

Table 1: INFORMATION NEEDS FOR PLANNING HD CAMPAIGNS

| Info                           | Detail  | Remark  | Source  | Ideal - Realistic Scale                  |
|--------------------------------|---|---|---|--|
| <b>1. Mission announcement</b> |   |   |   |  |
|                                |   | Desk work 1 week up to 6 months   |   |  |
| Global topographical data      | Relief (altitude and slope)   |   | DCW, road maps, WEB                                 | 1:°250,000 – 1:1,000,000                 |
|                                | Hydrographic network  | Permanent   | DCW, WEB  | 1:°250,000 – 1:1,000,000                 |
|                                | Inhabited areas location and toponymy   |   | DCW, road maps, WEB                                 | 1:°250,000 – 1:1,000,000                 |
|                                | Administrative limits   |   | DCW, road maps, WEB                                 | 1:°250,000 – 1:1,000,000                 |
|                                | Roads   |   | DCW, road maps, WEB                                 | 1:°250,000 – 1:1,000,000                 |
| Local topographical data       | Practicable roads and bridges   |   | TC, VHRSI, HRSI, AP, (RP)                           | 1:°50,000                                |
|                                | Hydrographic network  | Permanent and temporary   | TC, VHRSI, HRSI, AP                                 | 1:°50,000                                |
|                                | Inhabited areas location and toponymy   |   | TC, RP  | 1:°50,000                                |
|                                | Land use  | Towns, villages, cultivated areas, cultivable areas, forests, swamp, etc. | TC, VHRSI, HRSI, AP                                 | 1:°50,000                                |
|                                | Areas liable to flooding  |   | TC, VHRSI?, HRSI?°, AP?, RP°1:°50,000               |  |
|                                | Important infrastructures   | Dam, high tension line, industries, hospitals, schools, etc.              | TC, VHRSI, AP, RP                                   | 1:°50,000                                |
|                                | Military buildings  |   | TC, VHRSI, AP, RP                                   | 1:°50,000                                |
| Climate                        | Precipitation and wet/dry seasons   |   | Meteorological data                                 | 1:°250,000 – 1:1,000,000                 |
| Conflicts                      | Which were the parties (guerrilla or military)?                                 |   | Non-geographic                                      | Press, RP                                |
|                                | Where were the areas of conflicts/fighting?<br>Which were the ammunitions used? |   | Press, RP<br>Geographic: DB ammunitions per country | 1:°250,000<br>RP                         |
|                                | How are the ammunitions placed (Pattern)?                                       |   | Non-geographic                                      | RP                                       |
|                                | Changes related to conflicts  | Land use and roads  | HRSI  | 1:°50,000                                |
| Refugees (IDPs)                | Where do they come from?  |   | UNHCR, RP   | 1:°250,000 – 1:1,000,000                 |
|                                | Where are they?   |   | UNHCR, RP   | 1:°250,000 – 1:1,000,000                 |
|                                | How many?   | Evaluation from surface covered by camps                                  | UNHCR, NGO refugees intervening person, AP, HRSI    | 1:°50,000 – 1:°10,000                    |
|                                | Where do they have to go?   | Relocation  | Government, UNHCR, HRSI, TC                         | 1:°250,000 and 1:°50,000 – 1:1,000,000°? |

DCW: Digital Chart of the World  
 TC = topographic maps  
 AP = aerial photographs  
 VHRSI= very high-resolution satellite images  
 HRSI = high-resolution satellite images  
 DB= database  
 RP = resource person

# NOTES FROM THE FIELD

| Info                                   | Detail   | Remark  | Source  | Ideal - Realistic Scale    |
|--|--|---|---|----------------------------|
| Cultivable areas                       |  |   | AP, VHRSI, HRSI   | 1:°50,000                  |
| Economy                                | Which economical activities are still working? Where are they?   |   | RP, TC, Atlas   | 1:°250,000<br>-1:1,000,000 |
|  | Which economical activities should be settle up? Where are they?   |   | RP, government, donors  | 1:°250,000<br>-1:1,000,000 |
| Government                             | Which attitude towards demining? Where are the areas the most important  |   | Government, RP  |                            |
|  | for the economical reconstruction of the country?  |   | Government, RP, donors, Atlas, etc.   | 1:°250,000<br>-1:1,000,000 |
| Injured/Dead                           | Mine accident description and localization   | Localization per village or per district  | BD IRCRI (Croix-Rouge International) and hospitals  | 1:°250,000                 |
| Demining                               | Which organizations (International, national, NGO, etc.)? What do they do? How (material, training, etc.)? Field staff and management Where are they working? Where are the cleared areas? | Geographic (per province)   | WEB, embassies, Organizations<br><br>Organizations<br>Organizations<br>Organizations<br>Organizations, UNDP<br>Organizations, UNDP, (BD?) | 1:°250,000<br>1:°250,000   |
| Level 1                                | Organization responsible of Level 1?<br>Method to make Level 1?°   | See also Phase 2  |   |                            |
| <b>2. Field Survey</b>                 |  |   | On the fieldDuration: a few months  |                            |
| Level 1                                | See phase 1: If Level 1 exists, the information below will be obtained from the organization that made it.   | Available maps? DB? Reliability?  |   | 1:°250,000                 |
|  | Collateral Information   | Government, population, hospitals, NGO, UNDP, BD, maps  | DB?°  |                            |
|  | Overview of mine field location  | Information origin and reliability  |   |                            |
|  | Suspected areas  |   |   | 1:10,000, 1:50,000         |
|  | Marking  |   | Map, mark in the field  |                            |
| Mine fields                            | Localization and extent  |   | Government, population, hospitals, NGO, UN, sketch  | 1:°50,000                  |
|  | Who put it there and how (Pattern)?<br>Types of mines  | Link to mine DB   | Government, population<br>Government, population, NGO, UN   |                            |
|  | Important potentially mined buildings  | Precise localization and nature: Hospitals, Industries, military buildings, schools, villages, trenches, etc. |   | 1:°250,000                 |
| Communications roads                   |  | Verify practicability   | Population  | 1:°250,000                 |
| Level 2 already done and cleared areas |  | Geographic  | Government, NGO, UN   | 1: 5000                    |
| <b>3. Planning</b>                     |  |   | Desk workDuration: 1 week   |                            |

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|-----------------------------|--|--|---|-------------------------|
| Priorities                  | Which one?   | Economical, agricultural, population social          | Government, local authorities, donors demining organization                     | 1:°250,000              |
|                             | Who is setting them?   | Government, UN, local chiefs, demining organizations |   |                         |
|                             | Which are the constraints? Easy/difficult areas to clear                                     | Seasons, roads                                       | Demining organization, Phase 1 results  | 1:°250,000              |
|                             | Which means are available for demining (dogs, manual, robot, etc.)?                          |  |   |                         |
| Task scheduling             | Map production: areas to clear first, explicit constraints (seasons, etc.) (ex symbols)      |  |   |                         |
| <b>4. Level 2: Demining</b> |  | Work field Duration: <5 years                        |   |                         |
|                             | Which detailed map available?  |  | Cartographic inventory, national geographic institute, etc.                     |                         |
|                             | Precise mine field localization and extent   | Areas to clear                                       | Work field: from mine field corners, draw automatic sketch of mine field border | 1:°10,000               |
|                             | Nature of area to clear  |  | AP, work on the field   | 1:°10,00                |
|                             | Types of removed mines   | Geographic (per mine field)                          | Work on the field   |                         |
|                             | Existence of traps   | Geographic (per mine field)                          | Work on the field   |                         |
|                             | Clearing methods and techniques (manual, automatic, dogs, etc.)                              | Geographic (per mine field)                          | Demining organization   |                         |
|                             | Personnel  | Number of deminers and management                    | Demining organization   |                         |
|                             | Working pace of the clearing   | Depends on surface type, season, munitions, traps    | Automatic computation   | 1:°10,000               |
|                             | Productivity   | Number of cleared m <sup>2</sup> /deminer/month      | Automatic computation   | 1:°10,000               |
|                             | Security   | Deminer accidents                                    | Work on the field   |                         |
|                             | Localization of cleared areas + Precision  |  |   | 1:°10,000               |
| Planning update             | Based on the surface cleared compared to the surface initially estimated. New map production |  | Syntheses of demining results   | 1:°250,000              |
| <b>5. Level 3</b>           |  | Work on the field Duration: indeterminate            |   |                         |
|                             | Which method is used to control the demining quality?  | Non-geographic                                       | Organization responsible for controlling  |                         |
|                             | What is the quality of the demining?   | Geographic (per mine field)                          | Work on the field   |                         |

| Info                             | Detail   | Remark                      | Source      | Ideal - Realistic Scale |
|----------------------------------|--|-----------------------------|-------------|-------------------------|
|                                  | Accidents over the cleared areas                                     | Geographic (per mine field) |             |                         |
| <b>6. End of Mission</b>         |  |                             |             |                         |
| Conformity to mission objectives | Is the use of the cleared areas in accordance with the declared use? |                             | VHRSI, HRSI | 1:°50,000 – 1:°10,000   |

**Table 2 Tasks for the PARADIS interface**

**1. Mission announcement (Global Scale ~ 1: 1,000,000)**

- A. Visualizing a regional topographical mapping existing at global scale, scanned and geo-referenced topographic map or existing vectorial DB.
- B. Overlaying and mapping existing geo-referenced UXO – suspected mine field – number of accident DB of Level 1 (if exists)
- C. Visualizing the extension of all types of geographic data
- D. Printing and reporting

**2. Field survey (Regional Scale ~ 1: 50,000)**

- A. Visualizing space map, conducting a preliminary interpretation and overlaying topographical mapping
- B. Introducing GPS reference points measurements into the system and correcting the geo-referencing of the satellite imagery
- C. Overlaying geo-referenced UXO – suspected mine field selected into the Level 1 DB, if exists; if not, filling a form in IMSMA
- D. Creating a map of the past conflicts (legend to be defined) and visualizing on map of the IMSMA information about conflicts
- E. Computing the number of UXO–suspected mine field per administrative area
- F. Modifying topographical data according to ground survey and the satellite image interpretation: adding, modifying or deleting vectors; adding, modifying or deleting attributes of vectors
- G. Getting feedback on image interpretation to SGR/IM
- H. Printing and reporting

**3.1. Planning for each clearance team (Regional Scale ~ 1: 50,000)**

- A. Visualizing the priorities (selecting or setting locations and adding an attributes to set the priorities) or setting the priorities according to UN or the country taking into account future refugees or displaced people resettlement
- B. Visualizing the constraints: flooding, accessibility, etc.
- C. Getting a user decision on the team localization
- D. Logistic facilities for teams (distance to water, electricity, roads, etc.)
- E. Computing the estimated time to clear a mine field according to the estimated size (from the DB or from the ground?) of suspected mine field, the demining means (number of detectors), time to clear a square meter (parameter to be fixed by the user according to the vegetation cover, the duration of a working day, the mine density)

**3.2. Planning for each roving team (Regional Scale ~ 1: 50,000)**

- A. Mapping some DB attributes of UXO or suspected mine field (i.e., size)
- B. Comparing the villages of the IMSMA DB to the ones on the space map
- C. Encoding progressively the number of UXO found in each village
- D. Visualizing the updated map of the number of UXO found in each village

- F. Printing and reporting

**4. Clearance: drawing the mine field (Field – team scale ~ 1:5,000)**

- A. Overlaying the detailed topographic map or the space map and its interpretation
- B. Overlaying geo-referenced UXO – suspected mine field selected into a DB
- C. Filling/creating/modifying a follow up form of clearance activities with information such as precise location (GPS points, reference of map, reference of image or photo), descriptive information of the mine problem coming from the Level 1 DB (injured person, etc.), vegetation cover
- D. Drawing and/or updating a sketch of the mine field on a spacemap (if available)
- E. Printing and reporting

**5. Clearance: follow up of each section (Field – section scale 1: 500)**

- A. Overlaying of a grid (size and orientation of the grid defined by the user) on the sketch
- B. Printing the sketch with the grid
- C. Encoding the number and the type of mine or UXO found in each cell of the grid
- D. Filling the grid each week according to the cleared area
- E. Printing and reporting

**6. Updating the planning from the mine field to the region (1: 5000 to 1: 50,000 to 1: 1,000,000)**

- A. Computing the cleared area and the area to be cleared and updating the estimated time required to clear the area according to the demining means (number of detectors) and the time needed to clear a square meter (parameter to be fixed by the user according to the vegetation cover, the duration of a working day, the mine density).
- B. Following up with indicators (to be determined) to be visualized and computed at several geographic scales (grouping and generalization procedures) for a feedback to the headquarters
- C. Printing and reporting

**Remarks:**

It seems necessary to maintain an attribute related to the scale at which any information was collected.  
The follow-up of a mine field through time should be possible.