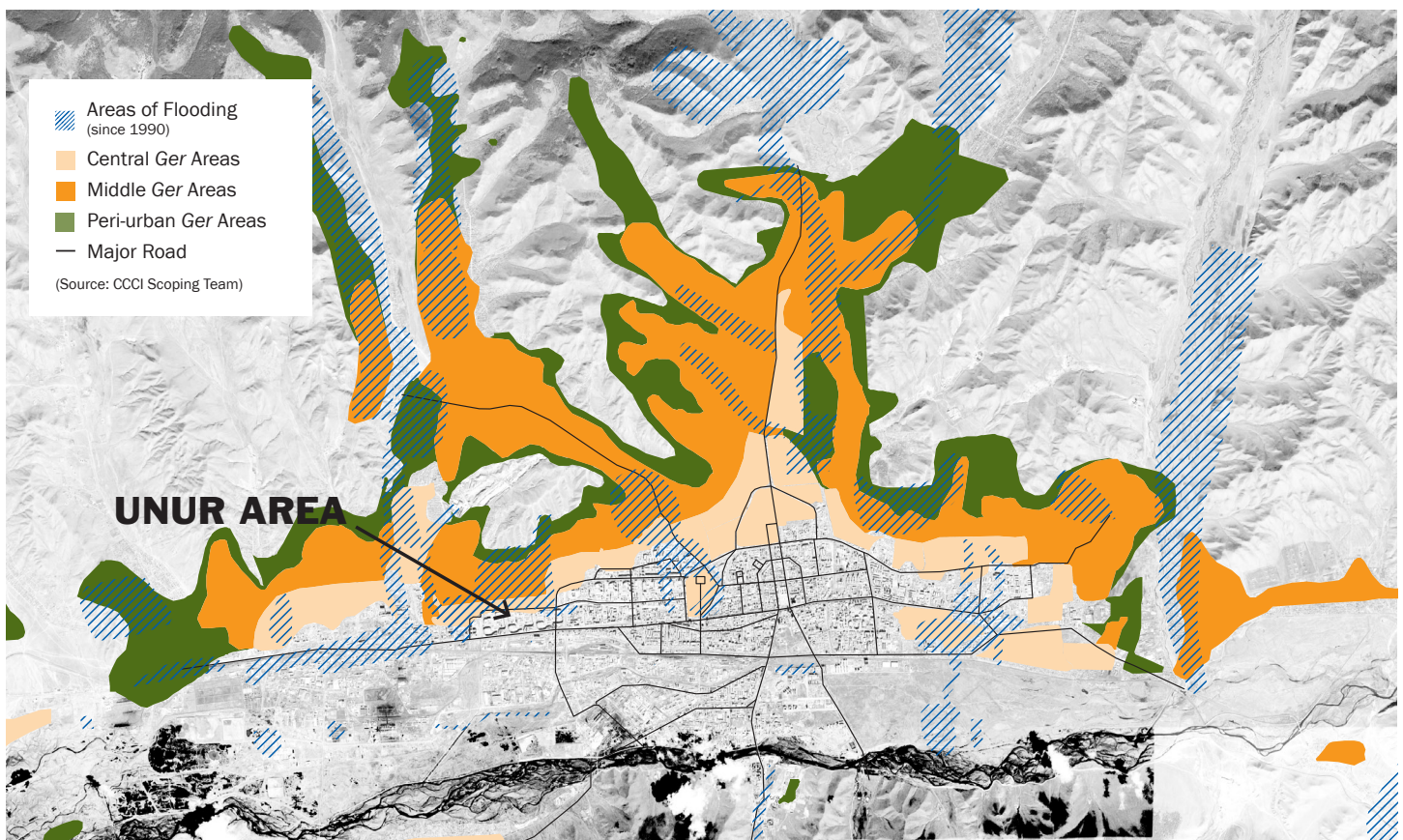
Another consideration is that – around the world – when redevelopment planning starts from scratch by removing



S. BATTSETSEG

43 years old, Private Sector
Living in Ulaanbaator for 6 years

“The floods cause disorder in the community. The floods carry domestic waste, earth, rocks, and polluted water into settled community areas. People usually lose their *gers*, sometimes *khashaas*.”



CITYWIDE FLOOD AREA DIAGRAM

Over 50 floods have occurred in *ger* areas since 1990. Middle *ger* areas are particularly exposed to floods since they are located in the lower parts of catchment areas.

Though the “middle” ger areas are most exposed to floods, there is also the opportunity here to upgrade the settlements with new infrastructure.

informal settlements and replacing them with large-scale housing, the efforts often create significant social harm. In Unur over the past three years, GUSIP has facilitated a complicated process of community formation, creating capacity among residents that is helping them to access services and become a part of the local economy. The CDCs and related social networks will remain an important resource for Unur residents for years to come. The vision 2020 plan would most likely disrupt these community connections by displacing and resettling residents – which in turn would reduce access to sources of livelihood and social support.

Understanding the Problem of Floods

The Unur district is located across several foothills just north of a large apartment development on Peace Avenue. Unur has four ridges and five gullies – these gullies mostly align with the administrative boundaries of *khoroos* 12 through 17. The gullies are natural drainage areas, in the past channeling storm water into the Tuul River floodplain. Today, water flows into a large concrete drainage canal, which runs east-west through Ulaanbaatar and forms a barrier between the apartment development and the Unur district.

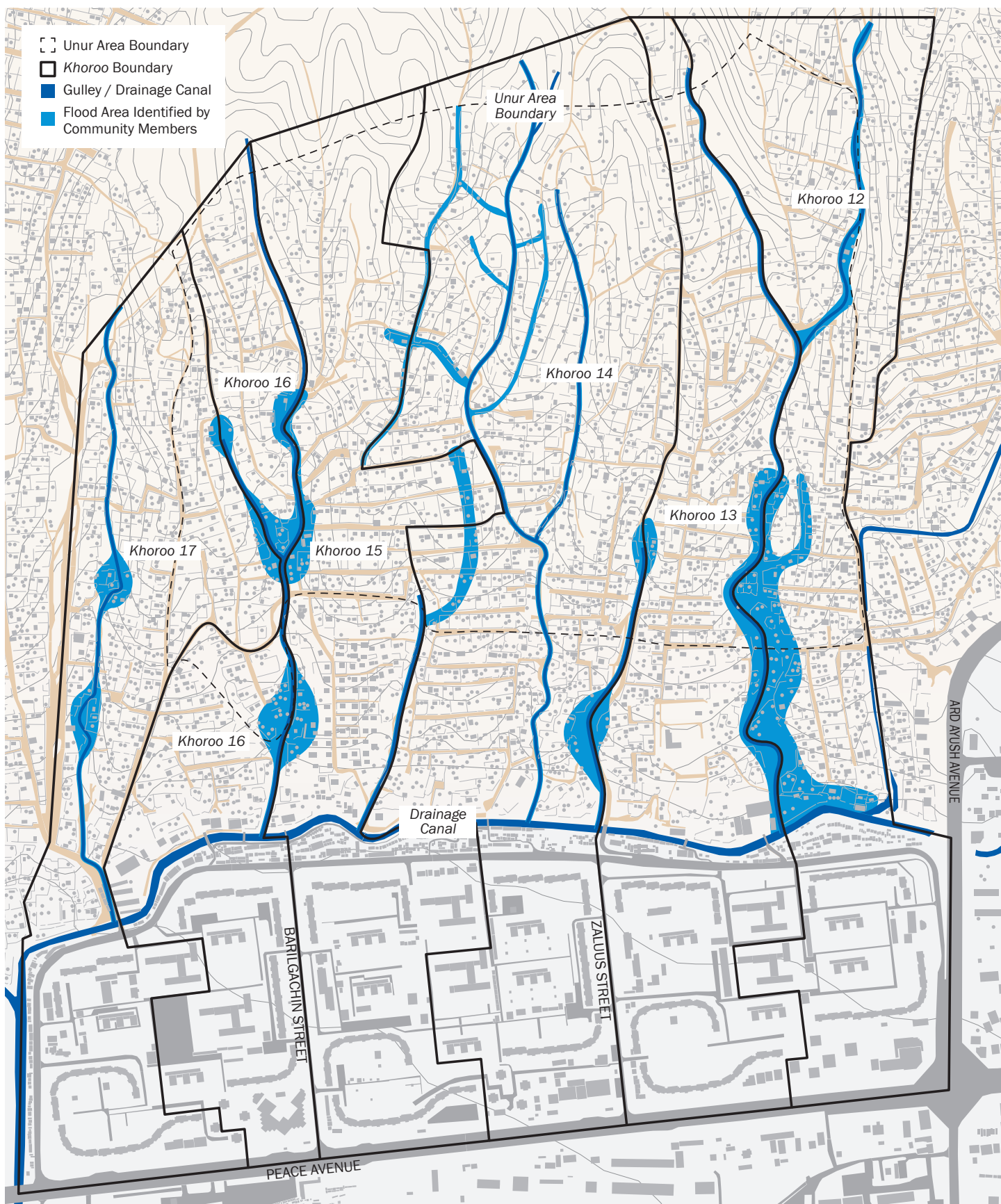
The problem of floods is not limited to Unur, but occurs throughout Ulaanbaatar. Since the 1990s, over 50 major flood events have happened both in *ger* districts and the historic city center – which is also located in the Tuul River floodplain, but is more protected by drainage infrastructure. As more people settle in *ger* districts

and, in particular, as they transition from *gers* to more permanent housing types, the costs and impact of floods will increase. Moreover, climate change will also influence floods since the severity of storms occurring in July and August are projected to increase.

The impact of the floods is especially pronounced in the “middle” *ger* areas that were identified and mapped as part of GUSIP. Whereas the “central” *ger* areas are closer to the city center and therefore more likely to benefit from drainage infrastructure, “peri-urban” *ger* areas are located high in the foothills. Peri-urban *ger* area residents either live on the ridges away from the gullies or are located in the parts of the catchment area that feeds water downstream, rather than where water accumulates. Yet though the “middle” *ger* areas are most exposed to floods, there is also the opportunity here to upgrade the settlements with new infrastructure. A combination of drainage infrastructure and local mitigation strategies can begin to provide flood protection.

Many people have settled in *khashaas* and *gers* in flood prone areas along or even within the gullies, but the number of vulnerable households is difficult to pin down because the landscape in Unur is always changing.

A basic Geographic Information Systems (GIS) analysis of the number of *khashaas* within a 5-meter distance identified 120 out of the 2,752 *khashaas* in Unur as vulnerable – about 5%. During the workshop, residents completed a mapping exercise through which they identified areas that flood. Adding these areas to the



FLOOD AREA COMMUNITY MAPPING

Source: CCCI Scoping Study Team GIS, Workshop Participant Input





**BETWEEN 5% AND 10% OF THE 2,752
KHASHAAS IN UNUR ARE VULNERABLE
TO FLOODS.**  = 100 Khashaas

GIS map results in about 270 vulnerable households – about 10%.

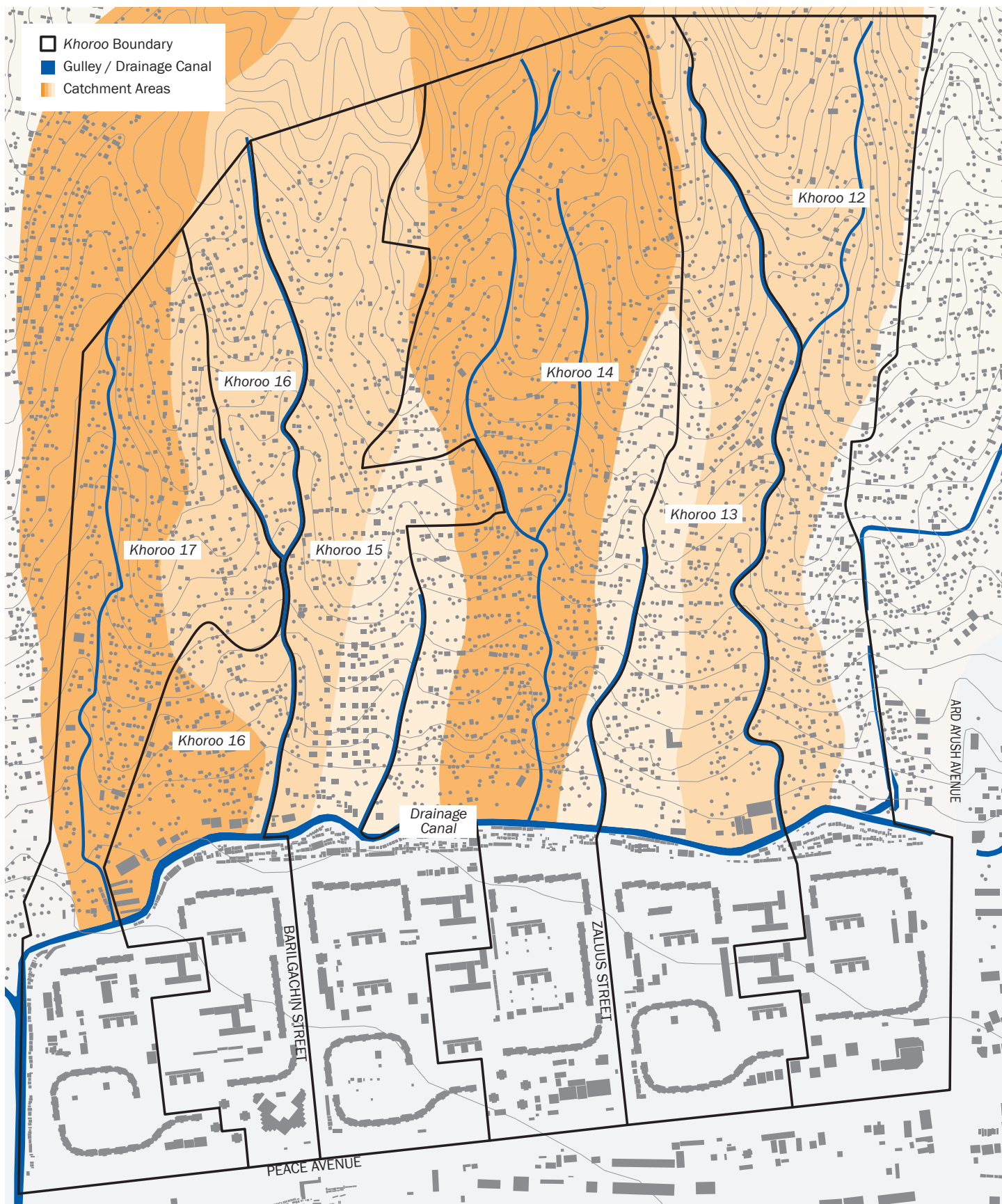
The actual amount of vulnerable households is probably somewhere in between, but even so, that number is likely increasing or decreasing from month to month. First of all, new people are always arriving in Unur and those with the fewest resources tend to settle in the gullies. At the same time, others may also move out of the gullies. In addition, a common practice when people establish a *khashaas* is to carve soil out of the hillside to create a flat plot and then push the excavated land towards the gulley edge. This effects the direction and intensity of floods, which may make new people vulnerable. Lastly, as floods come each year, erosion occurs along the gullies and on roads. Just like excavation, changes in terrain caused by erosion will effect flood size.

Even though the number of vulnerable *khashaas* is constantly changing, the overall proportion of households in flood prone areas appears to be low. This means that

the problem of floods in Unur is most likely manageable. In addition, residents have shown themselves to be well-informed about the causes and effects of floods, which provides a strong foundation for disaster risk reduction in Unur.

During a focus group discussion (FGD) and the workshop, residents described how floods occur during July and August. Floods usually follow heavy rains that last from 60 to 90 minutes. Floods may also occur during the spring snow-melt – which residents refer to as “yellow water” –, but this has been uncommon in Unur. Generally, residents are aware that as *khashaas* have been constructed, the amount of vegetation on the hillsides and gullies has reduced. This has decreased water retention during storms and increased the level of run-off in the gullies, which leads to more severe floods.

The impacts of floods are also well-understood. Floods directly impact physical safety and household property. Direct impacts include:



CATCHMENT AREAS

Source: CCCI Scoping Study Team GIS



- Damaged and displaced *gers*
- Damaged fences, latrines, and outdoor storage containers
- Loss of household possessions
- Personal injury and loss of life

Following the floods, there are also impacts to the physical environment of the neighborhood and ongoing health risks to residents. Indirect impacts include:

- Erosion of *khashaas* land and undermined building and *ger* foundations
- Difficult circulation due to altered paths, roads, and public spaces
- Health risks from contaminated water and exposure to weather
- Cost and time of clean up and repairs

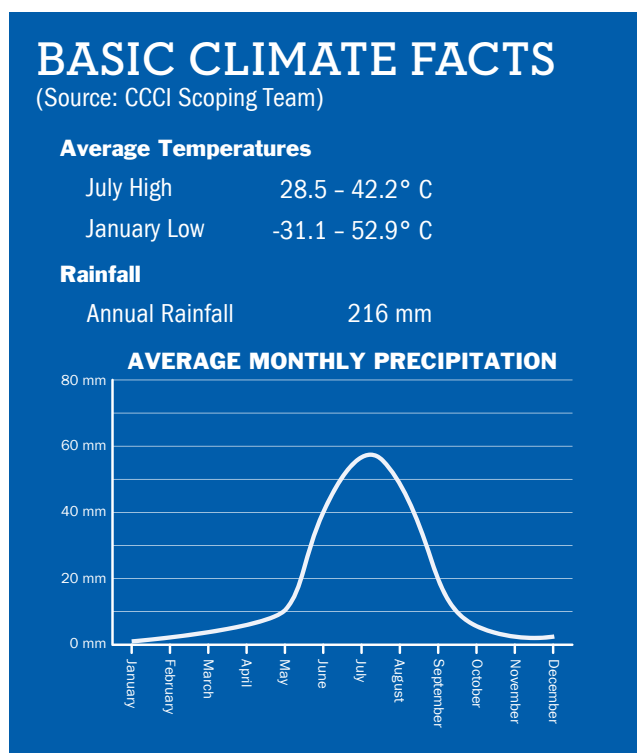
With no change to existing settlement patterns, these direct and indirect impacts will likely increase in severity as a result of climate change. Storms may become unpredictable and stronger in Ulaanbaatar, which will result in larger and potentially more frequent floods. This would, in turn, worsen the environmental problems of erosion and undermined building foundations. In addition, there is the possibility that *dzud* in rural areas will occur more often and with greater intensity. The extremely harsh winter conditions known as *dzud* devastated livestock and agriculture over the last decade. *Dzud* was a significant driver of migration to Ulaanbaatar. As migration increases, demand for land will rise, which will likely result in more families settling in the gullies to be close to the central city.

While the direct and indirect impacts reported by residents affect everyone in Unur – as does climate change –, the community mapping exercise during the workshop showed that flood impacts in each gully are location specific. Each

khoroos is separated from the next by both steep hillsides and gullies, so conditions vary from one to the next:

Khoroos 12 and 13

There are several large gullies in *khoroos* 12 and 13 that converge in the higher elevations to form a single broad gully in the lower elevations. Based on the community mapping, these *khoroos* appear to have the largest amount of flood-prone area since the gullies are so wide.

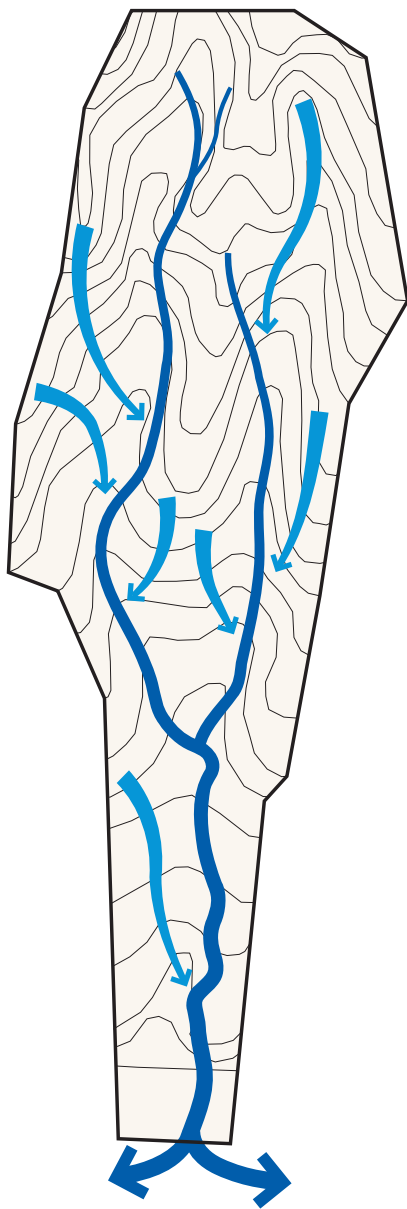


Khoroos 14

In the higher elevation areas, footpaths and dirt roads channel flood water into the gullies. Based on the community mapping, these paths appear to be becoming flood-prone areas. Like in *khoroos* 12 and 13, two gullies converge in *khoroos* 14 to form a wide gully in the lower elevations. During site visits, the planning team observed *gers* constructed within this gully.

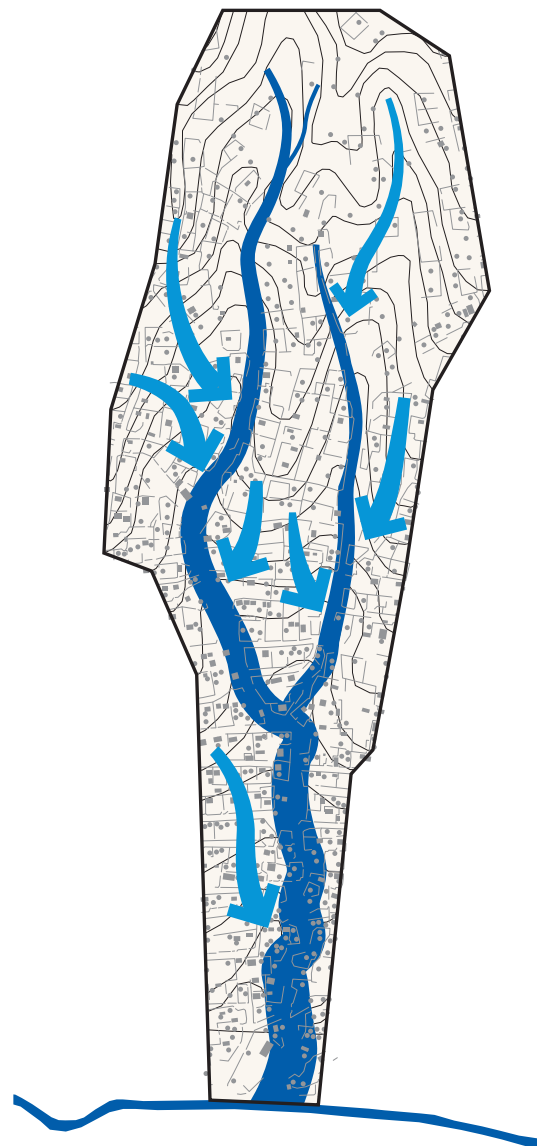
Khoroos 15

Based on the community mapping, *khoroos* 15 appears to have a channel of water that does not correspond to



SLOW LANES

Before there was development in Unur, vegetation on the ground absorbed storm water before it reached the gully.



FAST LANES

Today, there is less vegetation to absorb water, so more storm water reaches the gully. Since 50% of the catchment area is developed with *khashaas*, run-off has increased by 5% to 10%.

- Catchment Area Boundary
 Flood water in gully
- Terrain Contour
 Storm water run-off



FOUR RIDGES, FIVE GULLIES

The topography of Unur means catchment areas are actually small, so the proportion of *khashaas* that are vulnerable to floods is relatively low – between 5% and 10%.

a gully or footpath. Instead, it passes directly through several rows of *khashaas* and across six roads. In the lower elevation just west of where housing is transitioning from *gers* to brick structures, there is a large area of flooding.

Khoroos 16 and 17

Khoroos 16 and 17 appear to have the least amount of flood-prone land. However, there are two areas of flooding about midway up the hills in the western portion of the *khoroos*.

Understanding the Gullies – “Slow Lanes” and “Fast Lanes”

As the community mapping shows, floods impact many residents’ lives. So what exactly makes this problem

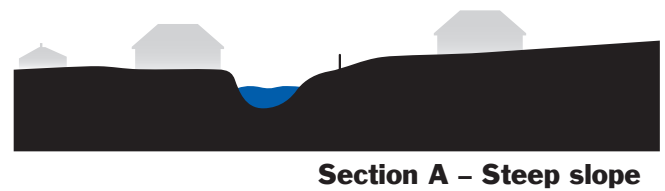
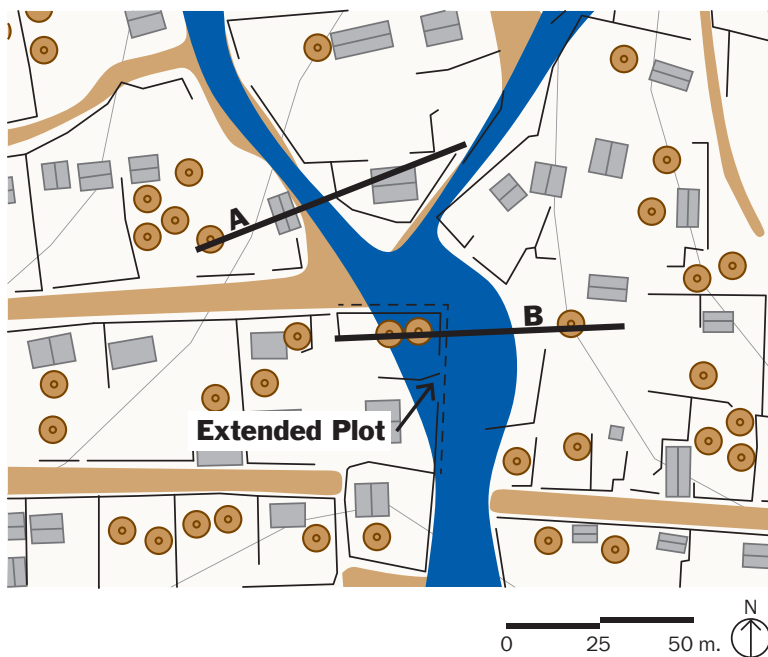
manageable? To make sense of what solutions can address the floods, it is important to look at how human activity has altered local hydrology – which refers to the movement of water within Unur’s catchment areas.

The Unur area is located on the foothills north of the city center along four ridges and five gullies. Originally these gullies moved storm water run-off to the nearest river or its tributaries. In a natural condition, when rain water falls, it drains from the area along two paths – “slow lanes” and “fast lanes.” The slow lanes are simply the hillsides. Water is naturally carried by gravity from higher ground to lower ground until it reaches the gullies. Along the way, some water is absorbed by the soil. But once it reaches the gullies, water is in the fast lane. The fast lane collects



SMALL CHANGES INCREASE VULNERABILITY

Many different activities contribute to increased exposure to floods, including dumping in the gully, excavating for *khashaas* plots, and settling in or too near the gully.



0 5 10 m.

WHY SOME AREAS FLOOD

Where the gully is narrow and the slopes steep, the gully has enough space to carry flood water, but where the gully is wide and flat, the flood water spreads out. These flat areas are usually where *khashaas* owners have extended their plots.

water and moves it towards the nearest river or floodplain. *Khashaas* settlement over the last decade has significantly changed how these slow and fast lanes work.

Mongolia has a dry climate, the average precipitation only amounts to 216 mm / year. However, 70% of the rainfall happens in the summer months from June to August. Sometimes when during summer storms the monthly average is exceeded – which means more than 100 mm of rainfall occurs in one hour – there is a flash flood. The catchment areas for rainfall – the space on either side of a gully up to the ridges – are actually quite small. They vary from 75 to 170 hectares (a typical football pitch is one hectare). Because these catchments are small, the amount of storm water run-off is actually not so great.

Whereas in the past, the slow and fast lanes carried this water into the Tuul River floodplain, today there are flood protection systems – drains and canals – that channel

run-off to the river. The water used to be absorbed by the soil and grassy vegetation in the catchment area. The top layer of soil is porous, which gives the hillsides capacity to naturally retain water – hence the slow lane. This natural retention capacity decreases how fast water flows down the hillsides, making it take a longer period of time. In the past, only 30% of the rainfall reached the gullies. The gullies are steep – hence the fast lane – and provide ample room for the remaining water to discharge from the area. If the hillsides were in a natural condition, flooding would occur outside of the area in the flat floodplains near the Tuul River. But since today this area is developed with apartment buildings, the gullies discharge into the man-made canal.

So what changed that is making the floods impact residents? First of all, in the last decade, the Unur area transformed into a *ger* district and more than 50% of the catchment area was developed with *khashaas*.



INADEQUATE INFRASTRUCTURE

Where infrastructure has been constructed either by the city or residents, it is often ineffective for managing flood and disaster. The drainage channel only protects the eastern *khoroos*; flood water easily compromises cinder block *khashaas* through erosion; foot bridges over the canal are inadequate for evacuation.

Because of the intensive use of the *khashaas*, run-off can increase by 10% - 20%. Since approximately 50% of the catchment area is covered with *khashaas*, run-off has increased by 5% to 10%. Further, in the southern area where the settlement started, *gers* are being replaced by brick buildings, which further reduces the amount of soil surface in the catchment area that can absorb water. Lastly, the large-scale flood protection system of Ulaanbaatar has not been extended into the Unur area with the exception of some entry-canals where the gullies join the main flood canal. Overall, this means that rainfall now moves more quickly through the slow lanes and less of the water is absorbed by the soil – so more water ends up in the fast lanes and the floods are bigger.

The transformation occurred little by little as thousands of families each decided to settle in Unur and the process is still ongoing. Each time someone builds a *khashaas* or *ger*, it changes the hydrology of the catchment system – how water moves along the hillsides and in the gullies – in some small way:

- The water absorption capacity of the soil is decreased because vegetation disappears.
- The water absorption capacity of the soil's top layer is decreased because of intensive uses on *khashaas* – it becomes impenetrable to water because the surface is flattened and hardened by vehicles and storage containers.
- The natural direction of storm water flow is changed when the gullies are modified to provide dirt roads and footpaths.

- *Khashaas* are situated with increasing density near or even within the wide and flat parts of the gullies – where flooding is most severe.
- Gullies are partially filled when *khashaas* owners level and extend their plot by excavating into the hillside.
- Gullies are partially filled when *khashaas* owners construct a land bridge across the drainage path to create vehicle access to their plot; this also occurs when two roads come together, but no pipe or culvert is constructed beneath so water can flow under the junction.
- Gullies are partially filled when *khashaas* owners attempt to protect against erosion by making walls from stone or tires that extend into the drainage path.
- Gullies are partially filled when *khashaas* owners dump in them because there is infrequent rubbish collection in the *ger* district.

In summary, there are many contributing factors that have altered the slow and fast lanes, increasing the severity of floods and making more families vulnerable. Most of the activities that influence the impact of floods happen because of a range of activities at the *khashaas*-level. This means – as is described by the following Flood Protection Community Action Plan – that solutions to the problem of floods are necessarily small-scale and gradual.



TS. BYAMBADORJ

41 years old, Unemployed
Living in Ulaanbaator for 20 years

“We need to integrate flood protection into community action planning and through communal collaboration. We cannot force people to do things they don’t wish to do – but we can enhance awareness.”



A ROOM FULL OF IDEAS

Unur residents brought their knowledge about the area and their commitment to improving flood protection to the day-long workshop.

CHAPTER 2

Unur Area Flood Protection Community Action Plan

This Flood Protection Community Action Plan results from a day of focused and passionate participation by 60 Unur residents from *khoroos* 12, 13, 14, 15, 16, and 17 during a workshop on 15 December 2010. The workshop was organized back-to-back with the closing seminar of GUSIP as a demonstration that communities can build on the 2007 *ger* area upgrading strategy accepted by the municipality.

The purpose of the workshop was to facilitate a discussion about how to integrate flood protection into the community action planning process and demonstrate the capacity of residents to make plans for this problem. The priorities recorded here provide a path for residents to begin to address flood protection in their community as well as key projects to integrate with their existing CAPs.

The Flood Protection CAP begins with a description of a “small-scale” approach developed by the UN-HABITAT planning team – it provides a basic framework for addressing floods in Unur. The approach is followed by the priorities for each *khoroos* as well as an implementation schedule established during the workshop by the CDCs and Unur area residents. The Flood Protection CAP concludes with guidelines for implementation that were developed by the UN-HABITAT planning team.

Workshop Preparation, Design, and Outcomes

The Action Plan formulation benefited from prior action planning by the Unur CDCs and the data collected for a city climate change study made by UN-HABITAT. The workshop had also been informed by a two-week

preparatory study of the Unur area, its spatial structure, and the extent and impact of floods.

The workshop exercises were designed to guide participants through the process of evaluating a set of flood protection tools and their feasibility for implementation in the Unur area. Residents then prioritized specific tools for their *khoroos* and established steps for identifying funding sources, integrating flood protection with existing community action plans, and implementing the tools.

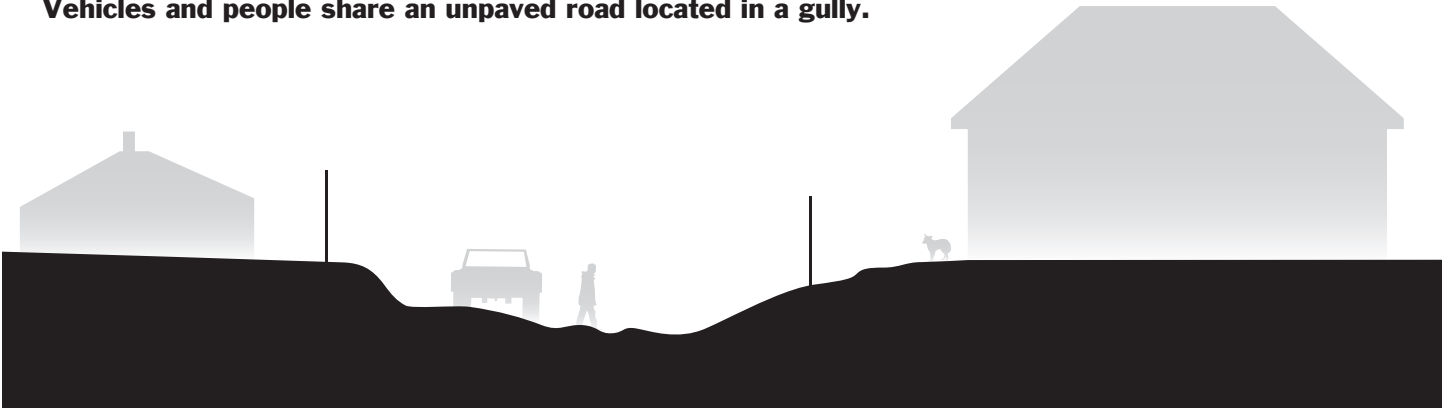
The workshop has two key outcomes:

- Flood Protection Community Action Plan for *khoroos* 12, 13, 14, 15, 16, and 17 – which consist of the priorities and implementation steps in this chapter.
- Detailed feasibility assessment of a “toolkit” of flood protection solutions and their applicability to Unur as a whole – which is summarized in this chapter and presented in detail in Annex 1.

The solutions in the toolkit were pre-selected for both their community-based character and small- to medium-scale, and therefore potentially are applicable to other *ger*

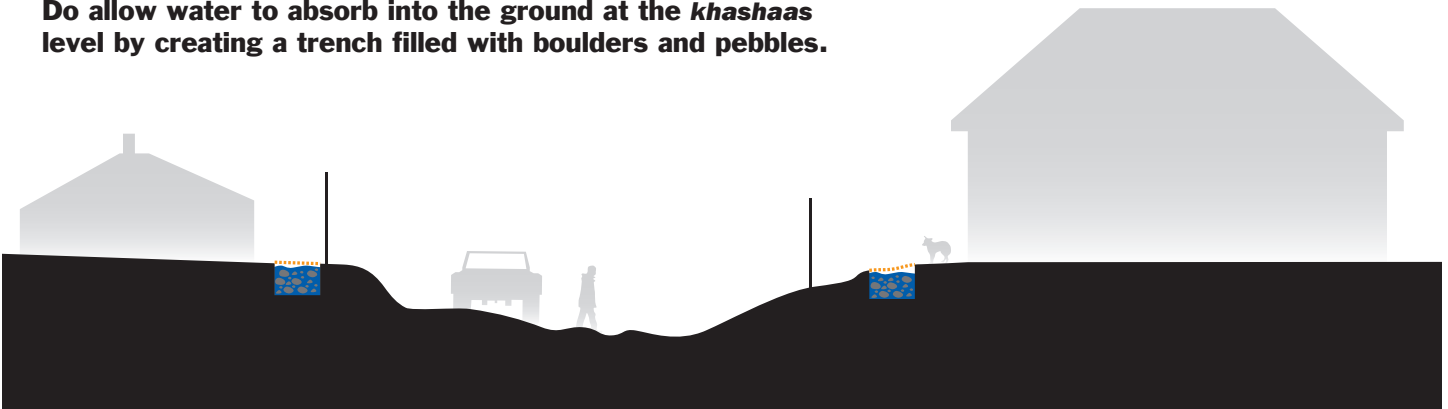
EXISTING CONDITION

Vehicles and people share an unpaved road located in a gully.



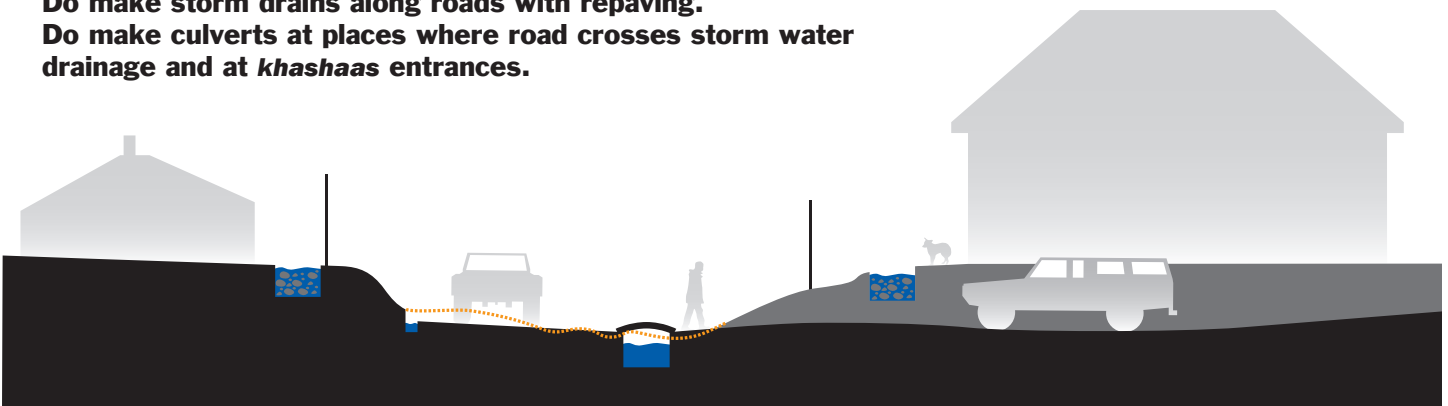
DO # 1 –

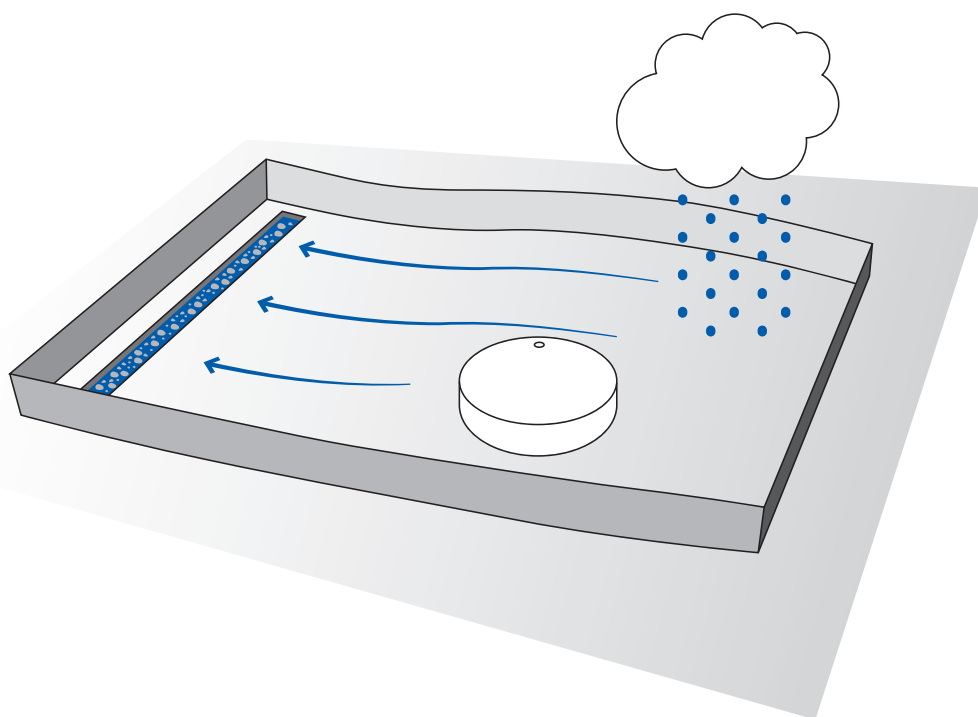
Do allow water to absorb into the ground at the *khashaas* level by creating a trench filled with boulders and pebbles.



DOS # 2 & 3 –

Do make storm drains along roads with repaving.
Do make culverts at places where road crosses storm water drainage and at *khashaas* entrances.





MIMIC ROLE OF VEGETATION ON *KHASHAAS* PLOT

By digging a trench and filling it with boulders, pebbles, or other coarse materials, *khashaas* owners can capture as much storm water on the plot as would be retained by vegetation if the ground were in a natural condition.

districts. Taken as a whole, the assessment of the toolkit helps provide a better understanding of the possibilities for flood protection in *ger* districts. For this reason, priorities for the entire Unur area are presented below.

A Small-scale Approach to Flood Protection – “Dos” and “Don’ts”

As a background for the workshop, the UN-HABITAT planning team outlined a “small-scale approach” to flood protection in Unur. This approach includes both preventative actions – “Don’ts” – and mitigation – “Dos.” These “Dos” and “Don’ts” can be achieved by individual *khashaas* owners and CDCs and therefore is in keeping with the character of GUSIP. This small-scale approach provided a starting point for identifying solutions for flood protection that can be implemented by the community and those that need support from NGOs or municipal departments.

The “Don’ts” communicate a basic principle: don’t decrease the original capacity of gullies to carry flood water beyond the reductions that have already occurred. The “Don’ts” are especially important because in addition to preventing the problem from becoming worse, these actions cost nothing:

- Don’t build new *khashaas*, extend plots, or move landfill in a way that reduces gully size or changes the natural direction of water flow.
- Don’t extend *khashaas* boundaries into the gullies when attempting to protect against erosion with a stone or tire wall.
- Don’t block the gullies and existing storm water drains with road junctions, *khashaas* entrances, or litter and garbage.

KHOROO COMMUNITY ACTION PLAN MATRIX

	KHOROO 12	KHOROO 13	KHOROO 14 & 15	KHOROO 16 & 17
HIGH	Housing Setback Gulley Restoration Resettlement	Resettlement Street Drain	Street Drain Gabion Wall	Early Warning System Housing Setback
MEDIUM	Public Awareness Gabion Wall	Housing Setback Gabion Wall	Home Elevation	Public Awareness Gabion Wall
LOW	N / A	Home Elevation	Early Warning System Gulley Restoration	Home Elevation

IMPLEMENTATION MATRIX

	FUNDING	CAP INTEGRATION	IMPLEMENTATION
COMMUNITY	Use local resources / savings groups. Need to seek expertise of specialists for specs and costs.	CDCs should review CAPs and integrate flood protection tools. Can flood protection be “bundled” with other strategies?	Short-term – Some tools can be implemented by residents, but public awareness campaign needs to precede implementation. The community needs a plan for who will maintain infrastructure once it has been built.
NGO / DONOR	Make proposal to NGO / donor organizations.	Same as above since CAPs developed in collaboration with UN-HABITAT.	Short-term – Implement flood protection as CAP improvements are made.
KHOROO GOVERNMENT	Present proposal to <i>khoro</i> Governor and <i>khoro</i> Citizens Representative Council.	Request integration of CAP with <i>khoro</i> Government plan to qualify for district funding.	Long-term – Connect CAP and flood protection with planning and budgeting cycle. Communicate with Municipal Planning Dept. about redevelopment vision as soon as possible – “the door is open.”

These preventative actions can be enhanced by creating setbacks of *khashaas* boundaries from the gullies and resettling *khashaas* from flood-prone areas. There are costs to *khashaas* owners to create setbacks and resettle, but once they are out of the vulnerable area, flood protection essentially costs nothing since no new infrastructure is required.

The “Dos” are not always easy to implement because these activities relate to restoring the original function of the gullies as storm drains. Yet, some restoration of gully function can be achieved with low technology and low cost solutions:

- Do allow water to absorb into the ground on the *khashaas*-level – reinstate the retention capacity of the soil and mimic the role of vegetation by creating underground gabion walls.
- Do make storm water ditches alongside gully roads and footpaths when regrading or repairing potholes.
- Do cap the storm water ditches on road junctions and *khashaas* entrances with concrete slabs – reuse existing slabs as much as possible.

Overall, give storm water its right of way – as the experience with flooding shows, it takes it anyway!

As residents implement “Dos,” the effectiveness of these actions will be greatly increased by following a few simple rules of thumb. First of all, one goal of the “Dos” is to restore the retention capacity of the soil to the level it would have in a natural condition. Yet in the future it is unlikely Unur will have less development, let alone return to being grassy hillsides. So, the natural capacity of soil to retain water needs to be recreated – or mimicked – by intercepting rainwater before it gets to the gullies:

- On the low side of the *khashaas* plot where water flows naturally by gravity, dig a ditch and fill it with coarse material such as gravel, construction debris and bricks, and tires. The ditch will collect water in a

storm, retaining it as soil naturally would and delay the amount of time run-off takes to reach the gullies.

- Collect rainfall from roof surfaces of brick structures to further reduce the amount of run-off reaching the gullies; collected water can be reused to water plants and for cleaning purposes.

The function of the gullies can also be restored and increased when road repairs occur. Since these repairs are currently made by CDCs and residents, flood protection can be integrated into these activities with the following rules of thumb:

- Add storm drains on either side of the road when making repairs or regrading. The cross-section of the drains is determined by the slope of the gully and road. In steep areas, the drain cross-section should be one to 1.5 square meters (about one meter wide by one meter deep); in flat areas, the drain cross-section should be two to three square meters (about two meters wide by one meter deep).
- Because the actual amount of flood water in each catchment area is low, these ditches should accommodate the run-off. However, the dimensions may need to increase near the canal and where gullies merge because there is more water in these places.
- Cap junctions to cross-roads and *khashaas* entrances with a concrete slab. If the drain is filled in, the run-off will find its own way by flooding the road – which causes erosion and undermines *khashaas* foundations.

Results of Workshop Exercise – *Khoroo* Community Action Plans

Each table at the workshop included CDC members from the six *khoroos* in Unur. The priorities set at each table therefore form four Flood Protection Community Action Plans, organized by *khoroo* areas.



BEFORE

The unpaved street is without drains and *khashaas* plots are eroding.

The priorities draw from a pre-selected toolkit of flood protection solutions created by the UN-HABITAT planning team. Workshop participants came from CDC membership, area residents, and NGO-workers who are active in the Unur district. The participants were organized into groups based on *khoroos* to set priorities. Following the workshop, the UN-HABITAT team evaluated the results to determine overall “high,” “medium,” and “low” priorities for Unur as a whole. Before prioritization, participants discussed each potential solution by asking two questions:

- What kinds of resources exist to implement the solution?
- What are barriers to implementation of the solution?

The priorities are not yet tied to specific sites or areas. Rather, the next step for the CDC members is to review these priorities, integrate the flood protection tools into their existing CAPs, and, if necessary, identify sites or areas for implementation. (See matrix on page 48.)

Implementation Schedule

The ideas proposed for implementation were generally similar across the four groups. The implementation schedule therefore applies to all four *khoroos* areas. (See matrix on page 48.) Workshop participants developed ideas for funding, integration of flood protection with the community action plan, and paths for implementation – community-led, in partnership with NGO or donor, and with *khoroos* government support.

In the short-term, the CDCs should work towards implementing flood protection tools for which there is community capacity. NGO or donor support may also help to implement larger-scale projects in the short-term as they are integrated with the CAPs. In the long-term, CDCs can work to integrate flood protection community action planning with the planning and budgeting cycle at the



AFTER

Gabion walls control erosion, the road has a drain, and a *khashaas* setback creates pedestrian space.

next level of local government – the *khoro* Governor and *khoro* Citizens Representative Council.

Implementation Guidelines

The following ideas from the UN-HABITAT planning team are intended as general guidelines to direct the work of CDCs as they move forward with implementation of flood protection in Unur.

First of all, an important observation made by a resident during the workshop was that flood protection is related to perception of community image. If the gullies become restored green corridors of vegetation and kept free from rubbish, these improvements to Unur's visual appearance will increase community pride. This simple insight is a reminder that implementing CAPs is about more than services and infrastructure – it also concerns how people perceive and feel about their surroundings and themselves.

Mobilize Practical Know-How

Next, mobilizing practical know-how is critical to getting flood protection initiatives off the ground. Flood protection begins with enhancing storm water absorption on *khashaas* plots and deterring *ger* settlement in the gullies. Community members recognized this during the workshop by making gabion wall construction and housing setbacks top priorities. In the short-term – the next 12 months –, the CDCs can make immediate and visible progress on these two priorities by utilizing existing social networks, construction skills, and materials like sand, stones, and tires.

Recognize that Flood Protection is Gradual

The CDCs should keep in mind that the small-scale approach is gradual – the benefits of these solutions accumulate over time. This means, for example, as more



BEFORE

Khashaas plots are built too close to the gully edge and there is rubbish dumping.

and more residents improve retention on their *khashaas*, the severity of floods throughout the area will incrementally decrease because less water is draining to the gullies. Gradually, household-level actions will add up to improved flood protection for everyone in the *khoroos*.

At the same time, it is important to acknowledge that comprehensive upgrades must eventually come to the Unur area, even though the cost is currently out of reach for the CDCs. No roads in Unur have asphalt surfaces, for example, but paving them is a priority in existing CAPs. The medium-level priorities set in the workshop were new street drains and policy for resettling families away from the gullies. The CDCs need to partner with NGOs and the municipal government to attract financial resources and implement these tools in the long-term – in the next three years.

“Bundle” Priorities so Improvements Serve More than One Purpose

As the CDCs work towards these priorities, they should be on the lookout for opportunities to “bundle” flood protection tools with other improvements. For example, street drain construction can be coordinated with paving of important road connections in Unur. Over time, the paved streets will be more durable because water that might damage the asphalt after storms will drain away.

One way to think about “bundling” is that city infrastructure and services should be “multivalent” – which means something has more than one purpose or application. In this case, upgraded streets can serve the purposes of both helping people get around better and improved drainage. Combining projects in this way will help the CDCs, NGOs, and municipal government make the most out of the resources they have for flood protection.



AFTER

Erosion is reduced by restoration of natural gully edge and *khashaas* are setback from the flood area.

Overall Flood Protection Priorities

The following priorities reflect those articulated by all participants in the workshop. The overall priorities for Unur synthesize the participants' collective discussion and evaluation of flood protection tools, reflecting perceived needs, resources, and barriers. This discussion is summarized in the "Flood Protection Toolkit Matrix." (See Annex 1 – Flood Protection Toolkit for detailed descriptions of each tool.)

High Priorities

GABION WALL

Gabion walls are steel or aluminum cages filled with stone, construction debris, or other materials. They are typically used as retaining walls to prevent soil erosion, but are also buried in underground trenches to capture and retain storm water run-off. In Unur, erosion is occurring where *khashaas* have been created close to gully edges.

HOUSING SETBACK

A housing setback is intended to prevent future settlement in or near gullies and to remove existing *gers* and *khashaas* from flood-prone areas. For existing *khashaas*, the setback may require adjustment of *khashaas* boundaries or reduction in plot area.

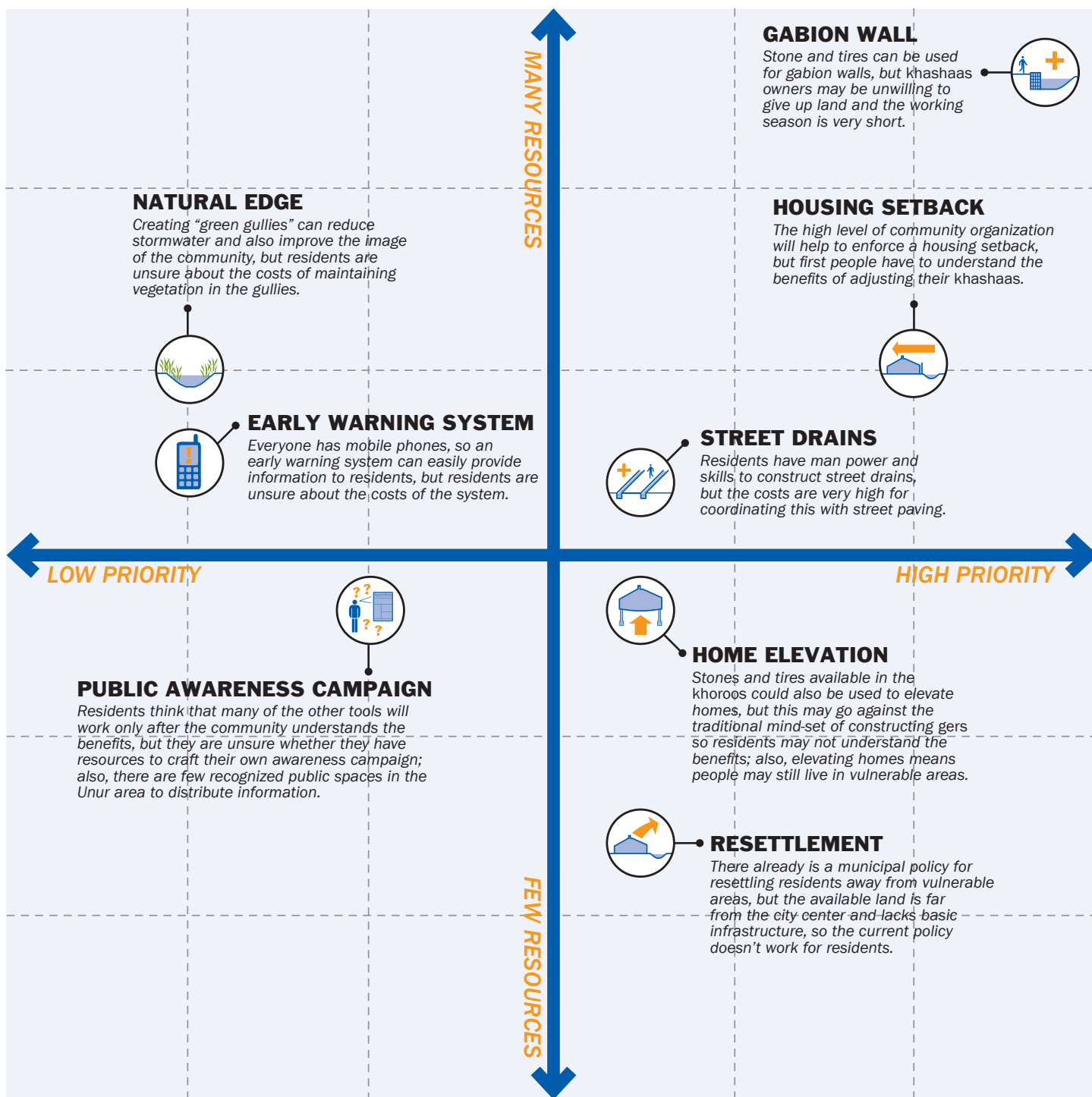
Medium Priorities

RESETTLEMENT

The municipal government already has a resettlement policy in place, but it does not meet residents' needs because the designated new housing location is far from the city center and lacks services. This priority is therefore for adjustment and improvement of that policy.

STREET DRAINS

Drains along roads channel water during storms and prevent erosion of unpaved road surfaces and adjacent



HOW TO READ THIS MAP...

This map interprets and summarizes participants’ discussion of resources and barriers for implementing the toolkit. Residents thought, for example, that they already possess resources for the tools in the upper right quadrant, so these are the highest priorities. This map can help evaluate solutions, but is not the only decision-making tool.



D. ALTANTUYA

42 years old, Private Sector
Living in Ulaanbaator for 42 years

“Buildings and *khashaas* are constructed blocking the natural ravines and gullies in the Unur area. But people live here because they need to be near the city in order to feed their families. The community can clean the ravines and gullies from domestic waste.”

khashaas land. Drain installation is especially important at *khashaas* entrances and road junctions. Currently, drains do not extend under entrances and junctions, so water pools in these areas.

HOME ELEVATION

Gers can be constructed on a raised earth plinth or platform supported by columns above the flood level to protect the tent structure and household possessions.

Low Priorities

PUBLIC AWARENESS

A public awareness campaign distributes information about flood protection tools and their benefits to residents through posters and other media as well as trainings.

RESTORATION OF NATURAL GULLEY EDGE

The restoration of vegetation will stabilize gulley edges, which prevents erosion, slows water during storms, and increases water retention. Restoration of gullies to a natural condition is an ideally sustainable approach, but

difficult to achieve due to the harsh winters and short growing seasons.

EARLY WARNING SYSTEM

An early warning system communicates information through radio, mobile phones, and other technology about approaching storms and safety instructions. An early warning system known as N.E.M.A. is already in place in Ulaanbaatar so this priority is for adjustments and improvements to the existing program.

Assessment Resources and Barriers

The assessment of available resources and barriers for each flood protection solution by workshop participants provides a “feasibility test” for the priorities. This evaluation informs the Implementation Schedule and Guidelines described above and – though specific to the Unur area – provides insight on which tools will be applicable in other *ger* districts.

Workshop participants first selected solutions from the toolkit which they thought addressed needs in the



SIGNS OF ADAPTIVE CAPACITY

Hand-made staircases, semi-elevated gers, and retaining walls are examples of strategies that have already been developed to address the steep terrain, erosion, and floods.

community. Then, for each tool, participants discussed resources and barriers. Whereas resources refers to skills, materials, and government programs that can help make a solution a reality, barriers include real and perceived constraints on implementation – from climate to funding to access to information. (For a full description of the workshop exercise, see Annex 2.)

The kinds of resources identified by workshop participants differ in informative ways from the barriers. These differences help to group the flood protection tools into short-term (zero to 12 months) and long-term solutions (one to three years), identify which tools the community can start to implement, and what kinds of additional resources are needed.

The discussion about resources focused on implementing small-scale solutions. The resources included human know-how, materials, and technology. Participants reported that both the high level of community organization and construction skills will help to implement the highest priority – gabion walls. Residents report there are stones and tires in Unur that can be used to construct walls. There is even evidence that residents have started to address erosion by building retaining walls from tires. The sense of community organization can also advance lower priorities such as public awareness campaigns – there is both a strong social network and wide ownership of mobile phones for sharing information.

Some of the barriers that pose a challenge to implementation relate to cost and environmental conditions. The medium-level priorities established in the workshop will likely require funding from NGOs, donor institutions, or local government. At the same time, there is a need for better information about the cost of solutions. A

public awareness campaign and restoration of gullies were low priorities, but these may be less expensive than the higher priorities selected by residents. In addition to cost, the harsh winters and short season for outdoor labor are constraints on solutions requiring construction.

ADAPTIVE CAPACITY

The following examples of adaptive capacity could have applications for flood protection.

- Hand-made stairways improve mobility.
- Self-constructed retaining walls using tires and stone are intended to prevent erosion and exposure to flooding, but are not always effective.
- The Community Development Councils are a new form of collective organization to solve problems and advocate with government.
- Use of text-messaging and mobile phones for government-sponsored emergency warning system.

Another barrier has to do with access to information about flood protection. Whereas there is generally good awareness of the causes and effects of floods in Unur, community members have less understanding of the benefits of addressing the problem. For example, residents place more value on being close to the city center than on settling in a less vulnerable area. Being close to the city is a real need, which leads to unwillingness to change. So, workshop participants concluded the barrier of lack of understanding in many cases needs to be addressed before other solutions can be implemented.



E. NINDEV

26 years old, Social Worker
Living in Ulaanbaator for 9 years

“The first thing we need to do is get a community action plan. We need to keep the edges of the gullies and ravines natural and if people settle in the ‘hotspot’ areas, they need decent protection walls.”



CREATING A PATH TO FLOOD PROTECTION

Most of the participants in the workshop are already experienced in community action planning, so they quickly mapped out the steps needed to implement solutions.

CHAPTER 3

Next Steps

The following recommendations differentiate between the process for incorporating flood protection into the existing CAPs and upgrading efforts, and for integrating the work of CDCs with government planning and budgeting.

Community Steps

1. Identify flood protection solutions CDCs can implement with minimal outside assistance.

Many solutions prioritized by residents can be implemented utilizing resources and skills that the community already possesses. A first step would be for CDCs to identify what projects can be implemented with minimal outside assistance and low levels of funding. Small-scale projects that require little funding can be undertaken directly by residents in coordination with *khoroos* officials. Progress can be made right away in addressing flooding issues.

NGOs and local government will need to provide technical guidance to identify appropriate implementation sites and detail project specifications. For example, residents can use stone collected within the community and local manpower to construct gabion walls, but will need guidance to select sites where the project will have the greatest impact.

2. Integrate projects with Community Action Plans.

The CDCs have already developed Community Action Plans through a participatory process. A next step is for the CDCs to revisit these plans together with residents and integrate the flood protection measures

they believe are most appropriate to vulnerable areas in their neighborhoods. By aligning the CAPs with flood protection measures the community will present a more detailed and articulated vision for Unur's future development. This will make the CAPs more powerful as advocacy tools for attracting funding from the district government.

3. Identify potential private sources of funding and support for flood protection.

The implementation of flood protection projects requires financial resources and technical support. Some priorities set during the workshop will require mobilization of funding through mechanisms and institutions outside of the community. The CDCs should undertake an exercise to identify and prepare proposals for NGOs, international agencies, and other institutions that can support flood protection improvements in Unur.

4. Attain backing from *khoroos*-level governors and city departments.

The CAPs should be presented to the *khoroos* governors to seek backing. Attaining the support of *khoroos* governors will give the CAPs more credibility since their official endorsement demonstrates that



consensus has been created not only among residents, but with officials in charge of the neighborhoods – thereby presenting a shared vision of development. The Construction and Urban Development Department demonstrated during the workshop that it is open to integrate the vision of the CDCs into existing development schemes. CDCs should approach this department to integrate their plans into the municipal government's plans.

Local Government Steps

1. Integrate CAPs with existing development plans at the city-level.

The city-planning department already has resettlement and road network expansion plans for the Unur district. However, these planning documents are not yet coordinated with the CDCs' vision for their communities. The city should seek to integrate the CAPs with existing municipal planning efforts for resettlement, infrastructure, and water management. For example, municipal staff and the CDCs could work together to agree upon strategies for the road network that provide the most effective linkages between Unur and the existing paved streets.

2. Continue collaboration with Community Development Councils.

CDCs can be productive partners to strengthen local government capacity to address flood protection and neighborhood consolidation. Most of all, local government should seek to establish a formalized role for the CDCs in the development process. One area of collaboration could be setback regulations. Local government could work together with CDCs to decide upon and maintain a set of regulations that identify vulnerable areas and establish setbacks. The CDCs' role could be expanded if local government delegates responsibility for raising awareness about the regulations and monitoring and enforcing them – which will ensure compliance.

3. Conduct training to incorporate flood protection at the *khoro*-level.

The first line of response for flood protection is found at the level of government closest to residents – the *khoro*-level. It is important for local government to prepare for and understand what is needed to implement flood protection solutions. The *khoro*-level government staff should therefore undertake trainings about disaster risk reduction and regulation enforcement to help support *khoro* governors.

ANNEX 1

Flood Protection Toolkit

The following “toolkit” provides 10 case studies of flood protection solutions that have been tried with success around the world. Many come from warm and tropical climates that differ significantly from Ulaanbaatar and so these solutions are presented as tools to be adapted to the context of *ger* districts. Towards this end, participants in the 15 December 2010 workshop assessed the feasibility of each of these tools. The toolkit includes a summary of residents’ perception of resources available for these solutions and barriers to implementation.

Ideally, flood protection tools are applied as part of a comprehensive water management strategy for neighborhoods, cities, and regions. However, given the rapid pace of urbanization in the *ger* districts, it is more likely that flood protection solutions will be implemented gradually by many different individuals and groups – from *khashaas* owners to CDCs to the *khoroos* government. Yet whether implemented one-at-a-time or in “bundles,” the following general principles should be kept in mind:

- Floods are a part of nature – the most sustainable approach is to restore the storm water catchment area and floodplain to their natural conditions.
- Conservation and mitigation – “non-structural” solutions – are usually more economically efficient in the long-run than engineering solutions – “structural” solutions.
- Addressing floods can fulfill other urban planning goals such as increasing recreation space and improving pedestrian safety.
- Flood protection should be integrated with land management.
- Vulnerability to floods has to do with more than just floods – vulnerability is related to poverty, housing, and other factors.

EARLY WARNING SYSTEM

CASE: Cyclone Preparedness Program, Gov't of Bangladesh
LOCATION: Coastal Bangladesh

HOW IT WORKS

Government sends warnings to network of volunteers in vulnerable areas via radio; volunteers trained in immediate response and evacuation.

WHAT THE COMMUNITY HAD TO SAY. . .

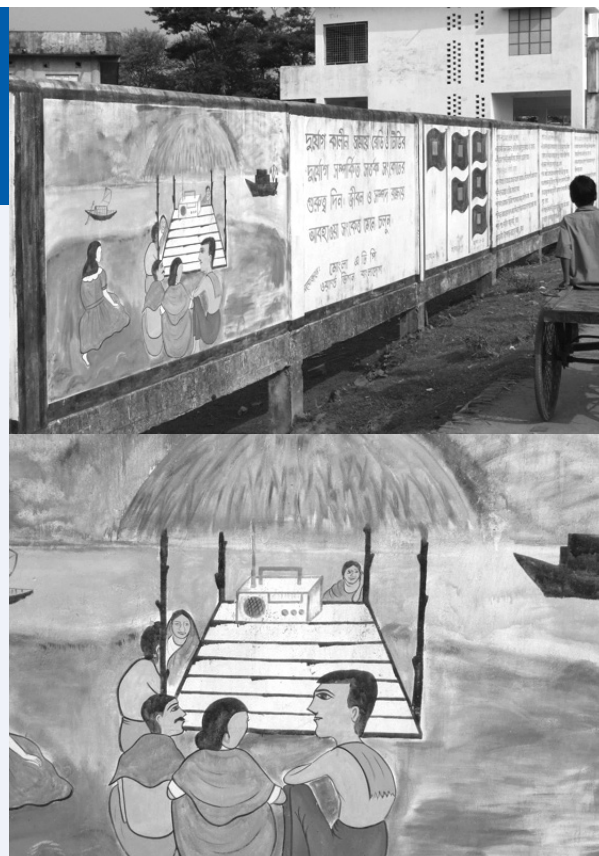
Most residents have access to communication technology to distribute public awareness campaign and some have participated in previous emergency trainings. There is a need for a comprehensive database of contact information for households. Residents are also concerned about whether an early warning system would be effective since people have different schedules.

PROS

Uses affordable technology
 Community-based
 Reaches large amount of people

CONS

Centralized (information must come from government)
 System needs to be promoted
 Relies on existing social networks



PUBLIC AWARENESS CAMPAIGN

CASE: Post-earthquake Rebuilding Campaign, Japan International Cooperation Agency
LOCATION: Padang, Indonesia

HOW IT WORKS

Information is distributed to community through easy-to-understand illustrations; printed materials support public trainings.

WHAT THE COMMUNITY HAD TO SAY. . .

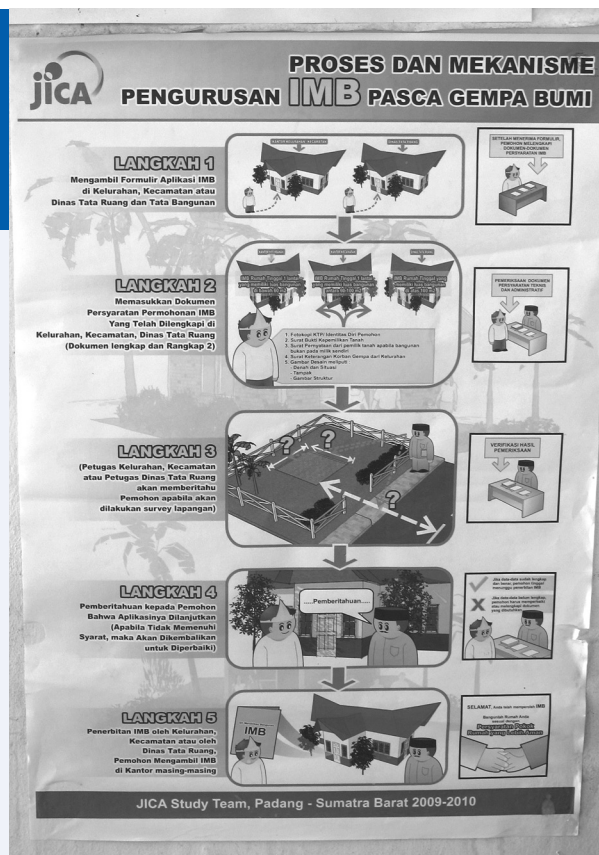
The high level of community organization through the CDCs is a key resource for implementing a public awareness campaign. There is a lack of recognized public spaces and community centers in Unur where a printed campaign would be disseminated.

PROS

Make complicated issues easy for people to understand
 Build sense of community
 Affordable and scalable

CONS

Lack of information kiosks in Unur
 Relies on existing social networks
 Requires follow up



HOUSING SETBACK

CASE: “Stren Kali” Riverbank Communities

LOCATION: Surabaya, Indonesia

HOW IT WORKS

Residents agree to set houses back from water; space between housing and river used for footpath and restoration of river edge.

WHAT THE COMMUNITY HAD TO SAY. . .

The high level of community organization will help to make people aware of and adhere to a housing setback. Local manpower is a resource for adjusting *khashaas* boundaries and *ger* locations. Residents think that many *khashaas* owners will be unwilling to adjust their plot because they lack an understanding of the benefits of flood protection. The short season for outdoor labor is another constraint.

PROS

Residents stay in their location
New public space
Non-structural solution – regulation
– efficient in long-run

CONS

Reconfiguration of *khashaas*
Potential loss of property value
Regulation must be enforced



GABION WALL

CASE: Kibera Public Space, Kounkuey Design Initiative

LOCATION: Nairobi, Kenya

HOW IT WORKS

Stabilizes water edge to reduce erosion; contains water to prevent flooding of adjacent housing. Constructed of stones held within a steel cage.

WHAT THE COMMUNITY HAD TO SAY. . .

This is a solution the community can implement using local skills, manpower, and materials such as stones and tires. *Khashaas* owners need a better understanding of the benefits of this flood protection solution. The short season for outdoor labor is another constraint.

PROS

Affordable
Materials collected locally
Low maintenance

CONS

Only addresses local flooding
Requires maintenance of channel; for example, no dumping
May require dedication of land from adjacent *khashaas*



GULLEY EDGE RESTORATION

CASE: Slum Upgrading Program, Municipal Government
LOCATION: Belo Horizonte, Brazil

HOW IT WORKS

Riverbed or gully restored to natural condition; plantings stabilize river edge to prevent erosion and increase water retention.

WHAT THE COMMUNITY HAD TO SAY. . .

This solution has the potential to improve the community image since it will beautify the area by adding vegetation and reduce dumping. The organized CDCs are a resource for ongoing maintenance of the gullies. There is a need for rubbish collection in the district – residents currently dump in the gullies because there is no other alternative. There is also low precipitation in Ulaanbaatar and a short growing season, which makes it difficult to maintain ground vegetation.

PROS

- Affordable and non-technical
- Beautification
- Prevents erosion

CONS

- Short growing season in UB
- Only addresses local flooding
- Plants must be maintained



STREET DRAINS

CASE: Cooperative Housing Foundation
LOCATION: Beatrice, Haiti

HOW IT WORKS

Storm water drains installed when roads are improved; street drains channel rain and flood water and reduce water pooling.

WHAT THE COMMUNITY HAD TO SAY. . .

This solution is a high priority in the CDCs' existing CAPs and so there is potential to seek support from NGOs and the private sector. Some residents have equipment like trucks and tractors in Unur that could contribute to construction. The high cost of road construction means outside financial support is required.

PROS

- Constructed with local labor
- Reduces damage to street
- Improved access to city services

CONS

- Can be expensive, depending on surface materials
- Must clean drains regularly
- Municipality must maintain roads



FOOTPATH ELEVATION

CASE: Slum Upgrading Program, USAID

LOCATION: Pekalongan, Indonesia

HOW IT WORKS

New paths constructed above flood-level; path paved with rounded surface to drain water away.

WHAT THE COMMUNITY HAD TO SAY. . .

This solution was not evaluated by participants in the workshop.

PROS

Can be constructed in coordination with drainage

Defines pedestrian space

Maintains safe and clear space separate from vehicles

CONS

Large amount of materials

Vehicles must stay off paths

Requires maintenance



HOME ELEVATION

CASE (above): Flood Resistant House, Practical Action

LOCATION: Bangladesh

CASE (below): Elevated House, Make It Right

LOCATION: New Orleans, LA

HOW IT WORKS

Elevates home above anticipated flood levels; constructed with a variety of methods – reinforced concrete columns or earth plinth.

WHAT THE COMMUNITY HAD TO SAY. . .

Locally available materials such as sand, stone, and tires could be used to elevate gers. Elevating gers in this way is not a part of Mongolian tradition and customs.

PROS

Use local earth moving methods

Protects home and possessions

No need to change to *khashaas*

CONS

Ineffective if plinth lower than peak flood level

Only addresses housing

Permanent structures need to be reconstructed



RETENTION BASIN

CASE: “Piscinoes,” Municipal Government
LOCATION: Sao Paulo, Brazil

HOW IT WORKS

Flood water is diverted into series of basins and then gradually released into the drainage system.

WHAT THE COMMUNITY HAD TO SAY. . .

This solution was not evaluated by participants in the workshop.

PROS

- Use local earth moving methods
- Contains the water that the existing system cannot handle
- Can also be used for recreation

CONS

- Large amount of space
- Requires maintenance
- People may build *khashaas* in the basin



RESETTLEMENT

CASE: Bengawan River Resettlement Program,
Municipal Government
LOCATION: Solo, Indonesia

HOW IT WORKS

Assistance to households in floodplain to relocate – cash grant and support finding new plots to purchase. Land in the floodplain redeveloped with recreation uses.

WHAT THE COMMUNITY HAD TO SAY. . .

There already is a resettlement policy in place in Ulaanbaatar, but it is only partially enforced. In addition, the location of available land does not meet the needs of residents because the plots are far from the city center and lack services and infrastructure.

PROS

- Families move to safe areas
- New recreation amenities
- Land available for new gers

CONS

- Expensive
- Regulation must be enforced to prevent new settlements
- People must adjust to new site



TOOLKIT FEASIBILITY TEST

This table summarizes workshop participants' evaluation of the solutions included in this toolkit. Participants were asked to evaluate each tool based on their perception of resources available in the community and barriers to implementation. They then ranked their priorities for tools that are most applicable in their *khoro*.

		GABION WALLS	HOUSING SETBACK	RESETTLEMENT	STREET DRAINS	HOME ELEVATION	PUBLIC AWARENESS	RESTORE GULLEY EDGE	EARLY WARNING SYSTEM
RANK (GROUP #)	High	3	1,4	1,2	2,3	3		1	4
	Medium	1,2,4	2				1,4		
	Low					2,4		3	3
RESOURCES	Organized Community	○	○			○	○	○	
	Manpower / Skills	○	○	○	○				
	Materials (Sand, Stone, Tires)	○				○			
	Equipment (Trucks)	○			○				
	Access to Communications Technology			○					○
	Understanding of Flood Risks and Vulnerability		○						
	Local Gov't Support through Existing Resettlement Policy			○					
	Available Land for Resettlement			○					
	Potential to Partner with Local Gov't / NGOs				○			○	
	Potential for Community Maintenance and Rubbish Collection							○	
	Potential to Improve Community Image								○

		GABION WALLS	HOUSING SETBACK	RESETTLEMENT	STREET DRAINS	HOME ELEVATION	PUBLIC AWARENESS	RESTORE GULLEY EDGE	EARLY WARNING SYSTEM
BARRIERS	High Cost / Lack of Funding Sources	○	○	○	○	○	○	○	○
	Lack of Information about Benefits	○	○		○	○			○
	Unwillingness of Owners to Reduce <i>Khashaas</i> Size	○	○	○				○	
	Climate (short growing / working season)	○	○		○	○			
	Need for Maintenance and Rubbish Collection				○			○	
	No Meeting Place						○		
	Need for Cooperation among Residents						○		
	Available Land for Resettlement Far from City Center			○					
	Available Land for Resettlement Lacks Infrastructure and Services			○					
	Lack of Materials				○				
	Increased Vulnerability to Storms					○			
	Lack of Local Custom and Tradition					○			
	Low Water to Support Vegetation							○	
	People have Different Schedules								○
	Need for Contacts Database								○

ANNEX 2

Workshop Training Module

The following “module” describes the steps for facilitating a flood protection community action planning workshop. The role of the facilitators in the exercise is the following:

- Help workshop participants agree upon which areas of Unur flood and document their input on the aerial map.
- Use the “toolkit” to help the workshop participants test the feasibility of solutions that can reduce vulnerability to flooding in the *ger* areas, and document feedback on flip charts.
- Help workshop participants prioritize flood protection solutions to integrate into CAPs, and document feedback on flip charts.
- Lead a discussion about implementation strategies, and document feedback on flip charts.
- After the workshop, compile feedback from the flip charts and, if needed, translate to English.

WORKSHOP SETUP

WORKSHOP SESSION 1

Flood Protection Community Action Planning (90 minutes)

WORKSHOP SESSION 2

The Institutional Response to the CAP (30 minutes)

MATERIALS

- Aerial map of study area with photos from the area
- Colored markers
- Flood protection “toolkit” (2 copies in Mongolian (and 1 in English, if needed))
- A flip chart with paper
- Facilitators manual

By leading this exercise, we will create a viable methodology for integrating flood protection measures into CAPs at the *khoro* level, which will be documented in Flood Protection Community Action Plans.

STEPS FOR SESSION 1

EXERCISE: Flood Protection Community Action Planning

1. IDENTIFY THE AREAS THAT FLOOD (MAPPING EXERCISE) (15 MINS.)

2. TEST THE FEASIBILITY OF SOLUTIONS FROM THE TOOLKIT (45 MINS.)

3. PRIORITIZE THE SOLUTIONS (15 MINS.)

It is important to keep the discussion moving during each session so that the allotted time can be respected. Use the map and flip chart as a tool for keeping the discussion at a pace – register a comment, discuss it, then move on. Please be strict in regulating the time allowed for each session.

STEP 1: IDENTIFY THE AREAS THAT FLOOD (MAPPING EXERCISE)

Ask the workshop participants to look at the table map. Describe what the map shows:

- Point out landmarks.
- Explain what the grey shaded area means.
- Point out the study area.
- Ask one or two participants to point out where they live.
- Make sure everyone is comfortable and oriented on the map.

The map shows that along the gullies there is an area of five meters on either side which is vulnerable to flooding. We know that there are, in fact, more areas that flood. For example, those areas in the lowest parts of the settlement are flood prone. Ask the participants to use their experiences to complete the picture, invite them to draw (with the markers) the locations of other flood areas.

STEPS FOR SESSION 1 (CONT.)

EXERCISE: Flood Protection Community Action Planning

Participants will likely be reluctant to draw on the map, so you will have to ask them to indicate with their finger where flooding occurs and then draw it yourself – then ask, “Is this correct?” At the end of this exercise we should have a map with the flood areas indicated with a marker.

STEP 2: TEST FEASIBILITY OF SOLUTIONS FROM THE TOOLKIT

Ask the participants to consider the solutions from the toolkit. Take 10 minutes to have them identify which ones are most likely to work in the study area or which ones they think address the problems they experience. There should be about five that they like the most. Write these in a list at the top of the flip chart.

For the next 35 minutes, ask participants to discuss each of the solutions one-by-one, considering the resources that are available and what barriers to implementation there might be. Use the flip chart and the toolkit to write down notes from the discussion. Write down every idea, whether you think it is good or bad.

You will have to ask a series of leading questions to get responses from participants. Whether they are CDC members, government officials, or NGO workers, they will all have different perspectives.

Sample questions to discuss available resources:

- Are there skills among community members that could be used?
- Are there materials in the community that could be used?
- What government programs and agencies can assist?
- What NGO programs are available?

Resources refers to the financial, human capacity, and skills available from the community, local government, or other organizations that can help to implement the project. Building a road, for example, requires construction materials, tools, and engineering support. The community might be able to provide the manpower and tools, while government or donor funding will

have to provide engineering and financial resources.

Sample questions to discuss barriers to implementation:

- What difficulties can you foresee in implementing this project?
- Does the community have the capacity to maintain this project alone? Who else needs to help?
- What materials or tools would be necessary but are not available?
- Does the long winter prevent the implementation of this project since there is only a short window available for construction?

Barriers refers to those factors that would make implementing the solution difficult. It is important to establish whether a solution is feasible in the study area before selecting it for the CAP. For example, building a road would require money that might not be available and require labor during months when it is too cold to work.

You should take 35 minutes to assess the pre-selected five solutions on the flip chart. Start by writing a list of the five or so solutions the participants have selected for discussion. Then divide the chart into two columns – one for resources, one for barriers. Go through each solution, noting the resources and barriers that participants suggest. Write down every idea, but there is no need to write complete sentences – just a couple of words to capture each idea.

STEP 3: PRIORITIZE THE SOLUTIONS

The remaining 15 minutes will be dedicated to prioritizing the solutions as “high,” “medium,” or “low” to identify which are most suitable and desired by the residents of Unur. This exercise is directed to the CDC members in particular.

Write the five or so solutions that were discussed in the previous session. Write the solutions in the left column and reserve the right column for the participants’ priorities.

STEPS FOR SESSION 1 (CONT.)

EXERCISE: Flood Protection Community Action Planning

Go through each solution and ask the participants to consider two questions:

- Which solution reduces vulnerability for the most people?
- Does the solution have other benefits that improve conditions for people?

At the conclusion of the session, the workshop participants should be prepared to present their “high,” “medium,” and “low” priorities and discuss the resources available for implementation and barriers.

STEPS FOR SESSION 2

EXERCISE: The Institutional Response to CAP

STEPS FOR SESSION 2

During session two, workshop participants will discuss next steps for the CAPs. In particular, participants should identify how the CDCs can take the CAPs to local government for implementation. Together with the same groups as before ask the participants to consider each of the three questions, spending about 10 minutes on each:

- How can CAPs be funded?
- How can CAPs be incorporated into the *khoro* plan?
- How can CDCs work with NGOs and the private sector to implement CAPs?

List participant responses on the flip chart.

ANNEX 3

List of GUSIP Publications

The publications were produced as part of UN-HABITAT's Ger-area Upgrading Strategy and Investment Plan between 2007 and 2010. These publications are available in Mongolian translation.

1. CITY DEVELOPMENT REVIEW AND GER-AREA UPGRADING STRATEGY

- City Environment and Development Review
- Service Distribution and Infrastructure Review
- Urban Poverty Profile
- Land Planning and Management Review
- Citywide Pro-poor Ger-area Upgrading Strategy of Ulaanbaatar City

2. GER-AREA UPGRADING GUIDELINES

- Peri-Urban Ger-Area Incremental Upgrading Guidelines
- Middle Ger-area Upgrading Guidelines
- Central Ger-areas Redevelopment Guidelines

3. GER-AREA ACTION PLANS

- Peri-Urban Ger-areas Land Readjustment Action Plan - Ulaanbaatar
- Middle Ger-areas Incremental Upgrading Action Plan - Ulaanbaatar
- Central Ger-areas Redevelopment Action Plan

4. UPGRADING FINANCING STRATEGY

- Urban Investment and Financing Review & Cost Recovery Review
- Institutional Review, and MUB Financial Management Review
- Ger-area improvement financing strategy

5. TOOLKITS

- Sustainable Cities – Approaches and Processes
- Participatory Urban Development Decision
- Community Action Planning
- Community Contracting

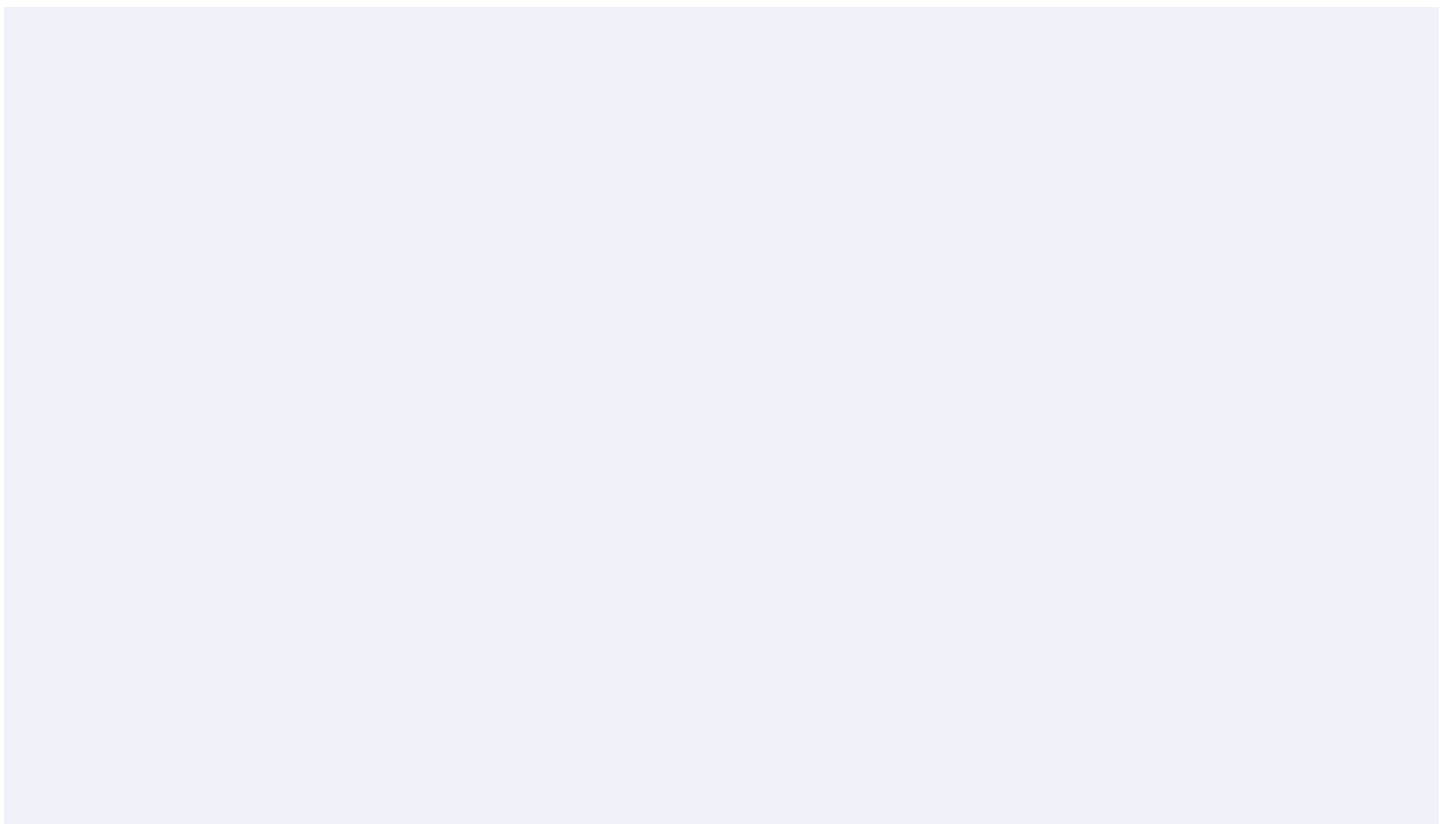
6. DISSEMINATION AND REPLICATION

- GUSIP Pamphlet
- Institutional and Policy Reform Brief
- Up-scaling and National Replication Strategy
- Planning for Disaster Risk Reduction in Ulaanbaatar - Unur Area Community Action Plan



GUSIP CLOSING WORKSHOP

The community action planning workshop was preceded by a dissemination seminar that featured a panel with UN-HABITAT, Japan International Cooperation Agency (JICA), the World Bank, and the Municipality of Ulaanbaatar.



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