



**Ministry of Interior
Joint Crisis Coordination Center**

**Aftermath of the Earthquake
Hit Kurdistan Region-Iraq
on 12 November 2017
Emergency Response and Humanitarian
Coordination and Damage Assessment**

Report No. (13), December 2017

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1. Executive Summary:

On 12 November 2017, Kurdistan Region of Iraq (KRI) experienced three consecutive earthquakes between 20:30 -21:30 Erbil time, first one occurred at 20:18 in the magnitude of approximately 4.5, second one; with a stronger magnitude of 7.2 at 21:18, and the third one; 4.6 at 21:28, according to the KRG's General Directorate of Meteorology and Seismology (GDMS).

The epicenter of the earthquake was in Iran, approximately 32 km from the Halabja governorate in the KRI. The eastern south of Slemani and Halabja governorates were severely affected and the earthquake also was felt in Erbil, Duhok, Mosul and Salahaddin governorates with lesser degree. The most affected areas included Darbandikhan, Halabja and Garmiyan administration. The estimated figure of the population impacted with varying degrees is (640,000) as such; Halabja (140,000), Darbandikhan (50,000) and Garmiyan (450,000).

The earthquake has led to human casualties and severe damages to the private, public institutions, and houses, livestock, critical societal infrastructure, including water networks, electricity grids, health facilities, and schools, as well as roads and Darbandikhan dam. The most severe damages were recorded in Darbandikhan district. **The estimated funds required to repair the damages inflicted by the earthquake is (370 billion Iraqi Dinners) and it is around (312 Million USD). The Kurdistan Regional Government has allocated (2.46 billion Iraqi dinners) to repair and renovate the services including water, electricity, hospitals, schools and the Dam.**

The Iraqi government announced that the cabinet has decided to allocate 3 billion Iraqi dinners to repair the Darbandikhan dam and to compensate the affected families. A joint team from the secretariat of the council of ministers and relevant ministries visited the affected areas to assess the situation, however, until now no funds have been sent to the affected areas.

The data presented in this report is assessed and collected directly by the JCC's Crisis Response office in Slemani and the local administrations in the affected areas. The Joint Crisis Coordination Centre has facilitated, reviewed and reassessed the data to ensure accuracy and relevance.

2. Emergency Response and Humanitarian Coordination:

On the set of the disaster, the KRG's Joint Crisis Coordination Centre (JCCHQ), Slemani Crisis Response office led the coordination and response efforts to help the governorate, the local municipalities, civil defense and police and security in order to respond quickly to rescue the lives of the civilians who were affected.

JCC continues to lead the coordination and facilitation such as the response and custom clearances for the assistance sent by partners . JCC mobilizes available resources to support the local authorities in the affected areas. Crisis Response office in Slemani as a leading agency, works closely with local authorities and partners, to provide the required assistance, including dispatch of medical staff, medicine, food, and non-food items, tents to the affected people. The response until the draft of this report included:

2.1 Food:

- JCC's Office in Slemani aided the affected families with food, shelter and medical needs.
- MoDM office in Slemani in close cooperation with JCC-Slemani continues to distribute food and NFI to the families across the affected areas.
- The Turkish Red Crescent provided food and NFI to the affected families in Darbandikhan and some of the affected villages.
- OCHA's Cluster partners distributed food to 196 households in Bamo
- Hot meals are being delivered to the hospitals and students' dormitory in Halabja.
- The Iraqi Red Crescent in cooperation with Kuwait Red Crescent provided 500 food baskets.

2.2 Shelter:

- Total (2218) tents distributed in all affected areas; (282 Darbandikhan, 303 Bamo, 684 Garman, 400 Sirwan, and 283 Halabja).
- The Turkish Red Crescent deployed a team from Erbil immediately after the earthquake to assess damage and to provide shelter assistance, including (10 disaster vehicles, 98 personnel, 3000 tents, 3000 heaters, 10,000 blankets, 10,000 beds and one mobile kitchen).
- Italian Consulate in Erbil has sent three planes of humanitarian assistance; the planes were loaded with tents, blankets, and latrines and medical aids.
- Islamic Relief has sent 150 tents and the shipment arrived in Ibrahim Khalil border and been cleared by JCC and directly transported to Slemani.
- 503 tents have been distributed in Maydan villages and they received another 400 tents.

- MoDM distributed 200 tents in Darbandikhan and 100 in Qoratw village.
- The Turkish Disaster and Emergency Management Presidency (AFAD) provided 60 tents in Darbandikhan town.

2.3 Health sector:

- Health Directorate in Slemani mobilized all its ambulances and teams to transfer the injured people and treat them at the emergency hospitals.
- WHO sent two ambulances, an Immediate Response Team, trauma and surgical kits to support hospitals in Slemani.
- Aspen company and the International Medical Corps have also sent medical teams to Slemani to provide support.
- The Turkish Disaster and Emergency Management Presidency (AFAD) immediately deployed a medical team that has provided assistance in Slemani and Halabja.
- IOM deployed a medical mobile team for three days to Sharazoor, Kani Bardina and Warmawa district in Halabja to provide medical assistance to affected families. The team provided primary health consultations for adults and children, and tests, treatment and medication for chronic diseases such as diabetes and asthma. Fewer cases needing further treatment were referred to Slemani hospital and to Halabja hospital – the latter was also damaged during the earthquake.
- An OCHA-led inter-agency assessment team sent on 13 November to assess humanitarian needs in Darbandikhan, Slemani and Halabja. And they met with the Mayor and Director General of the Health department, also visited the main hospitals, affected areas.
- European Commission Humanitarian Aid (ECHO) in Erbil, has responded and sent ambulances, medicines and medical teams.
- PWJ is planning to renovate the Maternity Hospital in Halabja but not confirmed yet.
- Halabja, new Halabja (Sharazoor) and Darbandikhan hospitals has been assessed by WHO and in coordination with the DOH, they will provide needed assistance based on the assessment's outcomes.
- Four tents were provided to Darbandikhan hospital, one to Halabja Emergency Hospital and 3 surgical trauma kits to Slemani Hospital immediately after the EQ.
- UNFPA deployed one gynecology mobile clinic in Shahid Azadi Mama Alaa primary health clinic (PHC), the only functioning health facility in Darbandikhan. The UNFPA team also distributed medicines and reproductive health kits as well as dignity kits to more than 500 women and girls in the areas and provided psychosocial support to traumatized women in Darbandikhan.

- DOH requested WHO to provide Darbandikhan hospital with 6 prefab, and requested IOM's support in rehabilitation of the hospital of Darbandikhan. Both UN Agencies are in discussion with their HQs in response to these requests.
- Through DOLSA, mobile teams visited communities and schools those severely affected by the earthquake, reaching an estimated 1, 000 children and providing specialized psychosocial first-aid to 55 children in Darbandikhan.
- The Iraqi Red Crescent in cooperation with Kuwait Red Crescent provided 1,000 health kits.
- IMC has deployed a medical emergency team consisting of 1 doctor, 2 nurses and a pharmacist to provide tests and treatments for those affected by the earthquake.

2.4 Education sector:

- KRG provided (160 million) Iraqi Dinars to renovate the damaged schools in (Slemani, Halabja, Garmyan and Darbandikhan) districts.
- UNICEF conducted a separate school-focused assessment to determine if specific education assistance is required in Halabja and Darbandikhan.
- The UNOCHA's education cluster will be providing alternative learning space (tents or caravans) to heavily damaged schools.
- A team of engineers from the department of education and UNOCHA's cluster partners has been established to undertake a comprehensive assessment of 11 schools that are at high risk of collapse to Halabja, Darbandikhan, Sharazoor and Said Sadiq.

2.5 Public Facilities:

- KRG Prime Minister and Deputy Prime Minister accompanied by a ministerial delegation visited Darbandikhan town, Dam and other affected areas to see the situation and to meet with the local authorities. KRG has allocated (2.46) billion **Iraqi dinars to the affected areas as detailed below:**
 - a) 100 million for Slemani governorate for immediate response**
 - b) 100 million for Halabja governorate for immediate response**
 - c) 100 million for Garmiyān Administration for immediate response**
 - d) 160 million to repair and renovate the schools in Slemani, Halabja, Garmiyān and Darbandikhan.**
 - e) 1 Billion to repair and renovate the public services in Darbandikhan**
 - f) 1 billion allocated to repair the damages inflicted to the Darbandikhan Dam.**

- Mountain rockslides which blocked the Darbandikhan tunnel were cleared and the road was opened the night after the incident.
- United Nations Disaster Assessment and Coordination (UNDAC) team, two members who are highly specialized in natural disaster management arrived to KRI in support of the response efforts of the local authorities to make an assessment of the damages to the Dams. The assessment has been finished and a report has been submitted.
- The European Civil Protection Mechanism has been activated upon request from UNOCHA for expertise - dam integrity/ structural engineer experts to assess two affected dams in Slemani Governorate, Iraq (Darbandikhan and Dukan). Two experts joined the UNDAC Team.
- The Copernicus Satellite Emergency Management Service has been activated for 4 areas of interest in Iraq, including the areas that the UNDAC-associated UCPM experts will be deployed to assess. As of 17 November, four reference maps and four grading maps produced and shared with partners.
- OXFAM supports the Directorate of water in Garmyan to provide water trucking to the affected villages.
- After assessing the damages to the water and the electricity networks, UNDP has requested Bills of Quantity for necessary intervention on water and electricity networks in Darbandikhan and for the water plants in Halabja and Darbandikhan.
- WASH assessment was conducted in Darbandikhan, Kalar and Halabja by different WASH partners.
- One WASH partner provided fuel to support water trucking in four villages in the Maidan sub-district.

2.6 Other aids

- DFID through Cash Consortium for Iraq (CCI) provided cash for 200 households, their houses were affected by the earthquake and they were unable to return.
- UNICEF (through DoLSA) distributed winter clothes to 365 children in Bamo sub-district villages.
- In Darbandikhan 80 families identified as eligible for cash assistance, 98 in Bamo.
- MoDM has sent 2,600 relief baskets and distributed among families affected by the earthquake. The aid included food and health baskets, heaters and cookers, oil and gas cookers, cabinets as well as mattresses, blankets and tents.
- The Qatar government sent a humanitarian aid plane, including blankets, medicine, tents and food items.

3. Damage Assessment of the Earthquake:

The earthquake led to human casualties and severe damages to the private, public institution, Health, and Education sectors. The most damage was registered in Darbandikhan district.

3.1 Human Casualties:

Location	No. of Injuries	No. of Deaths	Total
Darbandikhan	70	4	74
Halabja	160	2	162
Garmyan	95	3	98
Slemani	56	/	56
Erbil	58	/	58
Penjwen	10	/	10
Chamchamal	20	/	20
Khanaqin	44	/	44
Total	513	9	522

3.2 Houses and Livestock:

Houses damaged:

Location	Collapsed	Severely Damaged	Partially Damaged	Estimated Cost (IQD)
Darbandikhan	46	617	1,400	7,030,000,000
Halabja	City Center	/	253	782,340,000
	Bamo	1	171	501,500,000
	Khurmali	/	16	23,110,000
	Byara	/	143	76,600,000
	Sirwan	1	78	302,600,000
Garmyan	Kalar	42	/	140,644,000
	Rzgari	19	/	104,105,000
	Bibaz	5	/	6,000,000
	Qortu	91	/	372,390,000
	Maydan	754	/	1,573,900,000
Sharazoor	21	/	46	235,200,000
Qaradagh	32	/	/	17,700,000
Total	1,012	617	2,107	11,166,089,000

Livestock:

Location		Animal Barns/ Poultry	Dead Livestock	Estimated Cost (IQD)
Darbandikhan		169	293	/
Halabja	Bamo	12	/	19,000,000
	Byara	2	/	2,000,000
	Sirwan	2	41	14,250,000
Garmyan	Qoratw	30	63	61,520,000
Sharazoor		2	/	2,400,000
Total		217	397	99,170,000

3.3 Health Sector:

Location	Partial Damage	Renovation Estimated Cost
Darbandikhan	-General Hospital.	/
	- Shahid Tofiq Hospital.	500,000,000
	- Residential building of doctors.	850,000,000
	- Shaheed Hameed Center	500,000,000
Halabja	- Halabja General Hospital.	25,214,880,000
	- Halabja Maternity.	19,350,000
	- 4 PHCs in the city center	141,700,000
	- Kokoiy Health Center	7,920,000,000
	- Halabja Maternity.	8,136,000,000
	- Emergency Hospital.	1,440,000,000
	- Shahed Faraj Dental Center.	3,408,000,000
	- Multidisciplinary consultation center.	2,682,240,000
	- Imam Health Center.	524,640,000
	- Shahed Amjad Haj Al- Ghali.	1,104,000,000
Garmyan	- Oxygen system in both Emergency and General Hospital.	/
Sharazoor	- Shahid Sardar Muhandis's.	/
	- Kani Bardina PHCs (%30).	/
	- Shahid Rauf Bag General Hospital (%70)	/
Slemani	- Maternity Hospital.	/
Raparin	-Dialysis Center (Kidney center).	/
	- Maternity department.	/
	- General medical store.	/
Total		52,440,810,000

3.4 Education Sector:

Location	Highly Damage	Partial Damage	Renovation Estimated Cost (IQD)
Darbandikhan	2 Schools	/	4,200,000,000
	/	17 Schools	800,000,000
	Technical institution.		118,270,000
Halabja	5 Schools	/	280,184,400,000
	/	19 Schools	392,000,000
Garmyan (Kalar)	17 Schools.		346,000,000
Garmyan (Maydan)	2 Schools.		43,000,000
Sharazoor		12 Schools.	512,328,000
		College of Education	/
Slemani	15 Schools in East & West.		/
Dukan		3 Schools	/
	2 Schools		2,200,000,000
Saeed Sadiq	18 Schools.		185,459,500
Total			288,981,457,500

3.5 Water:

Location	Level of Damage	Renovation Estimated Cost (IQD)
Darbandikhan	Partial Damages	570,000,000
Halabja		264,000,000
Garmyan		73,000,000
Total		907,000,000

3.6 Electricity:

Location	Level of Damage	Renovation Estimated Cost (IQD)
Darbandikhan	Partial Damages	350,000,000
Halabja		1,814,900,000
Garmyan		123,506,000
Total		2,288,406,000

3.7 Public Facilities:

Public Places			
Location	Damage	Estimated Cost (IQD)	
Darbandikhan	- Darbandikhan dam.	/	
	- Darbandikhan tunnel.	/	
	- Holy Places.	240,000,000	
	- Darbandikhan motel.	10,000,000	
	- Darbandikhan Palace Hotel.	900,000,000	
	- Sport center.	1,000,000,000	
Halabja	City Center	- Halabja Monumental.	950,000,000
	Sirwan	- Two Mosques	20,500,000
	Khormal	- Mosque Tower	45,000,000
	Bamo	- Two Mosques	8,000,000
- Highway and Bridges		8,000,000	
Garmyan	- Courts	/	
	- Public library.	/	
	- Mosques.	/	
	- Sherwana castle.	110,000,000	
	- Highway & Bridges.	950,000,000	
	- Events Hall.	1,200,000	
Sharazoor	- Mosque	9,600,000	
Total		4,252,300,000	

Governmental Facilities:		
Location	Partial Damage	Estimated Cost (IQD)
Darbandikhan	-12 Institutions	150,000,000
	-Municipality Directorate, gym and warehouse	240,000,000
	-Darbandikhan Police Station	40,000,000
	- Directorate of Education	50,000,000
Halabja	-General Directorate of Health	264,756,240
	-General Directorate of Education	3,333,936,200
	-Presidency of Halabja University	76,400,000
	-Directorate of Public Welfare and Social Development	44,000,000
	-Directorate of Housing and Construction	640,200,000

		-Directorate of Water and Sewage	382,705,000
		-Directorate of Retirement.	8,000,000
		-Khurmal Civil Defense	100,000,000
		-Directorate of Culture and Arts	20,000,000
		-Directorate of Endowments and Religious Affairs	334,300,000
		-Technical Institute	60,000,000
		-Provincial Directorate of Bamo	848,835,000
		-Provincial Directorate of Khurmal	45,000,000
		-Provincial Directorate of Byara	20,000,000
		-Directorate of Travel and Tourism	160,000,000
		-Halabja Police Directorate	10,000,000
		-Directorate of the Treasury of Halabja	2,500,000
		-Irrigation Directorate	170,000,000
		-Roads and Bridges Directorate	115,000,000
		-Halabja Electricity Directorate	684,900,000
		-The Monument Directorate.	500,000,000
		-The Presidency of Halabja Municipality	45,000,000
		-Khurmal Public Library	45,000,000
		-Khurmal Police Station	300,000
		-Compound of Directorates	400,000,000
		-Halabja Notary	150,000
Garmyan	Kalar	- Public Bureau	490,700,000
		- Directorate of Education	389,000,000
		-Police Directorate	9,000,000
		-Emergency Police Directorate	1,000,000
	Maydan	-Shekh Tawil Security Station	50,000,000
		-Compound of Directorates	14,500.000
Sharazoor	-Directorate of Social Surveillance	/	
	-Police Station	/	
	-Directorate of Municipality	/	
	-Directorate of Education	/	
	-Directorate of Electricity	/	
Borders	-10 Police stations	/	
Total			9,745,209,440

4. Darbandikhan Dam:

The rapid assessment of the Darbandikhan dam undertaken by the UNDAC team's Hydro-Structural Engineer and generously deployed through the European Union's Civil Protection Mechanism, concluded that the dam has sustained damage of its exterior but no damage to its core was observed. The dam was designed to sustain this magnitude and intensity of earthquakes. The assessment concluded that the dam can be considered safe for the continued retention of water and there is no immediate risk of a sudden failure in the short-term. However, the earthquake did reveal a weak zone, which constitutes a risk factor for the long-term safety of the dam. Several Recommendations made for further technical testing to determine the long-term integrity of the dam:

1. **Drill three to four piezometer holes to determine if there is any seepage:** It is advisable to drill three to four piezometer holes at the lowest point downstream and from the edge of downstream face access road. These holes can help reveal if there is significant water circulation at the dam rock-fill foundation coming from the clay core spillway interface.
2. **Conduct water sampling to determine the source and path of water:** It is recommended that a comparative analysis of reservoir water and water collected from the foundation drain holes (on mineral content) be carried out. This analysis will show the sources of the drained water and the zones that have been penetrated by water.
3. **Address right bank landslide through re-enforcement:** a common solution for the long-term stabilization of a landslide area is to add more weight to the toe of the slope. Given the proximity of the slip area to the power intake structure, irrigation outlets and spillway, consideration should be given to the placement of interlocking pre-cast concrete blocks to load the toe area. Continuous observation of this zone is mandatory. In the short term, cracks that allow rainwater to seep through must be repaired immediately.
4. **Stabilize rock falls:** although significant areas of the right abutment have already had rock stabilization measures applied, potential rock falls can be easily identified and appropriate stabilization measures have to be continued, including the installation of rock fall barriers. Scaling of potentially loose rocks followed by installation of rock barriers should be performed as a matter of priority.
5. **Risk assessment and preparedness planning for population downstream:** an assessment must be carried out to determine the risk to the population living downstream in the case catastrophic failure. An emergency preparedness plan for the area downstream of the dam should be established. There should be alert mechanisms and (self-) evacuation plans in place to ensure the safety of the population downstream for up to 100 km. This failure could be associated with a major earthquake or dam overtopping.