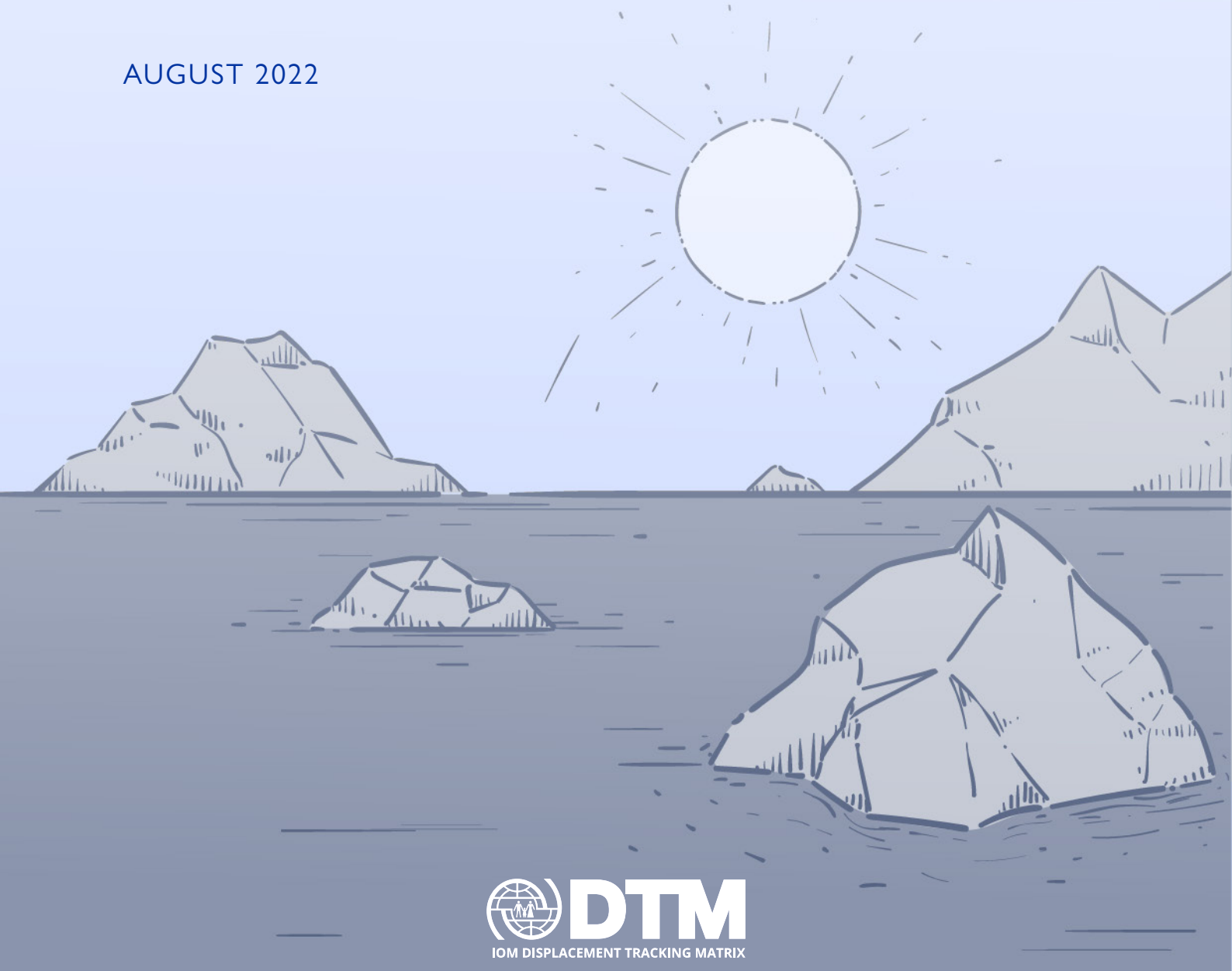
INTEGRATED LOCATION ASSESSMENT VII

FACTSHEET: THE IMPACT OF CLIMATE CHANGE ON THE ENVIRONMENT IN IDP AND RETURNEE LOCATIONS

AUGUST 2022



DTM
IOM DISPLACEMENT TRACKING MATRIX

INTRODUCTION

Climate change and environmental degradation are widespread in Iraq, with reduced water availability and land degradation impacting the livelihoods of vulnerable communities across the country. The United Nations Global Environment Outlook 6 (GEO-6) identified Iraq as the world's fifth most vulnerable country to decreasing water and food availability and extreme temperatures.[1]

Displaced families are likely to be among the most vulnerable to climatic and environmental changes that can impact livelihoods, food security and social cohesion. Sustainable return and reintegration can be determined by many factors but the role of climatic change and environmental degradation in return dynamics is insufficiently understood. The impact of climate change on the displaced and returnee populations in Iraq remains an important gap in existing research and monitoring, yet addressing this gap is vital as environmental trends worsen and humanitarian response planning ceases at the end of 2022.

The Integrated Location Assessment 7 (ILA 7), conducted from April to June 2022, included a select group of indicators focused on:

a) the impact of climate change on the environment in all locations of displacement and return;

b) the impact of environmental degradation on locations where agriculture, livestock rearing and fishing were reported among the top three sources of income for the majority of IDPs or returnees in a location. The potential impact of environmental degradation for these livelihoods may include loss of crop production, livestock deaths or reduced fishing yields, as well as the proportion of families that had abandoned agricultural livelihoods in the last 12 months.

This factsheet provides a summary of the data on these indicators with the aim of highlighting trends and geographic areas of concern to guide more comprehensive and granular assessments of the vulnerability factors and mobility drivers among displaced and returned families living in locations affected by climate change and environmental degradation.

METHODOLOGY OVERVIEW

The Integrated Location Assessment (ILA) collects detailed information on displaced and returnee households living in locations identified through the Displacement Tracking Matrix (DTM) Master Lists. The reference unit of the assessment is the location, which is defined as an area that corresponds with either a village for rural areas or a neighbourhood for urban areas (that is, the fourth official administrative division). Information is collected once a year by the International Organization for Migration's (IOM) Rapid Assessment and Response Teams (RARTs) through interviews with key informants and direct observation at the aggregate level, that is, on the majority of IDPs and returnees living in a location, not on individual households.[2]

ILA 7 was conducted from April to June 2022 and covered 3,717 locations, reaching 4,963,230 returnee individuals and 1,139,566 IDP individuals (representing 99% of all recorded returnees and 97% of IDPs).

CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION

The most prevalent environmental event recorded in ILA 7 was **sand or dust storms**, which impacted 97 per cent of IDP locations (1,871) and all returnee locations (2,153) (Figure 1). Such storms are most common from late May through mid-August, when *shamal* winds blow sand, dust and loose soil from the Tigris-Euphrates basin. Consecutive years of drought and desertification of arable land have exacerbated the intensity and frequency of these storms.[3] Displaced families may be disproportionately impacted by sand or dust storms; 9 per cent of IDP families reside in critical shelters,[4] 91 per cent of IDP families live in locations where informal labour is a key source of income for the majority of families and they may be exposed to extreme weather conditions in the course of daily labour and 28 per cent of IDP families live in locations where there is no functional private or public hospital within 10 km in the event that poor air quality aggravates respiratory conditions. Returnee families also face exposure to dust and sandstorm events; 63 per cent of returnee families live in locations where informal labour is a key source of income for the majority of families and 38 per cent of returnee families live in locations where agriculture, farming and herding are a key source of income for the majority of families.

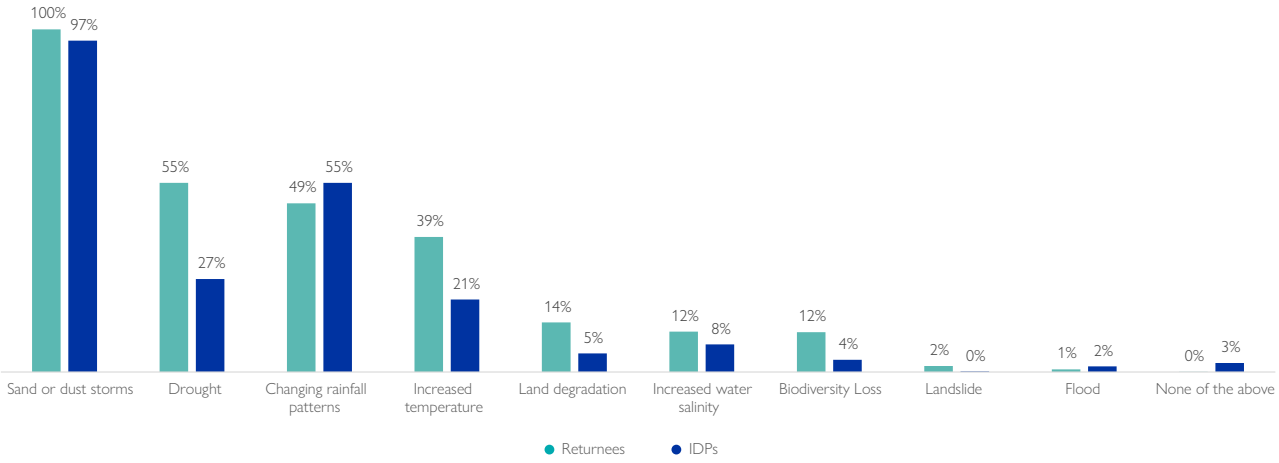
1 United Nations Environment Programme, *UN Global Environment Outlook 6* (2019).

2 Per IOM DTM's ILA Methodology, the number of IDP and returnee individuals is calculated by multiplying the number of out-of-camp households by six (the average size of an Iraqi household) and in-camp households by five (the average size of camp households). In terms of family composition, female-headed households were present in 72 per cent of IDP sites and 84 per cent of returnee sites. A majority of IDP and returnee sites (60% and 84%, respectively) reported that the share of female-headed households is between 0 and 9 per cent.

3 Ali A. Attiya & Brian G. Jones. Climatology of Iraqi dust events during 1980-2015. *SN Appl. Sci.* 2(845) (2020).

4 DTM Iraq, *Master List Round 126 – April to June 2022* (August 2021).

Figure 1: Percentage of IDP and returnee locations reporting climate change and environmental degradation in the 12 months prior to the assessment



Changing rainfall patterns impacted 55 per cent of IDP locations (1,068) and were most prevalent in Sulaymaniyah (100%, 392), Missan (100%, 15), Wassit (99%, 68) and Thi-Qar governorates (98%, 41). Returnee locations were similarly affected, with 49 per cent reporting changing rainfall patterns. Baghdad governorate was the most affected (75%, 91), with all locations in Abu Ghraib (100%, 33) and Kadhimia districts (100%, 10) also indicating such a change. Diyala governorate (64%, 142) and Anbar governorate (63%, 208) were also notably affected. Available remote sensing data suggests that changing rainfall patterns affect a larger area than indicated by ILA 7, with an estimated 98 per cent of households living in areas with a precipitation deficit in the first quarter of 2022.[5]

The impact of changing rainfall patterns is likely to be worst in locations where the majority of families rely on the cultivation of cereals, vegetables and fruits as a major source of income. ILA 7 found that in 62 per cent of returnee locations and 15 per cent of IDP locations, the majority of families are reliant on the cultivation of cereals, vegetables and fruits as a major source of income. Families in these locations are likely to be among the most vulnerable to variations in rainfall, as a shortage of irrigation water leads to a reliance on rainfed agriculture.

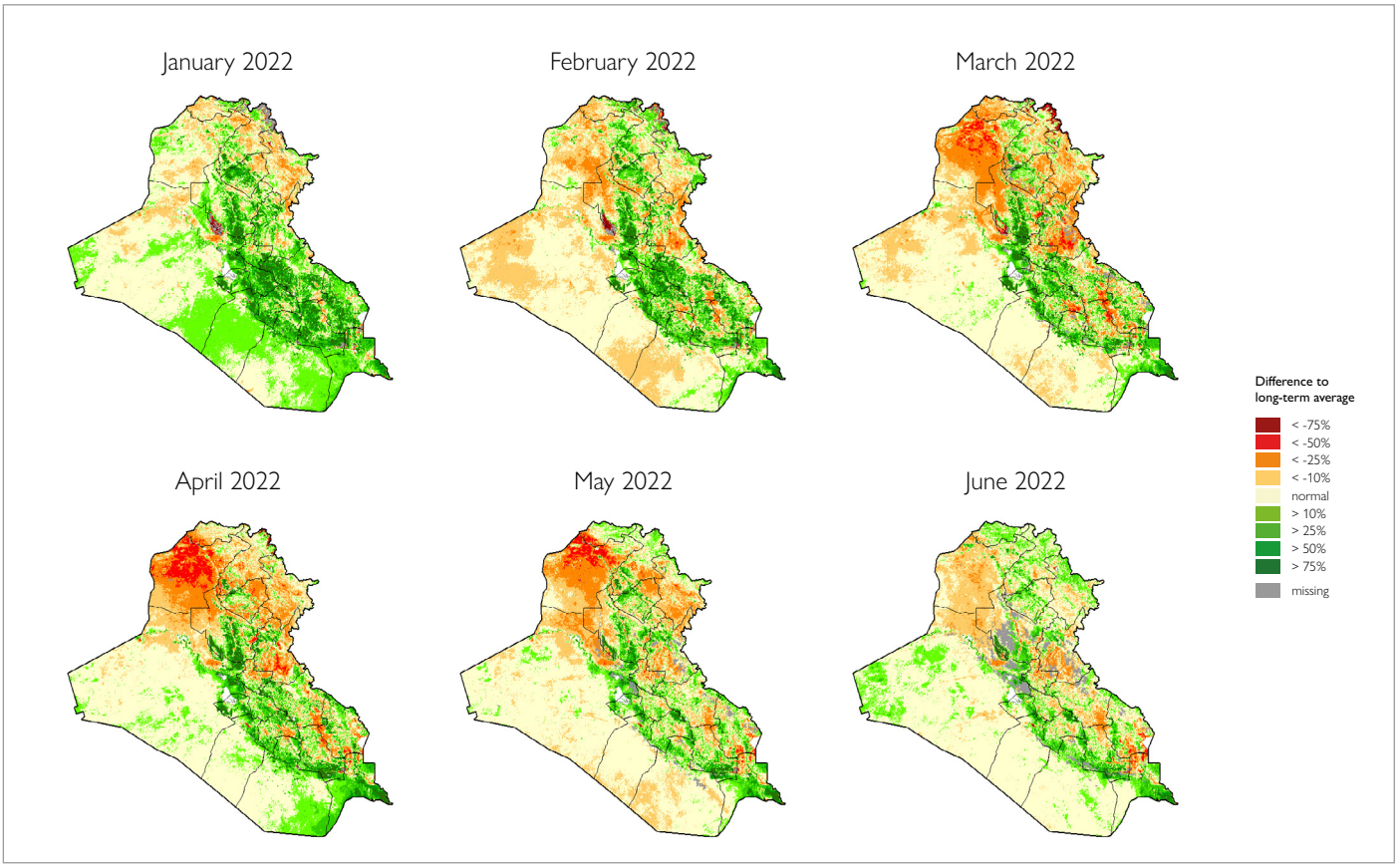
In the 12 months preceding ILA 7, **drought** impacted over a quarter of IDP locations (27%, 525) and more than half of returnee locations (55%, 1,189). Drought was reported in 96 per cent of IDP locations in Babylon governorate (46), followed by 87 per cent of IDP locations in Diyala (135) and over half the IDP locations in Kerbala (68%, 45). Almost all returnee locations in Diyala were affected by drought (96%, 214) as well as 85 per cent of returnee locations in Makhmur district, Erbil governorate (55).

The Food and Agriculture Organization (FAO) Global Information Early Warning System (GIEWS) presents satellite data on indicators such as the normalized difference vegetation index (NDVI) anomaly, which compares the current density of vegetation cover to the long-term average.[6] At the district level, data reflecting the perceptions of IDPs and returnees from ILA 7 are corroborated with NDVI anomaly data (Figure 2). All or nearly all IDP locations in Akre (22), Al-Ba'aj (9), Al-Shikhan (14), Hatra (6) and Tilkaif (25) reported drought conditions. In Anbar governorate, the same is true for all locations in Al-Ka'im (9), Al-Rutba (9), Ana (6) and Haditha (13) districts. Other hotspots, identifiable in both ILA and NDVI datasets are Khanaqin (51), Ba'quba (46) and Al-Khalis (31) districts in Diyala governorate, as well as Al-Musayab (41) in Babylon. For returnee locations, select districts within Ninewa governorate can also be highlighted in both the NDVI anomaly data and ILA 7 perceptions data, with Al-Ba'aj (84%, 94), Hatra (100%, 87) and Tilkaif (98%, 45) among the most affected by drought.

5 REACH-IMPACT, *Iraq Precipitation Deficit over Populated Areas* (January-March 2022).

6 FAO, *Earth Observation – Iraq* (2022).

Figure 2: NDVI Anomaly, January to June 2022



Reduced water levels in Iraq's rivers result in higher **salinity** in the water table and – when used in irrigation – higher salinity in soil, which limits crop production. Overall, water salinity was reported to have increased in the 12 months prior to the assessment in only 8 per cent of IDP locations and 12 per cent of returnee locations. Locations with increased water salinity tended to be concentrated, with all IDP locations in Muthanna governorate (10) and 90 per cent of locations in Basrah (55) indicating such an increase. Increases in water salinity also impacted 32 per cent of locations in Diyala governorate, most notably in Al-Khalis district (97%, 31). Increased water salinity was less concentrated among returnee locations. In Diyala governorate, 39 per cent of all returnee locations reported this phenomenon, with Al-Khalis the most notable district with 68 per cent of returnee locations affected (61). Other districts with a high prevalence of affected returnee locations included Haditha (87%, 27) and Ana (75%, 9) in Anbar governorate and Tarmia in Baghdad governorate (84%, 27).

Land degradation, the reduction or loss of productivity in arable land due to climatic conditions and human activities, was not widely reported among IDP locations (5%) or returnee locations (14%). This may be because degradation typically occurs over a longer timeframe than the 12 months specified in ILA 7. Iraq is known to suffer from land degradation due to anthropogenic factors such as unsustainable agricultural practices as well as environmental changes such as soil salinity and dust or sandstorms.[7] Land degradation was reported to be most prevalent in Diyala, as indicated by 59 per cent of returnee locations (132) and 30 per cent of IDP locations in the governorate (47). In Anbar governorate, land degradation was prevalent in returnee locations in Ana (100%, 12) and Haditha (97%, 30) districts.

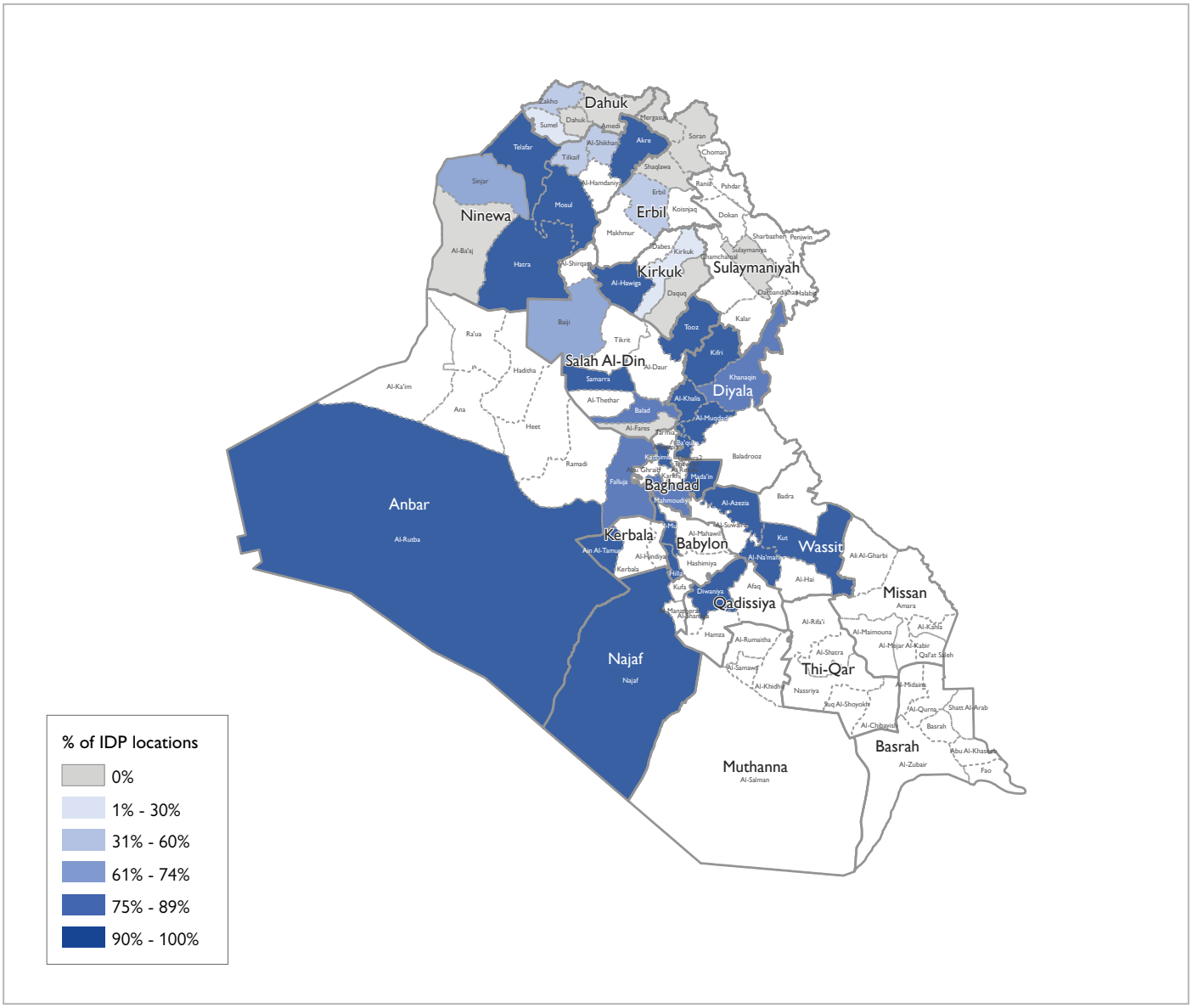
7 Republic of Iraq, Ministry of Agriculture, *Land Degradation Neutrality Target Setting: National Report* (2017).

THE IMPACT OF ENVIRONMENTAL DEGRADATION ON AGRICULTURAL LIVELIHOODS

Agriculture, livestock and fishing are among the top three sources of income for the majority of IDPs in 15 per cent of IDP locations (297). There are 54,869 IDP families in these locations (28% of the displaced population). For returnees, agriculture, livestock and fishing are among the top three sources of income in 64 per cent of locations (1,374), in which 312,784 returnee families reside (38% of the returnee population). Thus, the relationship between environmental degradation and agricultural livelihoods is a pressing question for a large subset of population groups in need identified in Iraq's Humanitarian Response Plan for 2022.[8]

Of the 297 IDP locations that reported agriculture, livestock and fishing among the top three sources of income for the majority of IDPs, over half experienced a **loss of crop production, livestock deaths or reduced fishing yields** due to climate change and environmental degradation (such as drought, floods and water salinity) in the 12 months prior to the assessment (59%, 175). In Ninewa, 74 per cent of locations that are reliant on agriculture as a major source of income experienced a loss in yields (69), most notably in Telafar (100%, 18) and Akre (93%, 13). Other districts of concern include Kadhimia in Baghdad governorate (92%, 11) and Tuz Khurmatu, Salah al-Din (100%, 14). Overall, 21,370 displaced families reside in locations that are reliant on agriculture as a major source of income but have seen it diminished by climatic and environmental changes, placing a strain on food security in some areas.

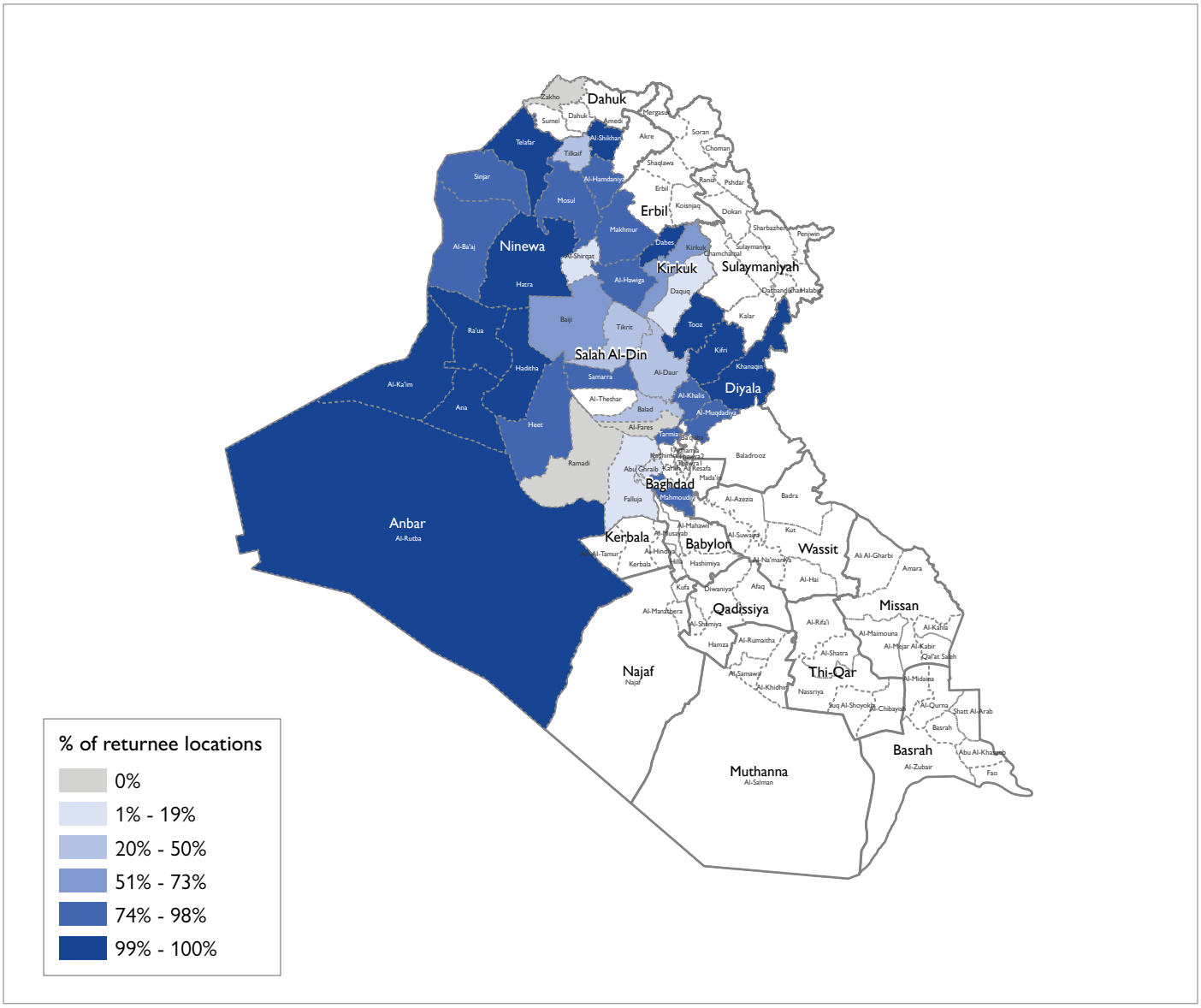
Map 1: Districts by the percentage of IDP locations where agriculture, livestock and fishing provide a main source of income and yields have been reduced by environmental degradation in the last 12 months



8 Office for the Coordination of Humanitarian Affairs, *Humanitarian Response Plan: Iraq* (2022).

Of the 1,374 agricultural returnee locations reliant on agriculture as a major source of income, 82 per cent reported that climate change and environmental degradation had led to a loss of crop production, livestock deaths or reduced fishing yields in the 12 months prior to the assessment (1,125). This includes nearly all agricultural returnee sites in Erbil (98%, 52), Diyala (95%, 138) and Ninewa (92%, 621) governorates. Overall, 215,542 returnee families reside in locations that are reliant on agriculture as a major source of income but have seen productivity and yields drop as a result of climate change and environmental degradation – equivalent to 26 per cent of all returnee families in Iraq.

Map 2: Districts by the percentage of returnee locations where agriculture, livestock and fishing provide a main source of income and yields have been reduced by environmental degradation in the last 12 months

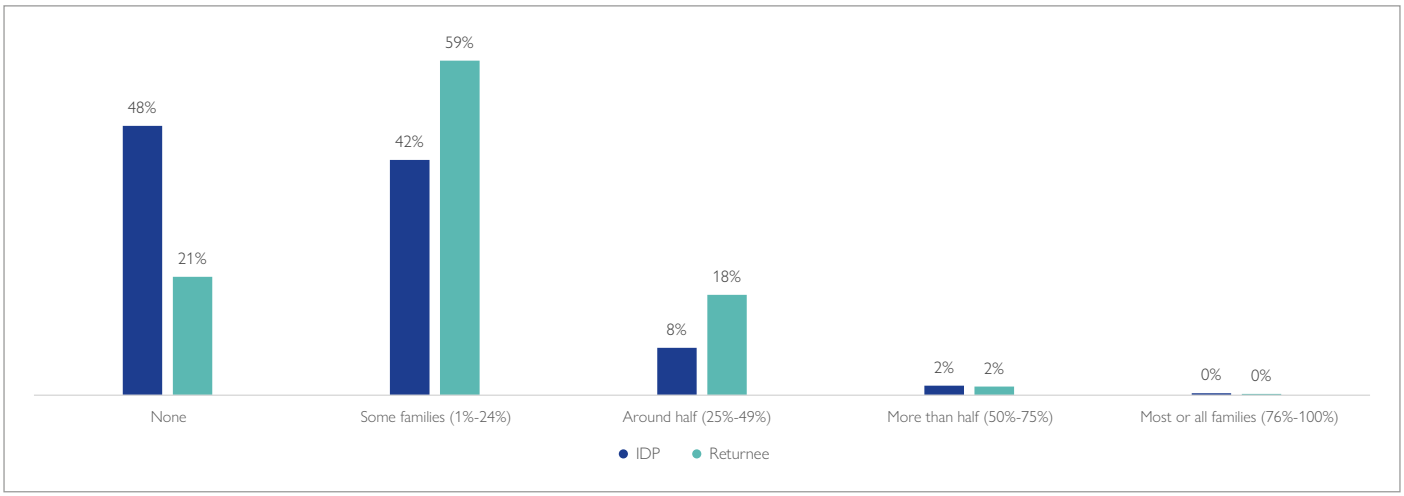


Key informants were also asked what proportion of families had **abandoned agricultural livelihoods** in locations reliant on agriculture as a major source of income in the 12 months prior to the assessment. Agriculture, livestock and fishing livelihoods were abandoned due to environmental degradation in over half of the IDP locations where it is a main source of income (52%, 155). 'Some' families (1–24%) abandoned agricultural livelihoods in 42 per cent of IDP locations that reported agriculture as a main source of income for the majority of IDP families (124). 'Around half' of families abandoned agriculture in 8 per cent of these locations (25). 'More than half' or 'most' families had abandoned agriculture in the last year in three IDP locations in Diyala governorate, as well as one site each in Anbar, Wassit and Kirkuk governorates. Districts with a high proportion of IDP locations where families are abandoning agriculture due to environmental degradation included Kadhimia in Baghdad governorate (100%, 12), as well as Telafar (100%, 18), Sinjar (67%, 10) and Tilkaif (33%, 5) in Ninewa governorate. Three locations in Al-Na'maniya district, Wassit governorate, also saw 'around half' or 'more than half' of IDP families abandon agriculture (100% of IDP locations reliant on agriculture as a major source of income in the district).

In returnee locations, 79 per cent of those locations that are reliant on agriculture as a major source of income recorded at least some families abandoning agricultural livelihoods due to climate change and environmental degradation. 'Some' families (1–24%) abandoned agricultural livelihoods in 59 per cent of returnee locations that reported

agriculture as a main source of income for the majority of returnee families (816). 'Around half' of families abandoned agriculture in 18 per cent of these locations (245). 'More than half' or 'most' families had abandoned agriculture in the last year in 12 returnee locations in Khanaqin district, Diyala governorate, as well as seven locations in Makhmur district, Erbil governorate and three locations in Al-Ba'aj district in Ninewa governorate.

Figure 2: Percentage of IDP and returnee locations reliant on agriculture as a major source of income which abandoned agricultural livelihoods in the 12 months prior to the assessment



The relationship between climate change and environmental degradation and the abandonment of agricultural livelihoods is an important focus of future research on climate-induced displacement. ILA 7 found that locations which reported drought conditions in the 12 months prior to the assessment were far more likely to report a loss of agricultural yield.[9] Drought was also an important contributing factor in locations where families abandoned agricultural livelihoods in the 12 months prior to the assessment. IDP locations in which 'some' or 'around half' of families had abandoned an agricultural livelihood were twice as likely to have experienced drought (97 locations with drought, 52 without drought). Four of the five locations in which 'more than half' of families had abandoned agriculture had also experienced drought in the 12 months prior to the assessment. For returnees, 74 per cent of the locations that recorded families abandoning agricultural livelihoods were also affected by drought.

Other climate factors, which might have been expected to play a larger role in reduced agricultural yield and the abandonment of agricultural livelihoods, were less directly correlated than drought. For example, increased water salinity is known to negatively affect agricultural productivity when used in irrigation. However, only 9 per cent of IDP locations and 17 per cent of returnee locations that reported reduced agricultural yield as a result of environmental degradation also reported increased water salinity in the 12 months prior to the assessment. Similarly, only 10 per cent of IDP locations and 17 per cent of returnee locations that recorded families abandoning agricultural livelihoods noted increased water salinity.

CONCLUSION

Displaced and returnee families are vulnerable to climatic change and environmental degradation which impact livelihoods and food security and thus affect the achievement of a durable solution. More regular, granular and comprehensive assessments are required to better understand and address vulnerability factors and mobility drivers among displaced families living in locations affected by climate change. However, this factsheet highlights that the severity and prevalence of extreme climatic conditions pose a threat to displaced and returnee families through the reduction of income and agricultural yield, which can result in the abandonment of agricultural livelihoods in some areas. Targeted programming and policies that explicitly address climate resilience will be required to ensure that these families are able to achieve a durable solution to displacement. This may include financial assistance to support investment in climate-smart agriculture, livelihoods programming to promote diversification of labour market opportunities and improved service provision and infrastructure in areas most impacted by climate change.[10, 11]

9 Seventy-two per cent of IDP locations that reported a loss of agricultural yield also recorded drought conditions. Similarly, 76 per cent of returnee locations that reported a loss of agricultural yield also recorded drought conditions.

10 IOM. *Migration into a Fragile Setting: Responding to Climate-Induced Informal Urbanization and Inequality in Basra, Iraq* (October 2021).

11 Internal Displacement Monitoring Centre. When canals run dry: Displacement triggered by water stress in the south of Iraq. *No Matter of Choice: Displacement in a Changing Climate* (February 2020).

ANNEXES

Table 1: Climate issues, percentage of IDP locations[12]

			Climate issues reported								
Governorate	District	Locations where climate issues reported	Drought	Flood	Increased water salinity	Landslide	Biodiversity loss	Land degrada-tion	Changing rainfall patterns	Increased temperature	Sand or dust storms
Anbar	Falluja	100%	6%	0%	6%	0%	0%	0%	33%	67%	100%
Babylon	Al-Musayab	100%	98%	0%	2%	0%	0%	0%	0%	100%	100%
Baghdad	Mahmoudiya	100%	5%	0%	5%	0%	0%	0%	81%	10%	100%
Dahuk	Dahuk	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Dahuk	Sumel	40%	27%	0%	0%	0%	0%	0%	0%	0%	13%
Dahuk	Zakho	94%	36%	0%	0%	0%	0%	0%	0%	0%	94%
Diyala	Ba'quba	100%	96%	0%	33%	0%	31%	42%	48%	25%	100%
Diyala	Khanaqin	100%	100%	0%	2%	0%	4%	12%	42%	30%	100%
Erbil	Erbil	100%	8%	15%	0%	0%	0%	0%	67%	0%	100%
Erbil	Makhmur	100%	100%	0%	0%	0%	0%	0%	100%	0%	100%
Kerbala	Kerbala	100%	69%	0%	5%	0%	9%	14%	55%	45%	100%
Kirkuk	Kirkuk	100%	2%	0%	0%	0%	0%	0%	41%	0%	100%
Najaf	Najaf	100%	22%	0%	4%	0%	0%	0%	0%	0%	100%
Ninewa	Akre	100%	96%	0%	0%	0%	0%	0%	0%	0%	100%
Ninewa	Al-Ba'aj	100%	90%	0%	0%	0%	0%	0%	100%	0%	100%

12 This table covers the 26 main districts of displacement, which host 90 per cent of the total caseload of IDPs.

			Climate issues reported								
Governorate	District	Locations where climate issues reported	Drought	Flood	Increased water salinity	Landslide	Biodiversity loss	Land degrada-tion	Changing rainfall patterns	Increased temperature	Sand or dust storms
Ninewa	Al-Hamdaniya	100%	0%	0%	0%	0%	0%	0%	100%	75%	100%
Ninewa	Al-Shikhan	100%	78%	0%	0%	0%	0%	0%	0%	0%	100%
Ninewa	Mosul	100%	24%	0%	0%	0%	0%	0%	1%	13%	100%
Ninewa	Sinjar	100%	14%	0%	0%	0%	0%	0%	36%	0%	100%
Ninewa	Telafar	100%	65%	0%	0%	0%	0%	0%	81%	16%	100%
Ninewa	Tilkaif	100%	100%	0%	16%	0%	0%	40%	48%	20%	100%
Salah al-Din	Samarra	100%	0%	0%	0%	0%	0%	0%	4%	0%	100%
Salah al-Din	Tikrit	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Salah al-Din	Tuz Khurmatu	100%	78%	57%	0%	0%	0%	22%	61%	78%	100%
Sulaymaniyah	Chamchamal	100%	8%	0%	0%	0%	0%	0%	100%	0%	100%
Sulaymaniyah	Kalar	100%	2%	0%	0%	0%	0%	0%	100%	0%	100%
Sulaymaniyah	Sulaymaniya	100%	2%	0%	0%	0%	0%	0%	100%	0%	100%
TOTAL		**97%**	**28%**	**2%**	**8%**	**0%**	**4%**	**6%**	**55%**	**22%**	**97%**

Table 2 : Climate issues, percentage of returnee locations[13]

			Climate issues reported								
Governorate	District	Locations where climate issues reported	Drought	Flood	Increased water salinity	Landslide	Biodiversity loss	Land degrada-tion	Changing rainfall patterns	Increased temperature	Sand or dust storms
Anbar	Al-Ka'im	100%	100%	0%	0%	0%	41%	41%	100%	100%	100%
Anbar	Al-Rutba	100%	100%	0%	0%	0%	100%	22%	100%	100%	100%
Anbar	Ana	100%	100%	0%	75%	0%	75%	100%	100%	83%	100%
Anbar	Falluja	100%	31%	0%	0%	0%	0%	4%	45%	5%	100%
Anbar	Haditha	100%	100%	0%	87%	3%	87%	97%	100%	100%	100%
Anbar	Heet	100%	72%	0%	16%	0%	26%	29%	100%	100%	100%
Anbar	Ramadi	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Anbar	Ra'ua	100%	100%	0%	0%	0%	10%	10%	100%	100%	100%
Baghdad	Abu Ghraib	100%	6%	0%	21%	0%	0%	0%	100%	15%	100%
Baghdad	Kadhimia	100%	0%	0%	0%	0%	0%	0%	100%	0%	100%
Baghdad	Mahmoudiya	100%	38%	0%	6%	0%	0%	49%	51%	19%	100%
Baghdad	Tarmia	100%	0%	0%	84%	0%	0%	0%	75%	16%	100%
Dahuk	Zakho	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Diyala	Al-Khalis	100%	94%	1%	68%	39%	73%	86%	80%	92%	100%
Diyala	Al-Muqdadiya	100%	95%	0%	38%	2%	50%	48%	43%	36%	100%
Diyala	Khanaqin	100%	100%	0%	5%	0%	5%	36%	60%	62%	100%
Diyala	Kifri	100%	100%	0%	0%	0%	0%	100%	100%	100%	100%
Erbil	Makhmur	100%	85%	2%	0%	0%	0%	0%	14%	8%	100%
Kirkuk	Al-Hawiga	100%	70%	1%	47%	0%	46%	9%	67%	67%	100%
Kirkuk	Dabes	100%	0%	0%	0%	0%	0%	0%	100%	0%	100%

13 This table presents the main districts of return.

			Climate issues reported								
Governorate	District	Locations where climate issues reported	Drought	Flood	Increased water salinity	Landslide	Biodiversity loss	Land degrada-tion	Changing rainfall patterns	Increased temperature	Sand or dust storms
Kirkuk	Daquq	100%	5%	0%	0%	0%	0%	0%	29%	33%	100%
Kirkuk	Kirkuk	100%	22%	0%	0%	0%	0%	0%	39%	10%	100%
Ninewa	Al-Ba'aj	100%	84%	0%	0%	0%	0%	0%	76%	0%	100%
Ninewa	Al-Hamdaniya	100%	0%	0%	0%	0%	0%	5%	95%	19%	100%
Ninewa	Al-Shikhan	100%	100%	0%	0%	0%	0%	0%	0%	0%	100%
Ninewa	Hatra	100%	100%	0%	0%	0%	0%	0%	0%	56%	100%
Ninewa	Mosul	100%	60%	0%	0%	0%	0%	2%	9%	44%	100%
Ninewa	Sinjar	100%	40%	0%	0%	0%	0%	1%	46%	0%	100%
Ninewa	Telafar	100%	33%	0%	0%	0%	0%	0%	71%	49%	100%
Ninewa	Tilkaif	100%	98%	0%	2%	0%	0%	35%	48%	37%	100%
Salah al-Din	Al-Daur	100%	0%	0%	0%	0%	0%	0%	9%	0%	100%
Salah al-Din	Al-Fares	100%	0%	0%	0%	0%	0%	60%	100%	80%	100%
Salah al-Din	Al-Shirqat	100%	0%	0%	0%	0%	0%	2%	90%	0%	100%
Salah al-Din	Baiji	100%	17%	0%	13%	0%	2%	21%	58%	60%	100%
Salah al-Din	Balad	100%	0%	0%	0%	0%	0%	67%	92%	42%	100%
Salah al-Din	Samarra	100%	70%	0%	60%	0%	0%	0%	0%	0%	100%
Salah al-Din	Tikrit	100%	4%	0%	0%	0%	0%	0%	0%	0%	100%
Salah al-Din	Tuz Khurmatu	100%	91%	40%	0%	0%	0%	26%	60%	83%	100%
TOTAL		**100%**	**55%**	**1%**	**12%**	**2%**	**12%**	**14%**	**49%**	**39%**	**100%**

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