



EFFECTIVE CRISIS RESPONSE THROUGH MAPPING PREPAREDNESS

CASE STUDY: *BENIN FLOODING 2009* *MAPPING TO HELP DETERMINE MOST AFFECTED AREAS*

The few days following a disaster are critical for the affected population. Responders need to know where the affected area is, who is affected, what infrastructure is damaged, and what relief efforts are occurring or needed. MapAction has been helping relief agencies since 2004 to gather this crucial information, and are helping to pass on their experience to national disaster agencies, NGOs and Red Cross/Red Crescent Movement.

MapAction has many valuable lessons that can help these agencies be prepared for emergency response mapping in turn decreasing suffering of affected populations and increasing their resilience for the future. These include:

- Having a good set of basemaps and information shared amongst responders before disaster strikes,
- Having local skills in mapping and information management,
- **Using templates and standard procedures speeds up the ability to make good maps,**
- Maps help responders make a common picture of a disaster, the area affected and where relief efforts exist.

This is one of a series of case studies to show why these learning points help organisations become more resilient in emergency preparedness.



AREA: Benin, West Africa

DISASTER: Heavy Flooding

YEAR: 2009



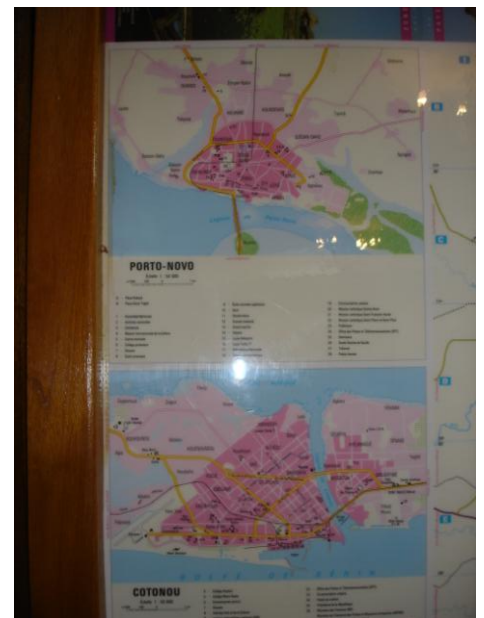
[© James Brown MapAction]

team to provide GIS and mapping assistance.

Benin is a predominantly low-lying country with a variety of different environments including coastal plains, forest and desert. Historically experiencing major flood events, Benin raised a request with the UN to avoid repeating the scenario of the previous year, when over 200,000 people had been displaced.

On the 12th July MapAction deployed to Benin and were based in the economic centre of Cotonou. The short term objectives were to carry out an initial assessment and help to resolve issues regarding water, sanitation and hygiene. Before leaving UK, the MapAction team had collected only limited coarse scale geographical data so the field team started searching for and gathering

2009 brought long rains to Benin leading to 43 of 77 communes (districts) reporting widespread flooding, resulting in the Government of Benin requesting United Nations (UN) assistance. Initial Government figures estimated that over 2,000 families had been displaced due to the floods. MapAction was consequently deployed as part of a United Nations Disaster Assessment and Coordination (UNDAC)



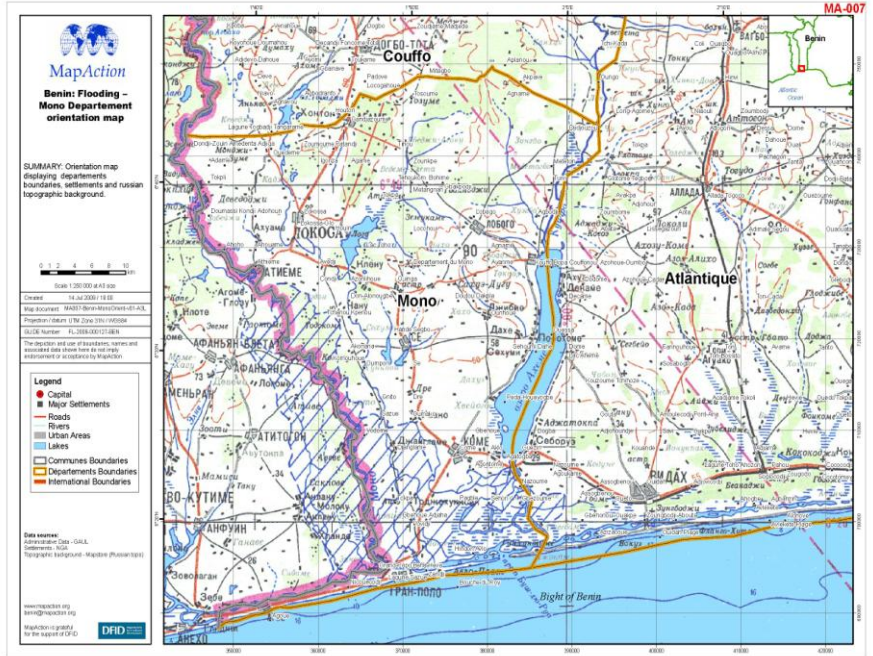
Mapping data was even gathered on arrival in Cotonou airport waiting lounge. [© Alan Mills MapAction]



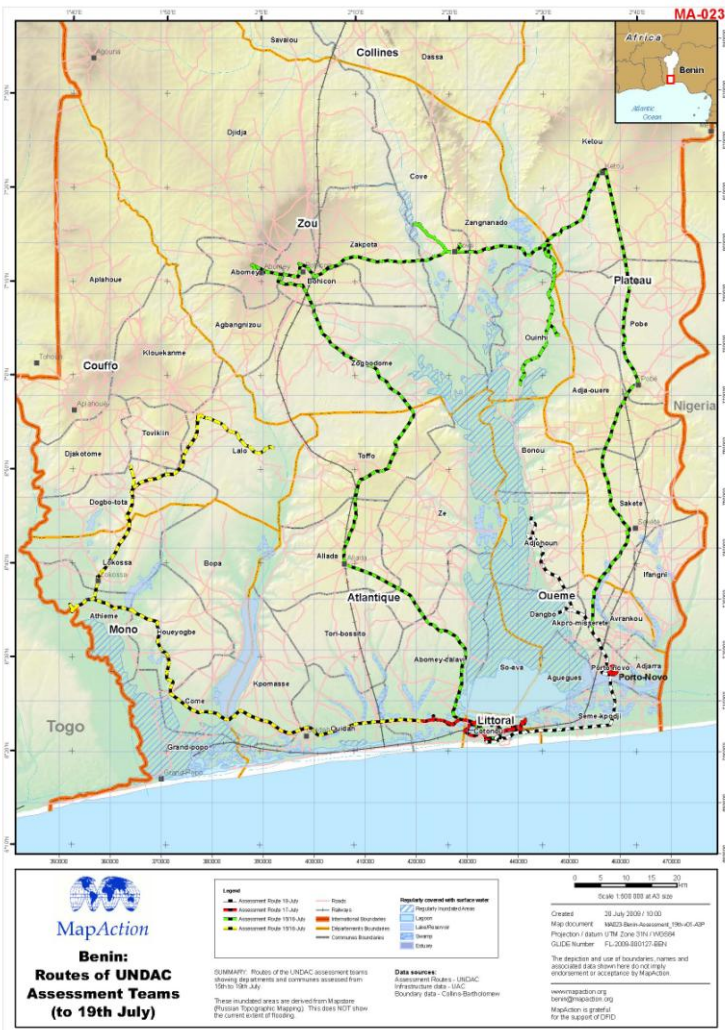
more detailed base mapping for this assessment as soon as they landed.

Field assessments were carried out by the UNDAC team, targeting those areas that were perceived to be the worst affected: Mono-Couffo in the West and Zou to the North of Cotonou. The routes taken by UNDAC assessment teams can be easily visualised on the map below.

While the field teams were gathering data on the flood extents, the MapAction team found that Russian topographic maps (see map right) showed the extent of low lying land which is normally susceptible to floods each year (the blue hashing on the map right). When the field teams returned, several places where they stopped were at the borders with these flood plains. In fact, the exceptional flooding - i.e. areas where flooding did not normally



Orientation map produced by MapAction Field Team based on Russian Topographic Maps which showed where flooding normally occurs (the blue hashings) [© MapAction]



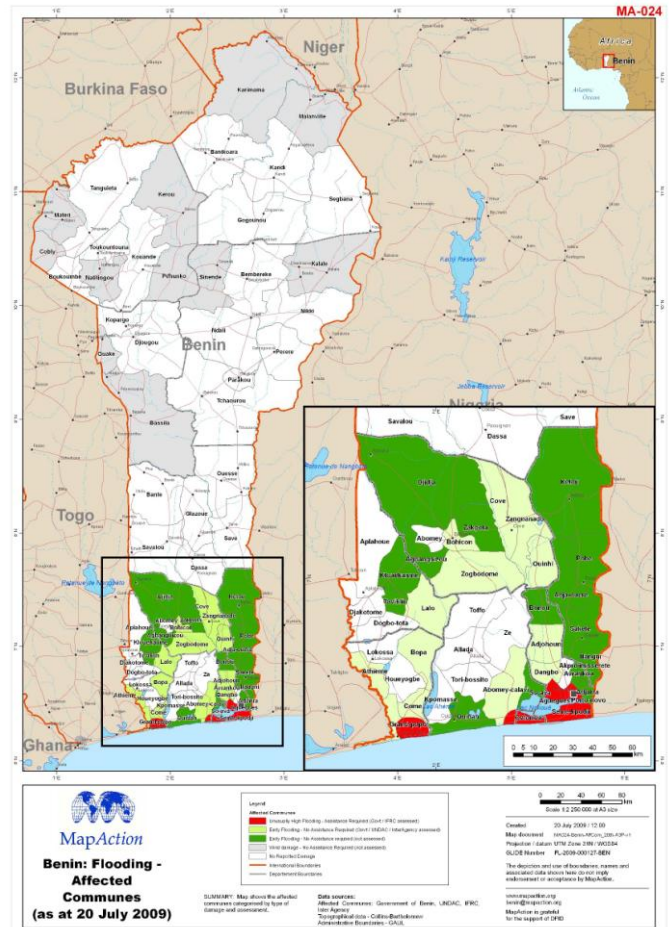
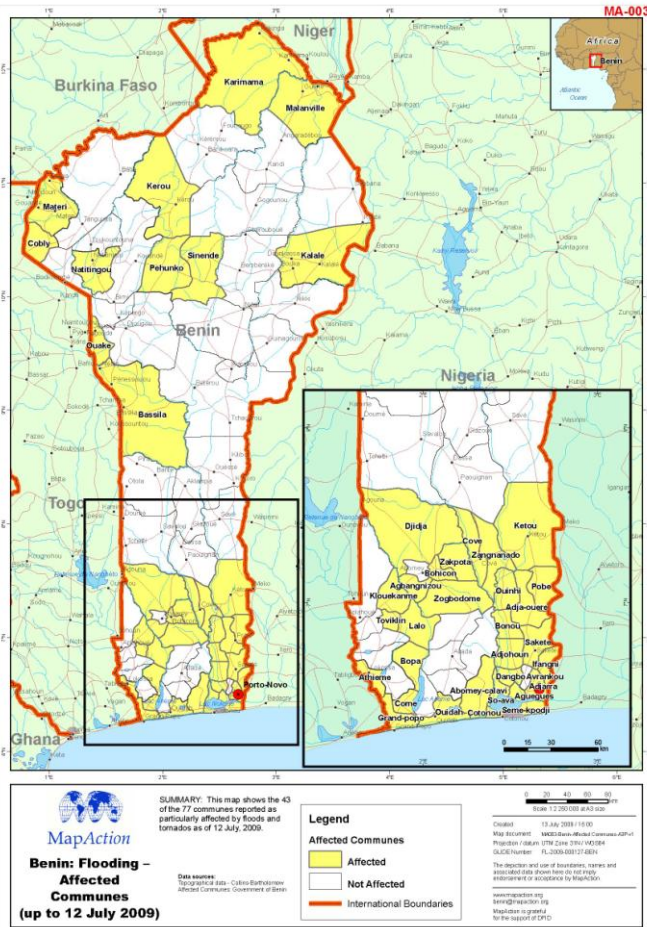
Map showing routes of UNDAC assessment teams. [© MapAction]

occur, were concentrated in a few areas mainly close to the Littoral province and the commercial capital, Cotonou.

Some satellite interpretation of flooded areas was also available, but it could not determine the difference between those areas where open water was always there, and those areas that were exceptional floods. Some tin roofs in Cotonou were also misidentified as flood water.

By consolidating the UNDAC assessment mission data with reports gathered from the International Finance Corporation (IFC), CARE International, the Benin Government and the United Nations (UN) in country teams, much more defined affected population maps of Benin could be produced.

Accurately mapping the areas affected by a disaster is important in focusing efforts and ensuring that populations needing the most assistance can be identified. Below is a comparison of the affected population maps that were produced by MapAction on the 12th and 20th July 2009. These maps demonstrate how combining the field assessments with topographic data (in effect the baseline normally flooded areas) and other reports could sharpen the picture of where most assistance was needed. As a consequence, maps to show affected areas and therefore populations were produced by the MapAction team.



Affected population maps produced by MapAction on the 12th and 20th July in Benin, demonstrating the increased understanding of the crisis following more detailed assessments and use of existing geographical mapping. [© MapAction]

The information available in the map created on the 12th July highlighted which communes were affected and which were not. Due to provision of new field data, the affected communes map made available on the 20th July introduced five categories assigned to each commune to indicate the severity of the flooding impact:

- RED - Unusually High Flooding – Assistance Required (Govt/IFRC assessed)
- LIGHT GREEN - Early Flooding – No Assistance Required (Govt/UNDAC/InterAgency assessed)
- DARK GREEN - Early Flooding – No Assistance Required (not assessed)
- GREY - Wind Damage – No Assistance Required (not assessed)
- WHITE - No Reported Damage

This later map indicates how resources can be targeted to those affected populations most in need of assistance.

These two maps of *affected communes* are a good example of how the situation presented on the ground both changed over time but also that better information from a variety of sources could be combined on a map to more accurately identify those in need. A map format works well as a visualization tool for presenting this type of information; it is easy to understand and allows the user to interpret the situational view of those affected by the flooding. Providing a time series of affected population map products enables the users of these maps to monitor an ever changing situation.

The work undertaken in Benin by the MapAction team demonstrated the usefulness of mapping the affected population. From combining data from several sources and partners, MapAction was able to communicate areas and people requiring the most humanitarian assistance. The mapping products created in Benin also allowed for the severity of the disaster to be downgraded, when the flooding was assessed to be less severe than first feared.



MapAction team member presenting one of the final map catalogues to the UNDAC team leader in the Operations Centre. [© MapAction]

Key Lessons Learned:

- Don't just rely on one source of data, use several sources from the field, reports and mapping to determine the affected area and to cross check
 - The terms "Affected Area" and "Affected Populations" are very general and it is useful to use some detail to classify what is affected and to what extent
 - Obtaining data about the baseline - i.e. what usually occurs is essential in determining where areas have been exceptionally affected - particularly with flooding
 - Satellite imagery has some use in determining flooding, but needs ground verification to avoid misinterpretation and mapping of normally flooded areas over exceptionally affected areas, as well as other confusing factors such as shiny rooftops
 - Affected area mapping helps focus both needs assessment teams and supply of essential resources to help the affected populations recover quickly.

Partner Organisations

United Nations Disaster Assessment and Coordination (UNDAC)

United Nations Development Programme, Benin (UNDP)

Office for the Coordination of Humanitarian Affairs (OCHA)

World Food Project, Dakar (WFP)

Contact MapAction

Web: www.mapaction.org

Email: info@mapaction.org

Tel: +44 (0)1494 56 88 99

Address: The Clare Charity Centre
Wycombe Road
Saunderton
Buckinghamshire
HP14 4BF
United Kingdom