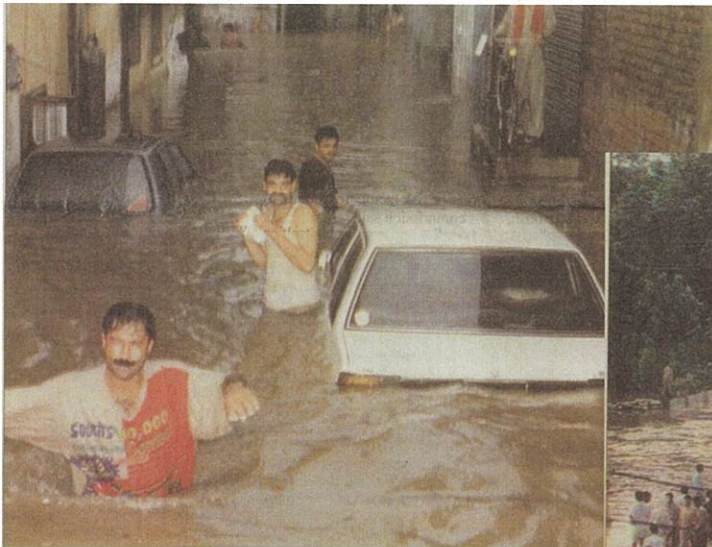


THE PROJECT FOR THE IMPROVEMENT OF THE FLOOD FORECASTING AND WARNING SYSTEM FOR LAI NULLAH BASIN

Under Japan's Grant Aid Program

THE PROJECT FOR STRENGTHENING OF FLOOD RISK MANAGEMENT IN LAI NULLAH BASIN

Under JICA Technical Cooperation Program



Federal Flood Commission, Ministry of Water and Power



Pakistan Meteorological Department



City District Government Rawalpindi



Punjab Emergency Services (Rescue 1122) Rawalpindi



Tehsil Municipal Administration of Rawalpindi



Water and Sanitation Agency, Rawalpindi



Japan Official Development Assistance



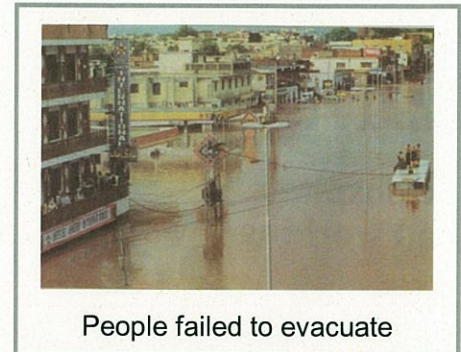
Japan International Cooperation Agency

1. Background

The Lai Nullah Basin has a catchment area of 234.8 km², extending to the twin cities of Islamabad and Rawalpindi. The Lai Nullah Basin receives heavy rainfall averaging 600 mm in the monsoon season (July-September) every year, which normally leads to heavy flood discharge.

2. The 2001 Flood

On July 23, 2001, an unprecedented rainfall occurred over Islamabad-Rawalpindi resulting in 620 mm of rain in a span of about 10 hours. The flood had caused the worst damage in the basin including death of 74 people and the complete or partial destruction of about 3,000 houses.



3. Scope of the Project

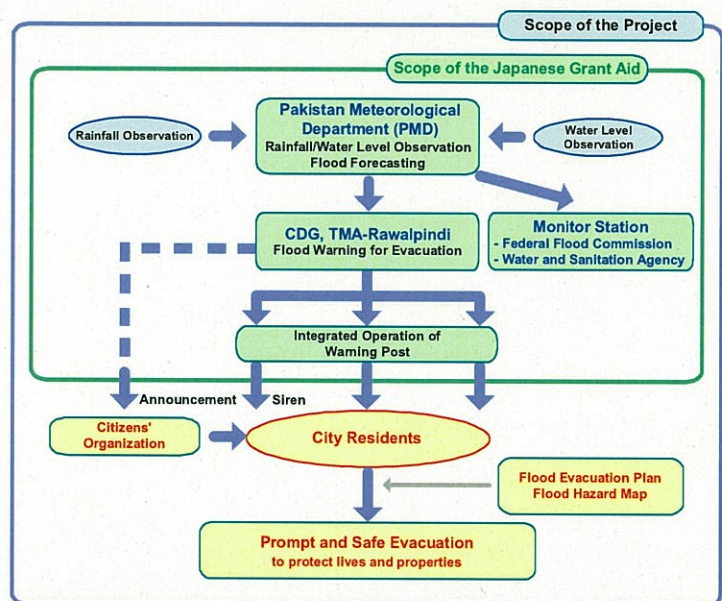
The overall goal of the "Lai Nullah Flood Forecasting and Warning System Project" is to mitigate flood damage, particularly, death and injury to residents in the capital region.

(1) Construction and Installation

Two Water Level Gauging Stations and newly two Rainfall Gauging Stations have been constructed. And then, the equipment and facilities of the Flood Forecasting and Warning System (FFWS) have been installed. The O&M of FFWS was operating since April 2007.

(2) Technical Guidance Service

The project includes technical guidance service, so called "Soft Component". The activities required for the smooth start of operations and the sustainable execution of O&M of the system became possible through the technical guidance services on fundamental knowledge and techniques to be provided.



Relationship between the Project and Japan's Grant Aid

4. Outputs of the Project

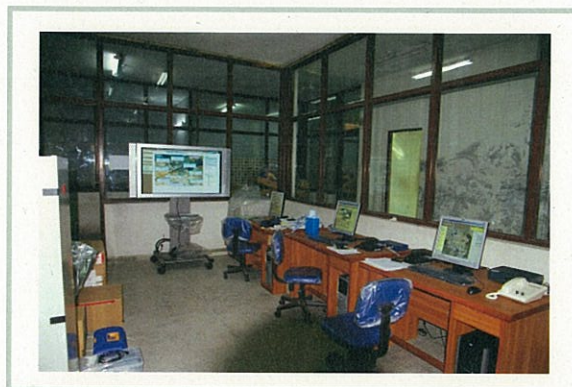
- (1) Real-time and accurate observation of rainfall/water level is possible and data are automatically recorded.
- (2) Flood can then be forecasted before river bank overflow.
- (3) Ten (10) Warning posts cover the inundation area and blow the siren along the Lai Nullah River.
- (4) Prompt and integrated warning operation is possible.
- (5) Staffs of agencies concerned in operation and maintenance have been trained through the technical guidance services.

5. The Facilities and the Equipment installed under the Project

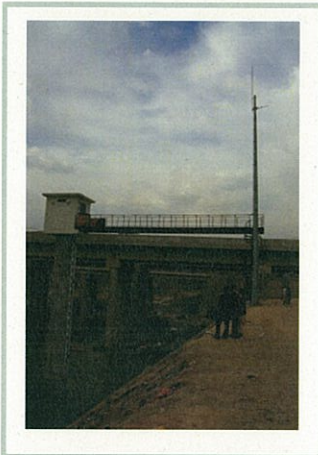
The following facilities and equipment have been installed under the Japan's Grant Aid.



▲ Master Control Centre

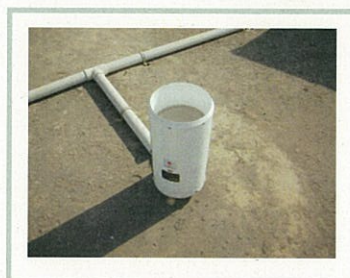


▲ Disaster Prevention Control Centre

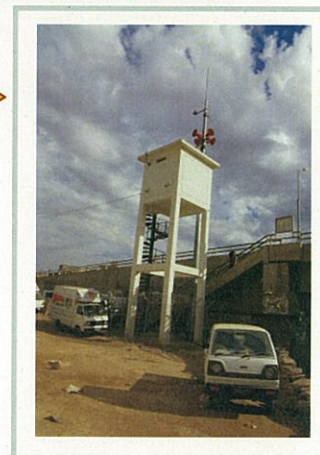


◀ Water Level Gauging Station

Flood Warning Post ▶



▲ Rain Gauge



Station	Function	Organization in Charge
1. Master Control Centre		
1.1 Pakistan Meteorological Department (PMD), Islamabad	<ul style="list-style-type: none"> Flood forecasting; Data collection Data processing Dissemination of flood information to related agencies (Data transmission subsystem) 	PMD
2. Rainfall Gauging Station		
2.1 PMD, Islamabad	Automatic rainfall data observation (Telemetry subsystem)	PMD
2.2 Saidpur		
2.3 Gorda		
2.4 Bokla		
2.5 RAMC		
2.6 Chaklala		
3. Water Level Gauging Station		
3.1 Kattarian Bridge	Automatic water level data observation (Telemetry subsystem)	PMD
3.2 Gawal Mandi Bridge		
4. Repeater Station		
4.1 RAMC Telemetry Repeater	<ul style="list-style-type: none"> Repeater function for telemetry Repeater function for wireless LAN 	PMD
4.2 RAMC Wireless LAN Repeater		
5. Monitoring Station		
5.1 FFC	Flood information monitoring (Data transmission subsystem)	FFC
5.2 WASA of RDA	Flood information monitoring (Data transmission subsystem)	WASA of RDA
6. Flood Warning Control Centre		
6.1 TMA Rawalpindi: -- Warning Control & Supervision -- Flood Information Monitoring	Control and supervision of warning system Flood information monitoring (Data transmission subsystem)	CDGR/Rescue1122
7. Flood Warning Post		
7.1 WP-1: TMA Rawalpindi 7.2 WP-2: Christian Colony 7.3 WP-3: Water Treatment Facility adjacent to MC 7.4 WP-4: Ratta Amral Bridge 7.5 WP-5: Gunj Mandi Bridge 7.6 WP-6: Pir Wadhai Bridge 7.7 WP-7: Fire Station Pir Wadhai 7.8 WP-8: Sector IV-B, Khayaban Park 7.9 WP-9: Gawal Mandi Children's Park 7.10 WP-10: Government Middle School, Dhoke	Flood evacuation warning by motor siren and loudspeaker	CDGR/Rescue1122

6. Sustainability of the Project

In order to maintain the sustainable development after the completion of the Project, it is necessary to develop the Engineer's ability, Awareness Program and Public Involvement. Upon the request of the Government of the Islamic Republic of Pakistan, for the purpose of working out the details of the technical cooperation program concerning, **the Project for Strengthening of Flood Risk Management in Lai Nullah Basin** was approved for the implementation between the two Governments and signed on 30 August 2007.

7. Basic Policy of the JICA Technical Cooperation Project

- (1) Overall Goal: Flood damage and victims are mitigated in the target area.
- (2) Project purpose: System and structure which enables mass evacuation at the event of floods is established in the target area.
- (3) This project proposes three (3) outputs as following.

- Output 1: Capacity of PMD is strengthened enough to utilize flood early warning system effectively and issue warning properly.
- Output 2: Capacity of local authorities is developed enough to promote people's awareness and preparedness for the floods.
- Output 3: Capacity of related organizations is strengthened enough to mitigate the damage of flood.

(4) Project Period:

The Project execute among twenty-five (24) months from December 2007 to November 2009 is divided by two (2) Phases.

Phase I : Twelve (12) moths From December 2007 to November 2008

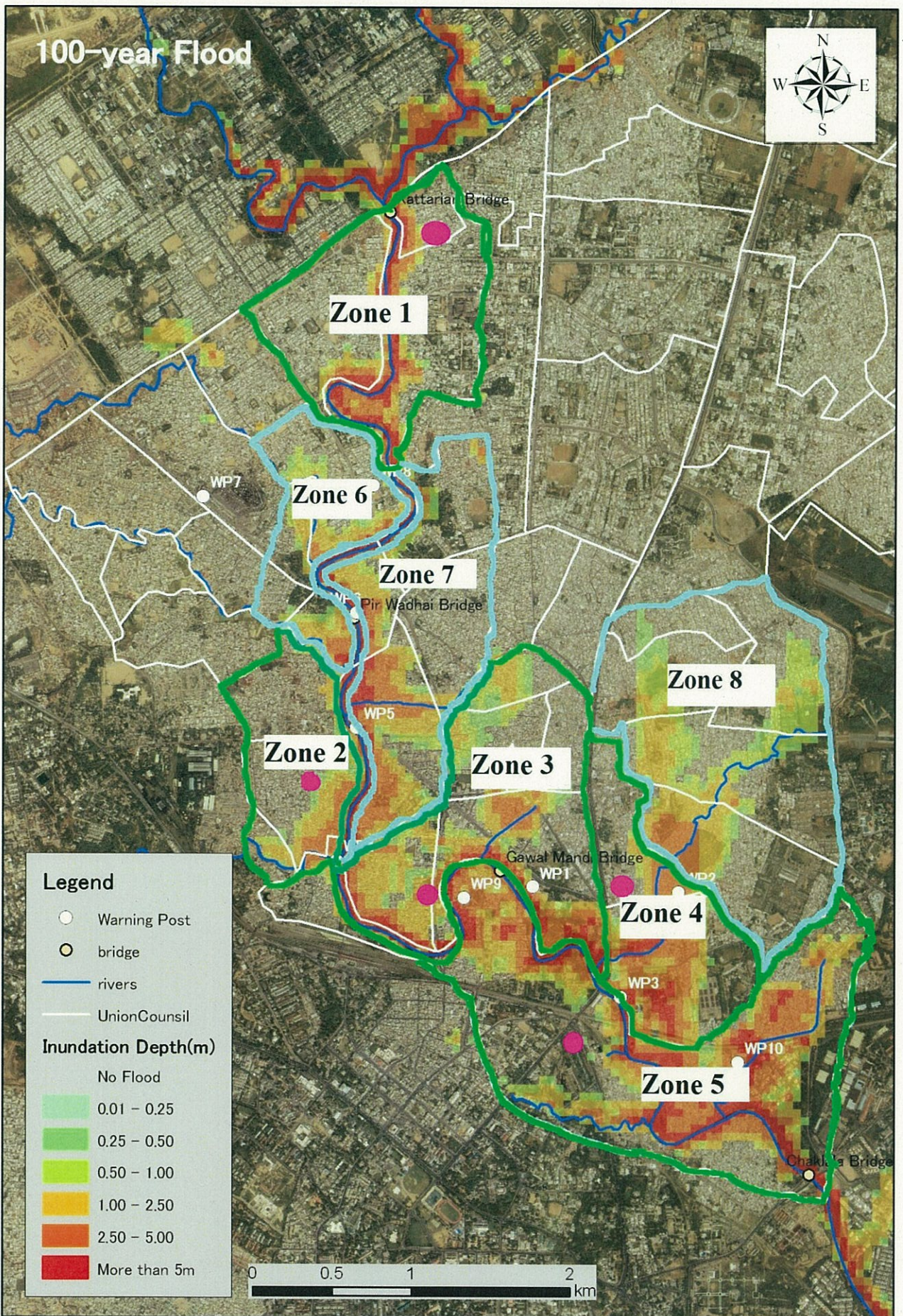
Phase II : Twelve (12) moths From December 2008 to November 2009

Term	07	2008												2009											
	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Phase	← Phase I →												← Phase II →												
Report	▲ IR						▲ PR(1)						▲ IT							▲ PR(2)				▲ DF	

Legend: IC: Inception Report PR: Progress Report IT: Interim Report
DF: Draft Final Report F: Final Report

Zoning for Target Area and Selected a Pilot Area

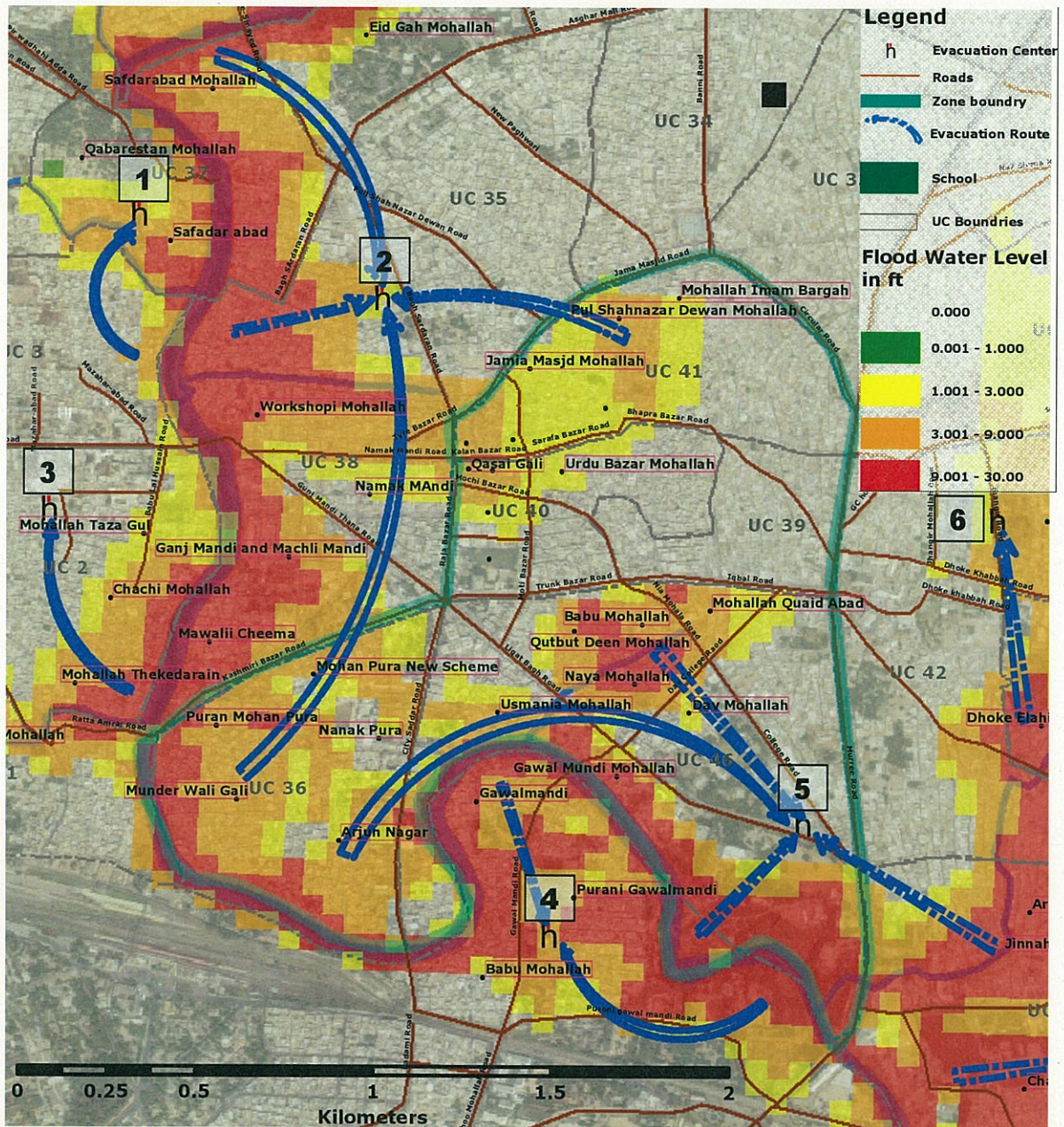
The information of obstacles and hazardous places will be collected and reflected to the Hazard Map. During the awareness program and evacuation drills for residents, Hazard Map will be evaluated and improved for serve the purpose. Zoning for target area and draft hazard map for zone 3 are shown below.



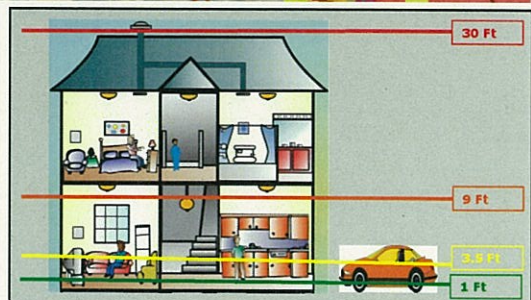
Zoning of Target Area

8. Hazard Map for Zone 3 (UC 36, 39, 40, 41 and 46)







Flood hazard map is made aiming at prevention of personal suffering by plainly offering to the residents about flood and evacuation information. This map shows the simulated inundation area and depth of the flood in July 2001 and also provides the information of Evacuation center in each area. For residents, please use it for daily preparedness against floods and evacuation activities such as confirmation of inundation situation around your house and Evacuation center for your family in this map.



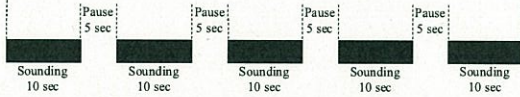
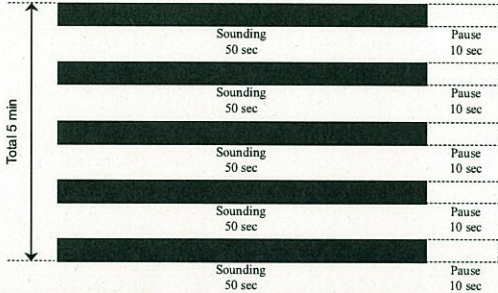
1. Govt. Girls High School
2. Govt. Girls Higher Secondary School No1
3. M.C. Boys High School
4. F.G. Boys High School
5. Govt. Islamia High School
6. Municipal Corporation Boys Central Model High School













Photos of Evacuation Centers

 <p>1. Govt. Girls High School</p>	 <p>2. Govt. Girls Higher Secondary School No.1</p>	 <p>3. M.C. Boys High School</p>
 <p>5. Govt. Islamia High School No.4</p>	 <p>4. F.G. Boys High School</p>	 <p>6. Municipal Corporation Boys Central Model High School</p>

When you hear this siren,

Stage	Siren Patterns and Announcements	What should you do?
Flood Alert Warning	<p>Total 70 sec.</p>  <p>* Before the siren, there will be an announcement</p>	<p>Prepare to be able to evacuate at any time!</p> <ul style="list-style-type: none"> ✓ Preparation of emergency goods ✓ Confirmation of evacuation center ✓ Confirmation with family of communication procedure in emergency ✓ Moving household goods to upstairs ✓ Old person should prepare to evacuate earlier
Flood Evacuation Warning	 <p>Total 5 min</p>	<p>Put out fire and lock doors, and evacuate to evacuation center with emergency goods.</p>
All clear	Announcement from speaker and government officers	You may go home

Check List for Emergency Goods

<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

Preparedness on daily basis

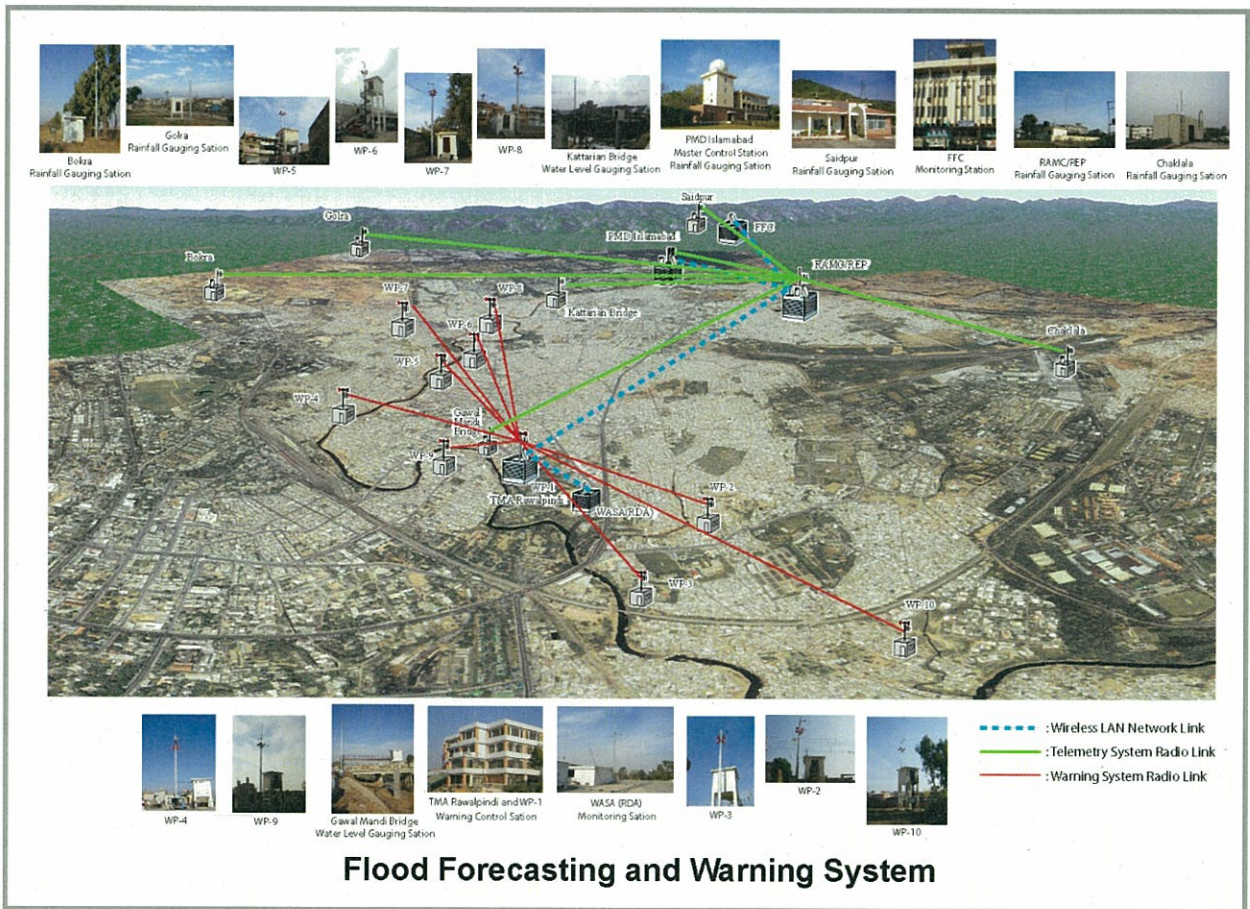
- Flood situation around your home
- Location of evacuation center for your family
- Communication means of family in emergency
- Contacts address in emergency
- Siren patterns for warnings
- Expected inundated area, hazardous places on the evacuation route
- Preparation of emergency goods

When a heavy rain begins,

- Pay attention to the weather information
- Pay attention to siren and announcement for Warnings
- Early evacuate (evacuate before you feel danger)
- Get out from basement
- The water level of Lai Nullah is rising drastically

When you evacuate,

- Check the latest weather information constantly
- Put out fire and lock doors
- Keep away from river and bridge
- Avoid to evacuate alone, evacuate with family and neighbors
- Pay attention to street drain and ditch
- Avoid use of car
- Preserve discipline in evacuation center



Contact

Operation and Maintenance	In Emergency	
Federal Flood Commission 16-D, Safder Mansion, Blue Area, Islamabad, Pakistan Ph: 051-9206589, Fax: 051-9224991 E-mail: pakfloodcommission@hotmail.com	Weather Information PMD	9250363 9250364
	Information for Evacuation Center CDGR Revenue	9270774
Pakistan Meteorological Department Headquarters H-8/2, Islamabad Ph: 051-9250367, Fax: 051-9250368 Web site: http://www.pakmet.com.pk/nl/index.htm	First Aid Post CDGR Health	4831965
	Contact in Emergency Police Rescue1122 Fire Fighting Civil Defense Gas (Sui Gas) Electricity (IESCO) Water (WASA)	15 1122 16 9270698 119 118 5541542
Town Municipal Administration Rawal Town, Liaquat Bagh, Rawalpindi Ph: 051-9224649, Fax: 051-5774310	Union Council UC36, Sohail Ahmed UC39, Malik Anjun Farooq UC40, Haider Ali UC41, Syed Sukhair Hussain UC46, Malik Shakeel Awan	051-5557543 051-5550385 051-5555044 051-5577151 03215177080
Water and Sanitation Agency Rawalpindi Development Authority, Rawalpindi Ph: 051-5554531, Fax: 051-5539490		
City District Government, Rawalpindi District Coordination Officer, Near District Court Rawalpindi Ph: 051-9270677, Fax: 051-9270687		
Rescue 1122 Murree Road, Link Rawal Road, Rawalpindi Ph: 051-9290121, Fax: 051-9291186		

Consultant:
Contractor:

CTI Engineering International Co., Ltd.
 Mitsubishi Corporation, Japan Radio Co., Ltd., Tobishima Corporation
 (for Japan's Grand-Aid Project)