



GLOBAL DATA INSTITUTE  
DISPLACEMENT  
TRACKING MATRIX

# SOLUTION AND MOBILITY INDEX— GHANA

OCTOBER 2023

ROUND 1



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## INTRODUCTION

The coastal countries of West Africa are experiencing the impact of climate change and spill-over of the Central Sahel crisis. These vulnerabilities contribute to increased risks of conflict, crisis and a humanitarian situation that is worsening fast and significantly. In this context, there is an urgent need to strengthen the capacities of governments and other relevant actors to conduct evidence-based Disaster Risk Reduction (DRR) interventions to reduce disaster and climate related risks, while forced displacement is also a pressing risks. The coastal countries of West Africa – especially Côte d'Ivoire, Ghana, Togo and Benin – lack disaggregated data to make informed decisions on how to prioritize the responses in certain sectors and localities, as well as reliable information to identify the root causes of instability that are driving the deterioration of living conditions.

To help find durable solutions for populations in areas that could be more likely affected by a disaster and to prevent displacements in the region, it is critical to understand their relative levels of stability. In order to understand which factors influence a location's stability to identify priority interventions for transition and recovery, with the goal of strengthening the resilience and stability in this conflictual and displacement-affected region, IOM developed the Solution and Mobility Index (SMI) tool. This tool measures perceptions of stability and analyzes which factors have a relatively larger impact on the decisions of populations to remain in place or to move. The tool is implemented in the Upper East and Upper West regions in Ghana to enable governmental authorities and partners to develop informed strategies.

This report presents the results of the SMI Round 1 data collection conducted in Upper East and Upper West regions in Ghana between the 18<sup>th</sup> and 28<sup>th</sup> October 2023.

## 1. METHODOLOGY

The Solution and Mobility Index (SMI) combines 63 key indicators of stability to estimate a single stability score for each studied locality. These indicators cover four essential themes for stability:

- Safety and security;
- Livelihoods and basic services;
- Social cohesion;
- Disaster frequency and level of adaptation (resilience to disasters).

The indicators for each of these themes are grouped to create sub-scores to facilitate the comparison of localities by theme (see the appendix for more information on the indicators included in this analysis).

Taken together, these indicators highlight areas conducive for sustainable solutions to internal displacement. Three "anchor questions" on the perception of stability in the community (sense of stability, community's future intentions, and trends in the situation) are used to validate the relation between the stability score and the community's perception.

To estimate the stability score of a locality, the SMI uses the logistic regression analysis that compares the 63 key stability indicators with the responses to the three perception questions. By using the logistic regression, the relation between these variables is estimated, and the probability (ranging from 0 to 100) of stability in localities is generated. This helps to better understand the areas that require sustainable solutions to improve stability and security in internal displacement.

Not all localities have been assessed in Upper East and Upper West regions. Some localities in Upper East, for instance, were not assessed due to insecurity. Therefore, the information should not be generalized for the entire region.

### 1.1 Data collection overview

The Solution and Mobility Index (SMI) Round 1 uses data collected through 395 key informant interviews (91% men and 9% women) at the locality level across **242 locations** in two districts (139 in the region of Upper East and 103 in the region of Upper West) in Ghana. Locations for data collection were selected through a mapping exercise to identify areas that could more likely be affected by disasters and displacement according to the National Disaster Management Organisation (NADMO) (see the appendix for further information).

Multiple key informants were interviewed in each locality, allowing IOM to cross-validate information. Key informants included community leaders, and other community representatives. This method has the advantage of rapidly collecting information from many localities. However, it is an estimated representation of the views of an entire community, hence the results of the SMI provide community level information. Moreover, the results of the SMI represent a snapshot of the conditions at a specific period and may vary between rounds or change suddenly.

Figure 1. Number of localities surveyed

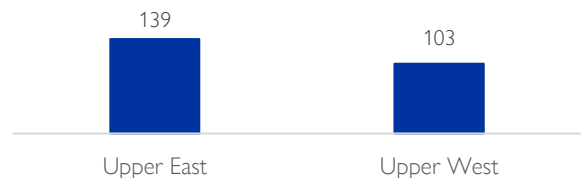


Table 1. Number of locations assessed by district

UPPER EAST	7 districts	139 locations
UPPER WEST	6 districts	103 locations

## 2. KEY FINDINGS

The Solution and Mobility Index (SMI) aims to inform programmatic interventions that can improve stability at the locality level and facilitate durable reintegration of displaced populations in their communities of origin, while also preventing future forced displacements. In the context of Ghana, it has been deployed to understand the parameters that mostly influence the stability of the locations assessed in order to prevent future forced displacement. To enhance stability, the Government of Ghana and its partners could collaborate closely to address specific areas and create specialized programmatic interventions based on the findings of the various SMI indicators, especially with regards to the most significant variables.

### Localities assessed in the two regions are generally safe



The level of security is quite similar in the localities assessed in the two regions and are generally safe. The Upper West region seems to have more localities assessed with better security conditions and also registered the localities with the highest security score (76 on average). For the Upper East region, while the level of security is good overall, there are two localities with the lowest score: Natungnia (47) in the district of Kassena Namkana Municipal, and Natinga (45) in the district of Bawku West. The Upper West is the region which has the most refugees upon the assessed areas.

### Strong association between access to services and social cohesion and feeling of stability



Higher levels of social cohesion and access to services are generally associated with feelings of stability. Localities where key informants have declared that populations feel safe have on average higher scores on access to services and social cohesion.

### Most of the residents in the localities feel their locality is stable and populations do not wish to leave



The majority (90%) of key informants in the locations assessed have declared that residents in their localities are feeling safe and their locality is stable. Less than two per cent of the populations in the localities assessed wish to leave these locations.

### The stability score is quite high overall



Overall, the stability index scores are generally high in the two regions. Upper East had the highest average score (93). All districts in this region have, at least, an average score greater than 83. Upper West also registered on average a good score; of 81. The districts which registered the lowest scores were: Nandom (65) and Lambussie (60), in Upper West regions.

### The districts of Sissala West and Nabdam have the highest stability index scores



The district of Sissala West in Upper West stands out with the highest average score (94) among all the districts assessed in that region. For Upper East, the district of Nabdam has the highest stability score, with an average score of 100.

### Low resilience to catastrophes



Resilience to catastrophes and climate change is a challenge in both regions. Resilience scores are very low with Upper East having a score of 34 out of 100 and Upper West of 31 out of 100. Bawku West in the Upper East had the highest score in terms of resilience to disasters, of 50 out of 100.



### 3. OVERVIEW UPPER EAST AND UPPER WEST SMI SCORES

#### 3.1 Sub-index Scores by Region

Security emerges as a strength in the two regions assessed. Collectively, the regions have an average score of 73. The Upper West region leads with an average security score of 76. The district of Sissala West in Upper West stands out as the district with the highest security score, with a value of 81. In Upper East region, it is the district of Talensi which stands out with the highest score out of the assessed districts, with a score of 77.

In terms of access to services, both regions generally demonstrate acceptable scores, with an average of 67 (69 for Upper West region and 65 for Upper East region). These scores, however, also indicate challenges in access to service that can be improved.

Social cohesion is a shared strength in the regions assessed. Upper East region reports an average social cohesion score of 80, while Upper West region reports 81. This indicates a high degree of unity and social harmony within the localities in the regions, even where displaced individuals are residing. The consistency of the average and median scores suggests that the level of social cohesion is homogeneous across all surveyed localities.

Resilience to disasters is the weakest pillar in terms of score. With an overall average score of 33 (34 for Upper East region and 31 for Upper West region). Therefore, despite the lowest score for that pillar, the majority of key information indicating that in the localities declared are stable and people do not wish to leave, this pillar registered low resilience to disaster score. This pillar should be taken into consideration for programmatic response.

Overall, social cohesion is a significant strength with high average and median scores. Security scores are also favourable. Access to services scores indicate generally acceptable provision of services across these regions, nevertheless this needs some reinforcement. Resilience to disasters scores show that significant challenges exist in this sector which would need to be addressed for a better preparation to disasters.

The table 3 shows that in **unstable conditions**, a minority of residents choose to 'leave,' with two locations being 'optimistic' (less than 1%). Meanwhile, the residents of 14 locations would decide to 'stay' under 'not optimistic' circumstances (6%), and in 9 locations to maintain an 'optimistic' outlook while choosing to 'stay' (4%). In more **stable conditions**, the majority of locations show resilience, with the inhabitants of 36 choosing to 'stay' despite 'not optimistic' feelings (15%), and in 180 locations opting to 'stay' while maintaining an 'optimistic' perspective (76%).

Table 3. The locations per combinations of responses to the three anchor questions

Stability	Community perception	Feeling of the situation	Number of locations	Percentage of locations
Unstable	Leave	Not optimistic	0	0%
Unstable	Leave	Optimistic	2	1%
Unstable	Stay	Not optimistic	14	6%
Unstable	Stay	Optimistic	9	4%
Stable	Leave	Not optimistic	1	<1%
Stable	Leave	Optimistic	0	0%
Stable	Stay	Not optimistic	36	15%
Stable	Stay	Optimistic	180	74%

Table 2. Average and median sub-scale scores

	Upper East	Upper West	All
<b>Security</b>			
Average	71	76	73
Median	72	74	74
<b>Services</b>			
Average	65	69	67
Median	68	69	68
<b>Social cohesion</b>			
Average	80	81	80
Median	80	82	80
<b>Resilience to disasters</b>			
Average	34	31	33
Median	34	30	32
<b>Solution and Mobility Index</b>			
Average	93	81	88
Median	95	86	95

**Interpreting the Solution and Mobility Index (SMI):** The SMI is a comparative measure, and scores can therefore only be interpreted in relation to other SMI scores. It is therefore critical to look at the distribution of the SMI scores in an assessment to understand the relative position of a single score. For instance, in the calculations below for the Upper East and the Upper West, the median stability score is 95. The cut-off for the first quartile (25% of localities with the lowest score) is 79. Based on this distribution, localities with scores above 95 are classified as having a high stability or being more stable than the rest of the localities assessed.

### 3.2 Solution and Mobility Index Scores by region

In the surveyed regions in Ghana, the Upper West is notably distinct, with 39 per cent of its assessed localities classified as having low stability, which is the highest proportion among the two regions assessed. In Upper West, 29 per cent of localities are classified as medium and 32 per cent as high. This contrasts sharply with Upper East region, where 67 per cent of localities are deemed to have high stability, and only 14 per cent are considered to have low stability. In fact, when looking at the top indicators influencing the stability, Upper East encompass a greater proportion of indicators such as existence of conflicts or crisis management systems, access to legal remedies or presence of public sector employees compared to Upper West.

### 3.3 Sub-Index Scores

According to key informants, in localities where residents feel stable, the scores for security, services, and social cohesion are 73, 67, and 81 out of 100, respectively. The resilience to disasters in these areas is rated 33 out of 100. This suggests a generally positive perception of the local environment in stable localities, marked by strong social ties and adequate services provision.

In contrast, residents in areas perceived as unstable have rated their security similarly at 72 out of 100, but services and social cohesion are lower, scoring 59 and 76, respectively. Their resilience to disasters is evaluated at 29, indicating a more critical view of their locality's stability and services availability.

Regarding intentions to relocate, those planning to stay in their locality have rated security at 74, services at 58, and social cohesion notably high, at 87, with a disaster resilience rating of 33 out of 100. Conversely, those considering leaving their localities have assigned ratings of 73 to security, 67 to services, and 80 to social cohesion, with a resilience to disasters score of 25. The slightly lower rating for social cohesion among those considering leaving (80) compared to those who wish to stay (87) could suggest that, although it is still relatively high, it may contribute alongside other factors to their consideration to move. This highlights that social cohesion seems to be the main factor that could influence population to stay or leave their localities. In fact, communities with high social cohesion are more resilient to many factors including disasters.

Finally, when assessing perceptions of change over the past six months, optimistic individuals have given security, services, and social cohesion ratings of 73, 67, and 81, respectively, with a 34 rating for resilience to disasters. Those less optimistic have rated security slightly higher at 75, but services and social cohesion lower at 65 and 78, respectively, and their resilience to disasters at 31. These variations highlight different views on the evolution of stability and conditions in their localities over time. Generally, it appear that social cohesion and access to services are elements which impact more the stability of the localities.

Figure 2. Region-wide distribution of SMI scores (calculated by quartile)

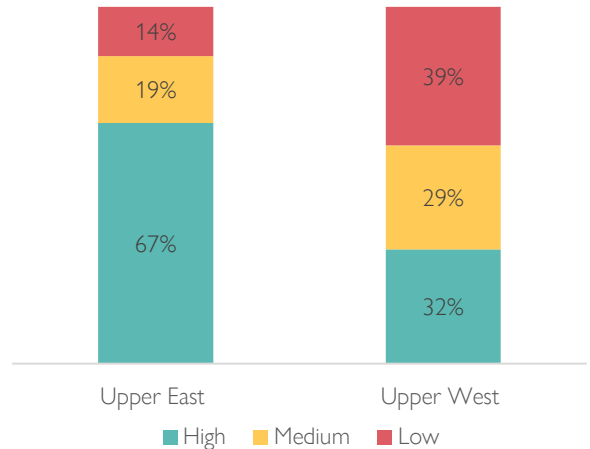


Table 4. Average scores of sub-indices based on perception questions

	Security	Services	Cohesion	Resilience to disasters
<b>Feeling of stability</b>				
Stable	73	67	81	33
Unstable	72	59	76	29
<b>Intention to leave</b>				
Stay	74	58	87	33
Leave	73	67	80	25
<b>Evolution of the situation over the past 6 months</b>				
Optimistic	73	67	81	34
Not Optimistic	75	65	78	31

Ghana is one of the most stable countries in West and Central Africa. The country shares its borders with three countries in West Africa : Côte d'Ivoire to the west, Burkina Faso to the north and Togo to the east. A lot of displacement in Ghana occurs at the border with Burkina Faso. Displacement in Ghana is not only due to cross-border movements but is also characterized by internal displacement. Factors inducing internal displacement of populations in Ghana are:

- Internal tensions, mainly disputes over land, often linked to traditional systems, and
- Disasters mainly caused by windstorm, drought and animal invasion.

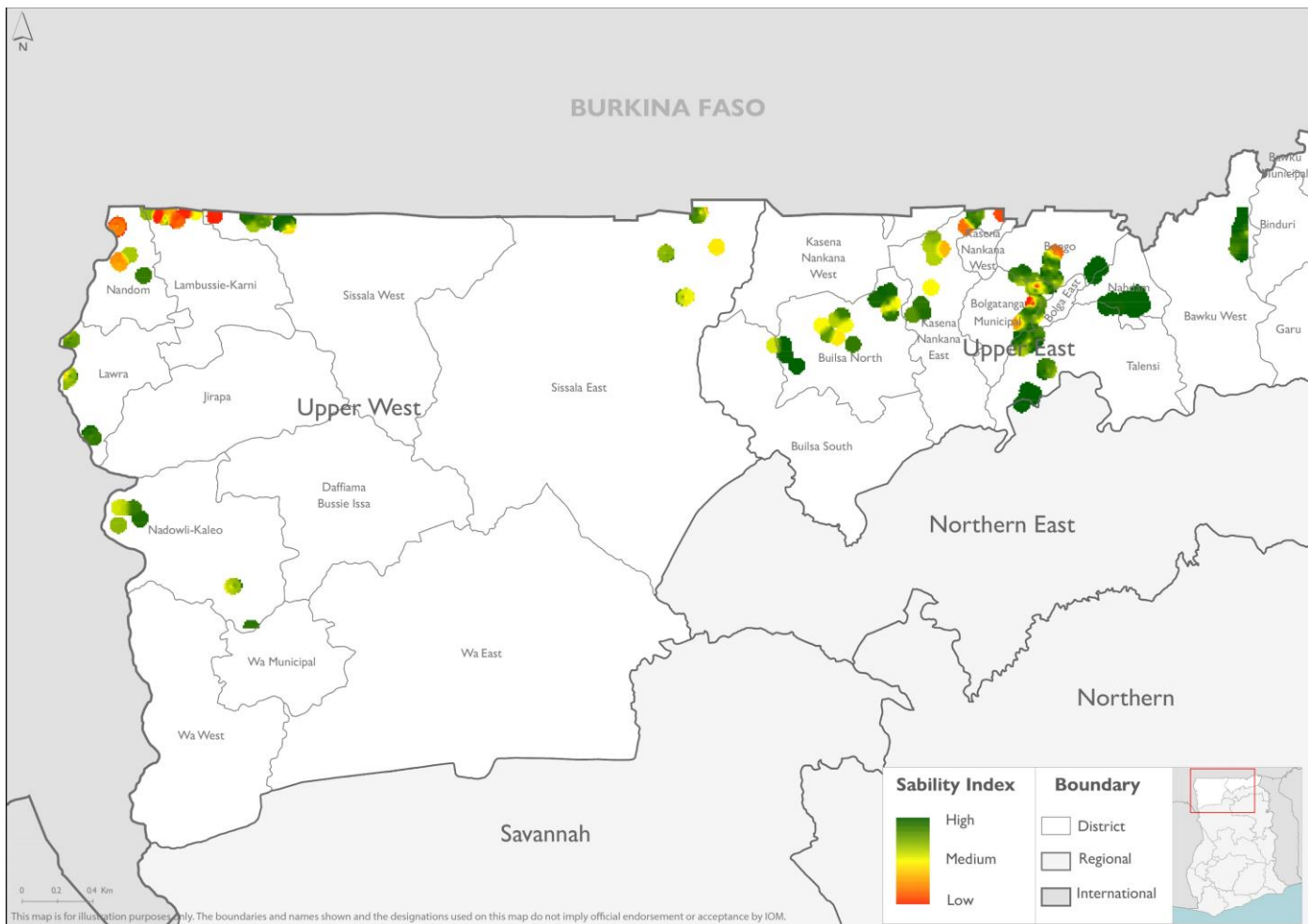
Cross-border displacements are mainly due to the conflict in Burkina Faso. Ghana hosts refugees and asylum seekers at its north border, with the entry points located from the Upper East to the Upper West regions.

Ghana faces various disasters which significantly impact its population. Upper East and Upper West constitute two regions that are highly affected by disasters and often witness displacements due to these events.

The deployment of the solution and mobility index in Ghana helped to identify pockets of stability and instability and allowed at the same time to provide recommended targeted interventions to create or maintain conditions for stability in these areas.

The map below presents the pockets of stability within the assessed localities where the stability index results are categorized as high, medium, and low. In areas where the stability score has been rated as medium or low, actions would need to be implemented to preserve or to create conditions for enhanced stability.

Map 1. Solution and mobility score of localities assessed



## 4. ANALYSIS OF KEY INDICATORS INFLUENCING STABILITY AMONG LOCALITIES

The Solution and Mobility Index (SMI) uses the logistic regression to understand the impact of each indicator on the three perception questions. Indicators with the highest weight have the most influence on determining the stability score. Exploring these key indicators helps to identify important factors that vary the most among the different localities in the region and can, thus, impact the stability.

In this section, the top eight indicators with significant programmatic implications and which be leveraged by the humanitarian community are presented. Additionally, there is a more in-depth analysis of five key stability variables and perception. This analysis provides insights into potential programs and policies to implement in the targeted communities.

### 4.1 Top indicators

Overall, social cohesion indicators as well as safety and security appear to have the greatest influence on the stability of localities in the Upper East and Upper West regions. In fact, among the eight most influential indicators, six of them are related to those indicators.

Additionally, indicators from livelihoods and services, as well as resilience to disasters are among the top eight most influential indicators.

Programs targeting these eight indicators are likely to have a strong impact on community member’s perception of stability.

Figure 3. Top 8 key indicators of the solution and mobility index



Figure 4. Top 5 indicators per scale





## 4.2 Key Indicators with Programmatic Implications

### 1. Conflicts or crisis management mechanisms

Localities assessed in Upper West has the highest presence of refugees and asylum seekers upon the assessed areas. According to key informants, Upper West is also the region where most localities do not have a conflict or crisis management mechanism, with a concern rate of 86 per cent. This could be explained by the fact that the situation in these localities would not require such mechanisms because relations between communities are deemed positive while Upper East has experienced communal tensions in the past. Therefore, in order to prevent conflict between populations and reinforce the social cohesion, it could be necessary to put in place mechanisms that could prevent conflict/crisis such as early warning systems.

### 2. Solidarity in case of disaster

The majority of locations in the two regions have been affected at least once in the past five years by natural hazards, with 93 per cent in the Upper East and 90 per cent in the Upper West. Key informants highlight strong solidarity among village members when facing disasters. In the Upper West region, a notable 74 per cent of the localities report a high level of mutual assistance in such situations. However, in the Upper East, only 48 per cent of localities report that at least the majority of the population helps during natural hazards. However, the resilience capacity of these populations must be strengthened, for example through simulation exercises on the main natural hazards that affects these locations. Key informants, at 64 per cent, have indicated that no simulation exercises have taken place within their localities.

### 3. Presence of public sector employees

The presence of public sector employees is also a key factor in stability regarding the mobility of people in the assessed locations. In the two regions, the public sector employees, for instance public servants, teachers, nurses or policemen, are present and actively working, particularly in the Upper East region. The presence of public sector employees plays a crucial role for the stability of locations in the districts assessed. The absence of public employees could influence negatively the SMI.

### 4. Access to legal remedies

According to the key informants, the vast majority (99%) of communities living in the assessed area have access to legal remedies in their localities or neighbourhoods. The majority of communities in the assessed districts (52%) has access only to informal legal remedies. This was mainly the case in Upper West region where only two of six districts assessed had access to informal legal remedies. For the Upper East region, there is one district where communities in the localities assessed have only access to informal legal remedies. This highlights the need to strengthen formal remedies in the regions.

Figure 5. Existence of conflict/crisis management system

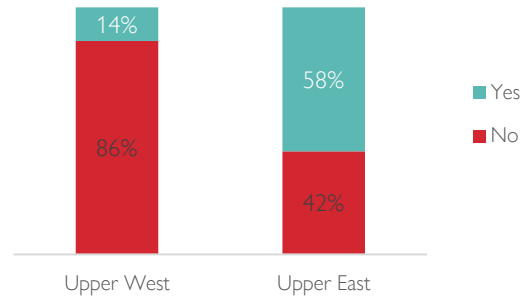


Figure 6. Solidarity in case of disaster

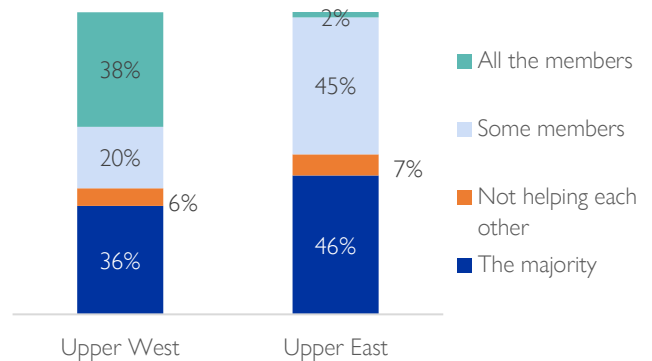


Figure 7. Presence of public sector employees

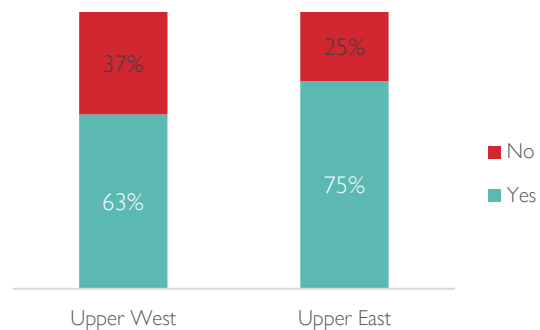
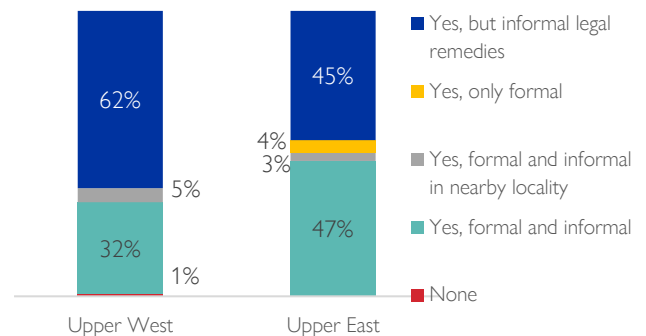


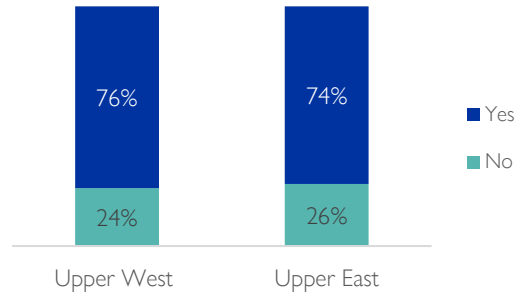
Figure 8. Access to legal remedies



### 5. Cattle theft reported

Cattle theft was reported as very present overall in the localities assessed. Approximately, the same proportion has been observed in Upper East (74%) and Upper West regions (76%). In Upper East, it is mainly common in the districts of Bawku West (92%), Bolga Municipal (84%), Nabdam (89%) and Talensi (74%). For Upper West, cattle theft seems to be common in Lambussie (100%), Nadowli Kaleo (100%), Lawra (93%) and Nandom (80%). Awareness raising campaigns could reinforce the security and prevent impacts related to cattle theft for the communities.

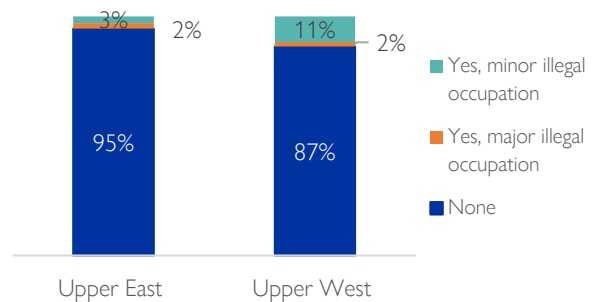
Figure 9. Cattle theft reported



### 6. Illegal occupation of land

According to key informant interviews, illegal occupation of land is not a major issue in the districts of Upper East region and Upper West region. However, this plays a key role in the perception of stability in some localities. In Lambussie (Upper West), half of the key informants have declared some lands as illegally occupied (50% of the key informants declared that they have major or minor illegal occupation of lands). Awareness raising for people in these localities on how to access legal land would help maintain stability.

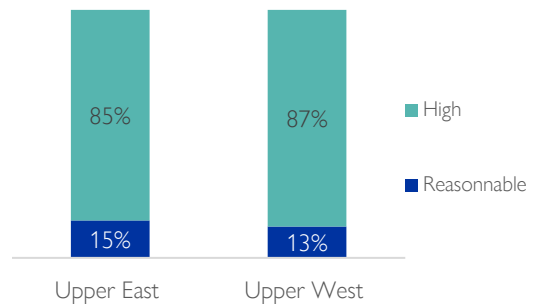
Figure 10. Illegal occupation of land



### 7. Level of use of natural resources such as arable land

According to the key informants, there is a high use of natural resources, such as arable land, in the localities assessed. In Upper East region, Nabdam and Talensi have the highest percentage (96%) of locations with a high usage of arable lands. For Upper West region, the districts of Nandom and Sissala East (100%) have the highest localities with a high usage of lands.

Figure 11. Level of use of natural resources



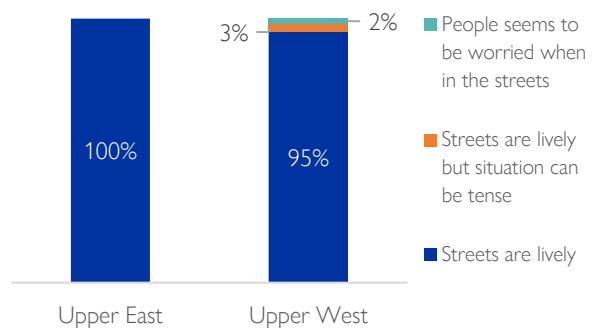
This highlights that promoting a responsible use of natural resources as well as putting in place environmental management systems could play a key role in maintaining the resources.

### 8. Daily public life

Daily public life also constitutes an indicator of the Solution and Mobility Index. In the localities assessed, it does not constitute a challenge as per the key informants interviewed.

Figure 12. Daily public life

In Upper East region, no key informants reported a negative feeling about the liveliness of streets. For Upper West region, a few key informants reported that people could worry about being in the streets. The few who reported some issues regarding daily public life are in the districts of Nadowli Kaleo, Sissala East and Sissala West.



This highlights that investing in infrastructures development, prevent crime and reinforcing the availability and accessibility of public services would contribute to maintain the stability in the regions.

### 4.3 Analysis of Anchor Questions

The first section of the questionnaire focused on the resident's perception of stability in the assessed localities. These “anchor questions” are not used in the Solution and Mobility Index (SMI) calculations but instead to validate the findings against self-reported perceptions in the community. Key informants were asked three main questions to assess the sentiments in their communities.

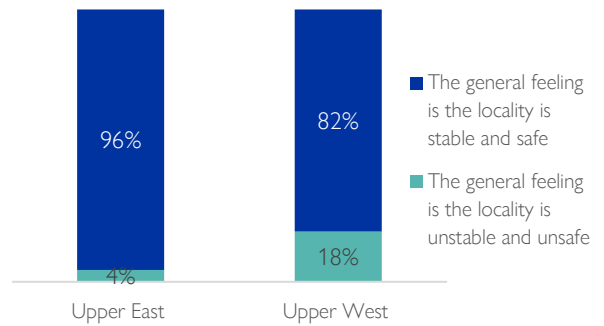
#### Feeling of stability

*Does the residents in the localities feel safe or unsafe?*

In the Upper East region, the majority of localities assessed (96%) are considered stable and safe according to key informants. In the Upper West region, although a high proportion of localities are deemed stable and safe, there is a significant portion (18%) that is perceived as unstable and unsafe. These areas are primarily located in Lambussie and Nandom. Specifically, in Nandom, 57 per cent of the assessed localities are considered unstable by the residents according to key informants.

The high proportion of key informants in localities assessed in Upper East who perceived their localities more stable compared to Upper West could be explained by a high presence of refugee and asylum seekers in these localities in Upper West, compared to Upper East.

Figure 13. Feeling of stability by region

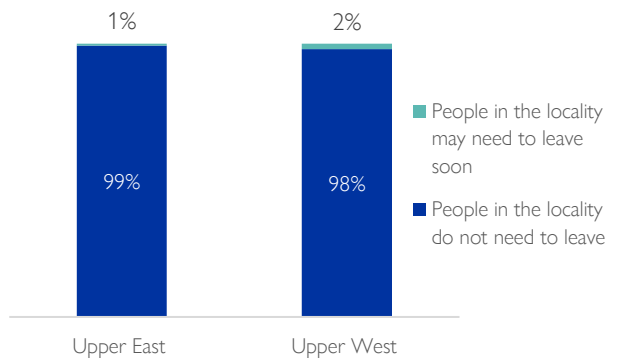


#### Future intentions

*Do people in the locality feel that they need to leave in the following six months?*

Overall, in the two regions assessed, populations do not feel the need to leave soon. In the Upper East region, key informants, at 99 per cent, stated that the populations do not have the intention to leave in the 6 months following the interview. Similarly, in the Upper West region, the percentage stands at 98 per cent, indicating a strong preference among the majority of residents to stay put for the time being. In fact, populations living in the assessed areas are mainly farmers and have their lands in the localities. According to key informants, these lands are fertile and could explain why they do not need to leave the localities.

Figure 14. Future intentions of the population

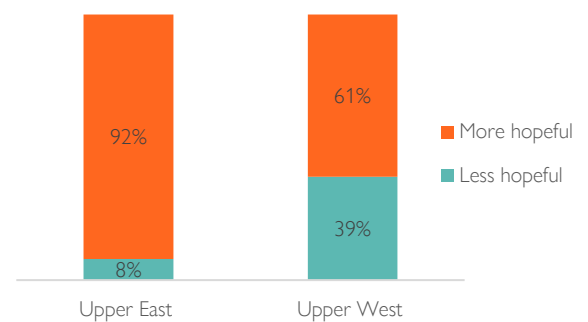


#### Feeling of the situation

*How has your feeling of the situation in your locality changed over the last 6 months*

The majority of key informants in Upper East region (92%) reported that the situation in their locality has changed over the last 6 months. For Upper West, even though the same trend has been observed, the feeling is nonetheless more divided; with 61 per cent more hopeful and 39 per cent less hopeful compared to the situation 6 months earlier.

Figure 15. Feeling of the situation



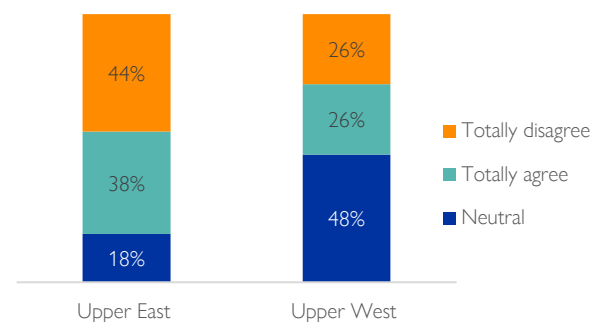
#### Perception of resilience to disasters

*To what extent does the population feel that the locality has the necessary resources, structures and plans to deal effectively with disasters?*

Overall, resilience to disasters seems to be a challenge in the two regions. In fact, nearly one-third (26%) of the key informants in Upper West region and nearly half of them (44%) in Upper East region totally disagree that their localities have the necessary resources, structures and plans to deal effectively with disasters.

For the districts assemblies of Nadowli Kaleo and Lawra, a high proportion of key informants preferred to be neutral on that question (86% in each districts).

Figure 16. Resilience to disasters



## 5. CLUSTER ANALYSIS

### 5.1 Cluster Generation

Grouping similar localities into clusters can help to uncover the distinctive profiles of geographic regions in order to facilitate targeted programming. This analysis uses machine learning to group similar localities into clusters to draw out underlying patterns on the conditions in those areas (see *appendix for details on cluster generation*). High stability clusters can help to pinpoint “pockets of stability” at a level slightly less granular than the individual locality to facilitate feasible programmatic interventions.

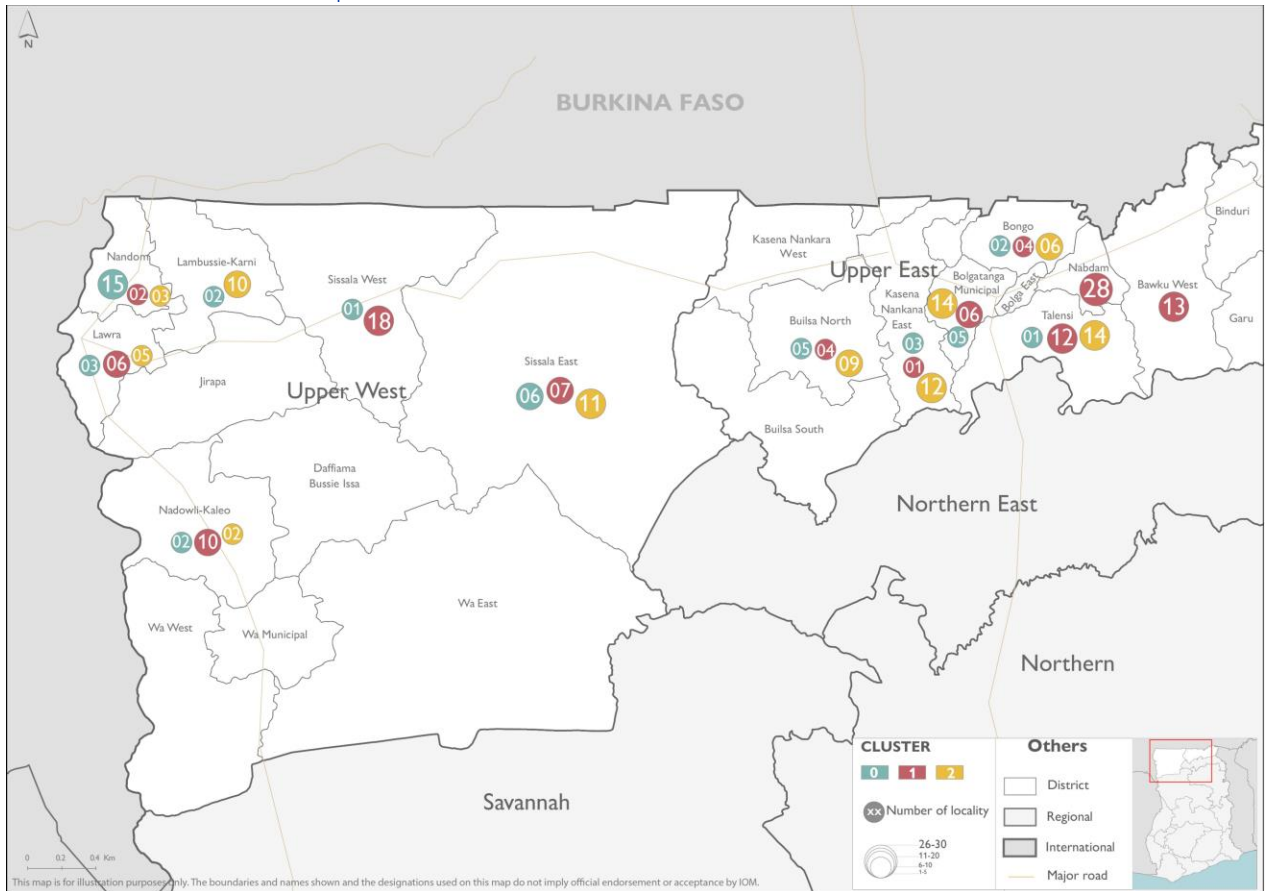
The map on the following page visualizes the assessed localities located in Ghana as divided into three clusters. Each color represents a cluster of localities with similar sets of responses to the SMI. The accompanying table provides a breakdown of the average stability index and of sub-index scores for each of these clusters. These clusters have been evaluated based on the four pillars: safety and security, social cohesion, access to livelihood and basic services and finally, resilience to climate change and catastrophes.

- Cluster 0, with 53 localities, stands out with the lowest average scores (63). The highest average score for that cluster is for social cohesion (75). The average security and services score for cluster 0 are of respectively 73 and 63. The average scores for resilience to disasters are low (32).
- Cluster 1, with 111 localities, has the highest score (96). It has the highest average on social cohesion scores (84). Scores for security and services are relatively good and similar (74). Average score for resilience to disasters is also low (41) but is higher compared to other clusters.
- Cluster 2, with 78 localities presents relatively higher scores but lower than cluster 1 with an average security score of 73 and an average social cohesion score of 79. This cluster indicates a need for efforts on access to services (with the lowest score being at 59) as well as for resilience to disasters (23).

Table 6. Average SMI and sub-index scores by cluster

	Stability Index	Services Sub-Index	Security Sub-Index	Cohesion Sub-Index	Resilience Sub-Index	Number of Localities
Cluster 0	63	63	73	75	32	53
Cluster 1	96	74	74	84	41	111
Cluster 2	93	59	73	79	23	78

Map 2. Clusters of localities with similar characteristics



## 6. RECOMMENDATIONS

The following recommendations are formulated in order to maintain or create conditions for an enhanced stability:

- In order to prevent conflicts or crises and to strengthen social cohesion, it may be beneficial to set up preventive mechanisms such as early warning systems.
- Strengthen legal formal remedies in the regions.
- Carry out awareness raising to increase security and prevent the effects of cattle theft in the communities.
- Improve cooperation between security forces.
- Conduct awareness sessions in localities on how to access land.
- Promote responsible use of natural resources and establish environmental management systems.
- Reinforce the presence of public sector employees.
- Strengthen security and social cohesion activities such as community sports involvement.

Regarding the resilience to disasters, a major challenge in the assessed areas, the following recommendations have been formulated :

- Organize awareness sessions on the impact of natural hazards.
- Create/revitalize an inclusive mechanism for disaster risk reduction in the two regions:
  - Establish disaster risk reductions committees trained on natural hazards and how to reduce their impacts
  - Organize simulation exercises including all communities (host and refugees, asylum seekers)
  - Create/revitalize early warning systems
- Plant trees in order to mitigate the impact of storms.
- Mitigate the impacts of droughts with dugouts that will also serve as water storage for agricultural activities.



## APPENDIX I: Methodology

### A. Selection of localities

The selection of localities was as broad as possible in areas hosting populations affected by displacement in Ghana. A total of **242 locations** were covered in the districts of Upper East region and Upper West region. A list of localities to be assessed was provided by the NADMO based on these criteria :

- The regions are most affected by disasters and/or displacement of populations
- The locations are accessible

The objective was to have a large enough number of localities at the regional level to ensure a solid foundation for statistical analysis. A locality is the administrative level 4 (lowest level in Ghana). This level has a representation, whether formal (State) or informal.

### B. Solutions and mobility index calculation

The Solution and Mobility Index (SMI) calculation begins with the survey design: this tool was developed with substantive input from community stabilization and Humanitarian-Development-Peace Nexus experts. It includes sets of questions assessing the conditions in a locality that are determined to be 1) potential indicators of stability and 2) possible to rank in terms of their stability implications. Questions are divided into five categories: anchor questions (perceptions about stability), safety and security, social cohesion, access to livelihood and basic services and finally, resilience to climate change and catastrophes.

Before index calculation, responses are ranked ordinally from best to worst case scenario. For the calculation of the index, the logistic regression method is employed for each perception question. By consolidating the scores from each question, the overall SMI score is obtained for each locality.

### C. Sub-index calculation

In addition to the SMI score, four distinct sub-indices are generated using the variables from each of the four survey themes: security, social cohesion, access to services and resilience to disasters. The sub-indices are calculated separately by taking the average of questions related to each theme and then, by scaling them between 0 and 100. The overall stability index score is not an average of these three sub-indices. The sub-indices facilitate the identification of localities that may require specific attention in any of these sectors.

### D. Logistic regression

The logistic regression is a statistical analysis technique commonly used to explore the relation between a dependent binary variable (Y) and a set of independent or explanatory variables. It allows modelling the probability that the dependent variable (Y) takes a certain value based on the values of the explanatory variables. The logistic regression can be used to analyse the impact of each explanatory variable on the dependent variable and to predict the values of the dependent variable based on the values of the explanatory variables.

In the context of the Solution and Mobility Index, the logistic regression is used to analyse the relation between the explanatory variables (e.g., security indicators, social cohesion indicators, or basic services indicators) and the dependent variable (a specific perception question).

### E. Cluster generation

To facilitate the analysis of groups of localities, **clusters** are created using the K-Means machine learning algorithm, where the K is determined by using the elbow methods. K-Means allows for the identification of groups of localities that are the most similar across all the provided inputs.

### F. Limitations

Some localities which were not accessible during the data collection period were not assessed due to security or logistical reasons. This may have introduced bias as data from some of the least secure locations were excluded from the analysis. This limits the generalization of the SMI findings to extremely insecure localities.

It is important to note that the SMI is based on key informants' perceptions of stability and reports of the conditions in their own locality and does not claim to provide an objective measure of this complex topic. Key informants are not randomly selected and may have different opinions about the stability in their locality than some of their neighbors.

## APPENDIX II: Indicators

### ANCHOR QUESTIONS: PERCEPTION OF STABILITY

These key indicators were used to measure the perception of stability in each locality. The key indicators were then tested against each of the thematic indicators below to identify the most influential thematic indicators on the perception of stability.

#### Feeling of Stability in the Locality

Does the locality feel safe and stable or unsafe and unstable?

#### Ability to Continue Living in Locality

Do people in the locality feel that they need to leave within the next six months?

#### Changes in Perception in the Last 6 Months

Do people feel more or less hopeful about the state of the community than they did six months ago?

### SCALE 1: LIVELIHOOD & SERVICES

#### Shelter Access and Quality

Proportion of the community that has access to shelter and conditions of shelter.

#### Damage to Homes

Level of damage to homes due to conflict, and whether reconstruction is underway.

#### Primary Education

Access to primary education and availability of schools in the locality or in neighbouring towns

#### Health Center and Medical Care

Access to functioning health center in the locality or in neighboring town

#### Local Market

Whether markets are open regularly and supplied

#### Electricity

Electricity access and reliability in the locality

#### Drinking Water

Drinking water access and availability in the locality.

#### Farmland & Fishing Grounds

Extent of fishing grounds and farmland being used in the locality

#### Presence of Public Sector Employees

Whether public sector employees are present and how they reacted to the conflict.

#### Internet and Communications Technology

Access and reliability of internet or phone services.

### SCALE 2: SOCIAL COHESION

#### Illegal Occupation of House, Land and Property

*Land, habitat or property occupied illegally (without authorization from family, neighbors, local authorities)*

#### Robbery Personal Effects

*Robbery of personal belongings reported in locality in the last 6 months*

#### Cattle Theft Reported

*Cattle theft reported in the locality in the last 6 months*

#### Daily Public Life

*Whether residents are able to carry out basic activities without worry (going to the market, letting children play outside, street vendors, etc.)*

#### Community Support

*Likelihood of cooperation between neighbors in case of problems (such as with the supply of water or food) in the locality*

#### Community Tension

*Incidents or clashes involving two groups (religious, ethnic, herders/farmers, displaced/returnee/host communities) in the locality*

#### Equal Access to Services

*Populations in the locality have equal access basic services and resources no matter their age, sex or group (ethnicity, clan, displacement status)*

#### Identity Documents

*Level of identity document possession or access in the locality*

#### Participation in Public Affairs

*Level of participation in local public and political life (civil society organizations, unions, committees, social gatherings, religious groups)*

### SCALE 3: SAFETY AND SECURITY

#### Recent Security Incidents

Whether there have been serious security incidents in recent months

#### Security Incidents – Resources

Trends in the number of security incidents linked to resource tensions (cattle raiding, land conflict, etc.) over past three months.

#### Security Incidents – Non-State Armed Groups

Trends in the number of security incidents linked to NSAG activities (kidnapping, terrorist attacks, raids, etc.) over past three months.

#### Petty Crime

Trends in the number of petty crimes (theft, pickpocketing, vandalism, public intoxication, etc.) over past three months.

#### Community Concerns About Security

How concerned residents feel about their security (kidnapping, crime, fighting between armed groups, etc.).

#### Police Presence

Presence of police/gendarmerie in the locality

#### Security Forces Presence

Presence of security forces in the locality

#### Non-State Armed Groups Presence

Presence of Non-State Armed Groups in the locality

#### Freedom of Movement

Residents' freedom of movement (to markets, to their homes, to workplaces, to farms, etc.) in the locality

#### Formal Curfew

Formal curfew for security reasons enforced by State

#### Informal Curfew

Informal curfew enforced by Non-State Armed Groups

#### State of Emergency

Whether the locality is under a state of emergency

#### Legal Remedies

Whether residents have access to legal remedies to resolve disputes

### SCALE 4 : RESILIENCE TO CLIMATE CHANGE AND DISASTERS

#### Frequency of disasters

*Type of disaster*

#### Scholarization

Frequency of damages to educational infrastructure

#### Livelihood and economic activities

*Frequency of damages to markets, food shortages in markets, level of disruption of activities due to disasters*

#### Level of resilience

*Level of resilience of homes and health infrastructures to disasters*

#### Organization and relation with the communities

*Relation between disaster risks managers, Participation of simulation exercises, Knowledge of early warning systems, organization of community in a case of disasters*

#### Information and Communication

*Knowledge of community information sources on disaster preparedness and response awareness in the past 5 years*

#### Land vulnerabilities

*Proportion of land that can be affected by disasters*

#### Policy for climate change preparedness

*Existence of local policies to prepare for climatic hazards*

#### Adaptability

*Measures put in place to increase the community's resilience to disasters*

#### Dependence on natural resources

*Level of use of natural resources and existence of alternatives*

#### Environmental health

*Means of managing non\_biodegradable and biodegradable household waste*

# SOLUTION AND MOBILITY INDEX – GHANA

OCTOBER 2023



GLOBAL DATA INSTITUTE  
**DISPLACEMENT  
TRACKING MATRIX**

## Fragility, Solution and Mobility working group, IOM

The Stability Index is part of a larger body of work developed by IOM country teams in Iraq, Somalia, the Lake Chad Basin, and elsewhere—that improve strategic planning and implementation of transition and recovery programs. The Fragility, Solutions, and Mobility working group is working to provide a series of technical and strategic guidance and tools, including drafting a methodological framework to allow for a malleable, context specific but standardized approach to measuring fragility in new and emerging operations. The goal is an IOM-led global minimum standard for data collection and responsible data management for measuring and understanding indicators of fragility and stability through the deployment of analytical models in displacement and conflict contexts.

IOM's Transition and Recovery Division (TRD) and the IOM Displacement Tracking Matrix (DTM)'s work in this space allows for new and unique approaches aimed at consolidating and packaging existing methods, to achieve stronger outcomes and to better scale programming in fragile contexts. This approach provides a foundation from which to adapt and contextualize data-based evidence for the support of strategic planning and implementation of transition and recovery programs. Grounded in the principles of responsible data management, appropriate evidence can identify core factors of fragility, solutions, and mobility at the community level, and help identify how these factors impact the overall condition of the physical location and local community, and how these evolve over time.

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DTM ACTIVITIES IN GHANA ARE SUPPORTED BY

