

CONTEXT AND APPROACH Kenya, like many countries in Africa, is continually prone to a wide range of both naturally occurring and manmade disasters. User Needs can be defined as "the needs that a user has of a service, and which that service must satisfy for the user to get the right outcome for them"⁵.

5.1 User Needs Analysis

The main purpose of needs analysis is the user's satisfaction. As it focuses on the needs of the human, needs analysis is not limited to addressing the requirements of just software, but can be applied to any domain, such as automotive, consumer product or services such as banking. In the case of the Kenyan DRO, analysis of the User Needs is derived from the following main key priority areas as discussed in the stakeholder meetings in Kenya at both National and County level.

- o Disaster scenario priorities
- o Identifying flood events as a first priority and consideration of wildfires as second priority.
- o Communication of information in a timely manner
- o Ability to view and access satellite based mapping products.
- o Timeliness of the delivery of satellite imagery based mapping and information supporting a response.
- o Ability to share critical data between DRO during all stages of the disaster management cycle.
- o Training requirements
- o Capacity building and training for users of EO based information and satellite communications systems is essential to maximise the value they can obtain from any solution developed. Raising awareness and understanding of the potential capabilities and also limitations.
- o Train the trainer to ensure continual dissemination of knowledge and skills to allow for a sustainable long term solution.
- o Coordinated training to develop inter agency cooperation.
- o Knowledge Transfer
- o The requirement for support in the development of Emergency Operations Centres, particularly in their operation and management.
- o The requirement for support in the review and/or development of DRM Standard Operating Procedures.

5.1.1 Disaster scenario priorities

The flood scenario was repeatedly discussed as a first priority for all stakeholders who participated in recent meetings. The Western part of Kenya in particular is very prone to flood events. For example the Niando river is reported to flood every 4 – 6 months. Niando floods were due to heavy rain upstream, so excess rainfall is an early warning alert to prepare for potential floods downstream. Preparedness mapping products can support planning risk assessment for floods by providing simulated models of flood levels at different severities along with reference base map layers of assets and populated places at risk. Fire was one of the other priorities which emerged in the recent meetings with NDMU and KRC. Discussions led to the identification of a potential post-disaster product which could map the fire scars in vast areas, e.g. pastures or fields, and highlight the green vegetated areas still available for grazing purposes

5.1.1.2 Communication of timely geographic information in a timely manner

The main communication method currently used to provide geographic information during the disaster is verbally via phone or text based using a variety of commonly available messaging applications (e.g. WhatsApp). NDMU and KRCS are very often the initial DRO response to incidents and as such provide the critical coordination. Both NDMU and KRCS agree that improved fast communications are required. Information, beyond the extant verbal and messaging formats, needs to be shared by many people at different levels within different organisations. For example the ability to share data such as mapping, satellite imagery, and videos, whilst possible (and commonly practiced) using mobile phones, remains totally reliant on robust, stable mobile network coverage. There is a genuine requirement for a Common Operating Picture (COP), shared amongst all of the key DRO, driven by a mixture of on the ground reporting and other sources

(e.g. EO satellite imagery, media, international and national agencies) that could be accessed by all and where appropriate manipulated by those providing situational reporting. At present the KRCS have a GIS based reporting tool however it is only accessible via their own internal network, relies on dated Google based mapping/imagery and is limited by its ability to ingest data from other sources, such as map based incident tracking services.

5.1.1.3 Training requirements The current expertise of staff varies depending upon the entity (stakeholder), the level of administrative responsibility (national, county, sub-county level) and the degree of engagement in the public body (member of staff or volunteer). Training courses are held in NDOC about 2 – 4 times per year, whereas some other stakeholders, both in Nairobi and at county level, have training in GIS and even basic Remote Sensing skills (e.g. at the County Government of Kisumu) but this is currently not used during the response operations.

5.1.1.4 Knowledge Transfer Whilst national DRO were well resourced in terms of DRM policies and SOPs, some were beyond their last review date primarily due to lack of capacity on the part of the organisations. County level DRO had little if anything in the way of county specific SOPs, instead relying almost solely on national level policy which is not tailored to their specific requirements. The combined list of User Needs identified during engagement with key Kenyan DRO stakeholders can be found at Table 4 below.

6. USER REQUIREMENTS This section develops the needs and constraints of the users and other stakeholders into User Requirements, defined as "describing the business needs for what users require from the system⁶" which serves as a starting point for the specification of potential project solutions and associated services. In addition the inherent flexibility of SATCOM technology (i.e. lack of requirement for terrestrial connections) provides greater utility in the establishment and delivery of communication hubs (for command and control, and communications purposes) supporting temporary settlements (e.g. IDP or refugee camps) which may often be located in areas outside of mobile network coverage. This framework is often described as a four phase lifecycle as seen below in Figure 3:

3.2 Disaster Scenarios The disaster scenarios in which the key stakeholders identified and engaged with by the project are primarily responsible for, are grouped into the following disaster types: ??Accidents (industrial, vehicle / plane crash, urban fire, bush fire) Kenyan stakeholders have identified that amongst all of these potential events, floods represented the most frequent disaster occurring in Kenya, Wildfires were also identified as regularly occurring large scale disaster events.

3.3.4 Doctrine Use Case Scenario The review of and in some cases the development of DRM policies, and the procedures by which those policies will be implemented, will be critical to ensuring that the relevant DRO have the necessary guidelines, operating procedures and contingency plans, ranging from the strategic to the tactical levels which can then be rehearsed, reviewed and amended during the course of unilateral and joint exercise events. In addition to the selection of these counties, the project identified the desire of the GoK to establish Regional Multi Agency Coordination Centres (RMACC), under the aegis of Regional Commissioners, as an additional layer of capability between the national and county levels. This scenario can be simulated prior to a flood event occurring and is therefore extremely useful in allowing DRO planners to model and develop evacuation plans for people affected by floods, identify safe/dry areas where to place resources and power generators (if no power is available) and to plan accessibility and transportation routes. The 4 counties selected provide the broadest range of criteria including coastal, urban and rural geographical

areas; areas and populations subject to regular naturally occurring and man-made disasters; and with some form of DRM infrastructure and organization. SatDRR proposed solutions will afford users resilience, specifically at key nodal points at the national (strategic) and county (tactical) levels, regardless of damage, congestion or unavailability of terrestrial based mobile networks.

3.6.2 Satellite Communications Use Case Scenario

Although the SATCOM equipment is unlikely to provide much in the way of mitigation in relation to the disaster occurring, it will assist in mitigating the risks that responders are exposed to, thus reducing risk of injury or death to on the ground responders, the resultant loss of personnel/manpower, risk of loss or damage to vehicles and equipment and costs associated with the above. Climate change is having an effect on the frequency and intensity of the natural disasters, whilst a rapid growth in population, increasing urbanization and conflict is contributing to other events including disease, environmental pollution and mass migration. As part of the SatDRR project Milestone 1, the Consortium conducted an extensive period of stakeholder identification, analysis and assessment, the aim of which was to map the Kenyan Disaster Risk Management (DRM) landscape. The counties were selected from an initial list of 8, through consultation with NDOC, NDMU and KRCS, and scored against a series of criteria including the range and occurrences of disasters, the size of the population, terrain, and security. In addition to the engagements conducted by the in-country team over this period, representatives from Airbus, Avanti and GRC conducted a visit to Kenya during the period 4–7 September 2018, with the aim of visiting the key stakeholders and determining the most appropriate technical solutions. The proposed project SATCOM solutions will allow the users resilient communications regardless of the status of existing networks..5.