MAPPING ARCHEOLOGICAL SITE MEMORY

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1- Brief Introduction

Research driving force

- in 1977 war b/n Ethiopia & Somalia
- POW detained at Haaway for 10 yrs
- >4000 POW detained until 1988
- Thousands deceased and buried there
- 3527 repatriated to Ethiopia in 1988
- There is high need to bring the dead remains back home
  but no geo-spatial information about what was where
  except in people’s mind
- Number of survivors is getting low (natural death)
- Many are loosing memory due to trauma and age
2- Traditional Topographic Mapping Procedures

Steps:-
1- Aerial (photography/ imagery) survey
2- Image control points geodetic survey
3- Photogrammetric works (ATBA, DTM)
4- Field Data Collection (in the AOI)
5- 3-D Feature Extraction & Contouring
6- Orthophoto Generation
7- Map Compilation & Dissemination
3- Remote Mapping Methodology and Inputs

Guiding Principle
- Participatory (Expert + Survivors Ex-POW)

Methodologies
- Independent Mental Sketch Maps
- Place Names (Towns, Water Bodies, Land Marks, etc…)
- Mental Sketch Maps Compilation & Discussion
- Using Expert Knowledge/Skill

Inputs Include
- Google Earth(Image Interpretation/site Identification)
- GPS Geoplaner Online(Elevation Point Collection)
- Arc/Map(Analysis, Mapping, Cartographic Visualization)
3.1. Remote Mapping Workflow

Google Earth ➔ GPS Geoplaner

(Image Interpretation) ➔ (Elevation Point Collection)

ArcGIS (Arc/Map v. 10x)

(Elevation Data Analysis, Contour File Generation, Digitizing, Visualization)

Haaway Topographic Map 1:100000

(Map Verification)
4- Data Analyses and Topographic Mapping

4.1. Rigorous image identification and Elevation Point Collection was conducted by the help of Google Earth image and GeoPlaner GPS :-

Google Earth + GPS GeoPlaner online

http://www.geoplaner.com/#Accuracy
4- Data Analyses and Topographic Mapping  Cont’d…

4.2. Area of interest (AOI):

https://www.google.com/maps/@1.1802771,43.7158945,477m/data=!3m1!1e3

Deceased POW

- Women
- Men

Death

Barrack Number

https://www.google.com/maps/@1.1802771,43.7158945,477m/data=!3m1!1e3
4- Data Analyses and Topographic Mapping  Cont’d…

4.3. Elevation points collected (X,Y,Z):

http://www.geoplaner.com/
..\Haaway_Elevation_Points.xlsx

4.4. Accuracy of coordinates and heights

Source: Map Data 2017 Google Imagery/ Astrium Digital Globe
Horizontal Accuracy: A precision of 1m
Elevation Accuracy: 0.1m or 10cm
The Datum or Reference Ellipsoid : WGS 84 (World Geodetic System 1984)
Map Projection: Universal Transverse Mercator(UTM)
Hemisphere: N
Zone: 38
4- Data Analyses and Topographic Mapping  Cont’d…

4.5. Kriging
4- Data Analyses and Topographic Mapping  Cont’d…

4.6. Hypsograph
4- Data Analyses and Topographic Mapping  Cont’d…

4.7. Final Contour with label
5- Products and Method of Verification

5.1. Transformed Map
5- Products and Method of Verification Cont’d…

5.2. Map with contour overlay
5.3. Final Archeological Map (1979-1988)
6- Temporal Analyses

POW detention camp site

before 1990

in 2003
7- Location verification

A) Map verification

7.1. Visual analysis (Satellite image)
7.2. Analysis on Topographic map NA-38-100
(Source: University of Texas Libraries)
http://www.lib.utexas.edu/maps/topo/somalia/
7.3. Map verification with respect to sheet NA-38-100

B) A.P. Dempster’s (1968) Theory of Evidential Belief Function was used.
- Belief
- Disbelief
- Uncertainty
8- Conclusion and Recommendation

7.1. Conclusion
Arc Map enabled the historical incidence participatory mental map project to be successful both in terms of geo location, non spatial information and for future purpose.

7.2. Recommendation
The finding reveals that it is recommended to follow the procedures for similar archeological mental mapping projects to preserve history and to conduct in depth research of similar types by national and international research centers as a contribution for World Peace!
MAY PEACE PREVAIL ON OUR WORLD!

THANK YOU
Q & A