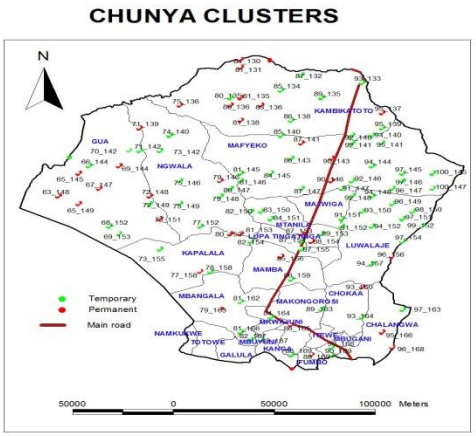
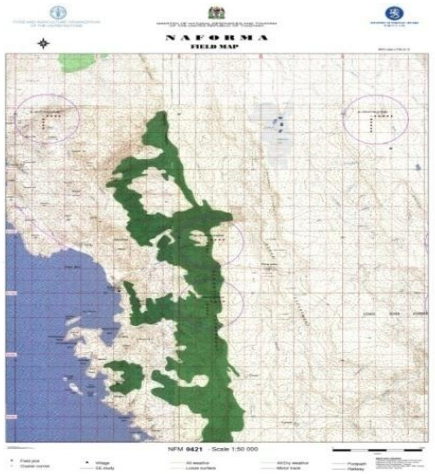
National Forestry Resources Monitoring and Assessment of Tanzania (NAFORMA)

NAFORMA MAPPING TECHNICAL WORKING GROUP (TWG)

REGIONAL COURSE ON REDD+ MRV, NFI AND MONITORING 11-15th JULY 2011, SUA, MOROGORO





Elikana John

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INTRODUCTION

- The mapping TWG is involved in fullfilling objective 2 and 4 of the NAFORMA project.

i. Strengthern the quality of FBD to collect, analyze, update and manage the needed information of forest and trees under NAFOBEDA

ii. Preare national maps of forests and land use based on harmonized classifiaction and forest related definitions, with compatible storage and retrieval under NAFOBEDA

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ABOUT NAFORMA MAPPING SECTION

- Mapping Technical working Group (TWG) is one of the componet under NAFORMA
- The team comprises of 1 mapping consultant and 6 FBD employees
- It is central part that preapre all necessary maps and images to be used, both in the office and field by the field teams.

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ROLE OF MAPPING TWG

- Organizing the field plots into proper spatial location, by coordinates, wards and districts
- Preparation of field plan maps by wards and district
- Preparing and printing Field maps to support the field teams.
- Classification of land use land covers using appropriate remote sensing images
- Produce final Land Use Land cover Map for the year 2011

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TRAINING OF NAFORMA MAPPING PERSONNEL

- Defining the training needs of TWG Mapping as well as the needed equipment was done during May/June 2010

- The tasks for producing the field maps needed by the field teams for accessing plots was conducted at FBD by FAO/FIN Remote Sensing Expert.

- This allowed the production of the field maps to start.

- Based on the defined training needs the entire TWG Mapping had intensive trainings during August – September 2010 on;
  - i. ERDAS Imagine software for achieving fundamentals of ERDAS Imagine
  - ii. Working with UN-REDD project to learn by doing basics of GIS and remote sensing
  - iii. Open Source tools for remote sensing and GIS ;
    - Grass, Quantum GIS, bash programming

To demonstrate the use of different free and open sources tools in spatial data processing, remote sensing based analysis & mapping in the context of LULC change applications.

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FIELD MAPS PRODUCTION

- Grouping field plots in the geographical zones (UTM ZONE 35, 36, 37)
- Classification of field plots into political boundaries (wards, district, region)
- Peparation of the field maps; this is based on the NAFORMA zone (Eastern, Southern, Southern Highlands, Western, Central, Lake and Northern zone)
  - Eastern zone, southern zone, Southern Highlands and central zone both digital and hard copy maps COMPLETED
  - Western, Lake and Nothern zone are in soft copies
- Clusters linked with wards to help field work planning

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FIELD MAPS PRODUCTION cont…….

- Field map production uses topographic sheets as the background to indicate roads, rivers, villages etc
- This help to access the clusters basing on these features
- NOTE: In some zones the topographic sheets are missing like parts of western, central, Lake and Nothern zone
- This was substituted by use of High resolution imagies in Google Earth

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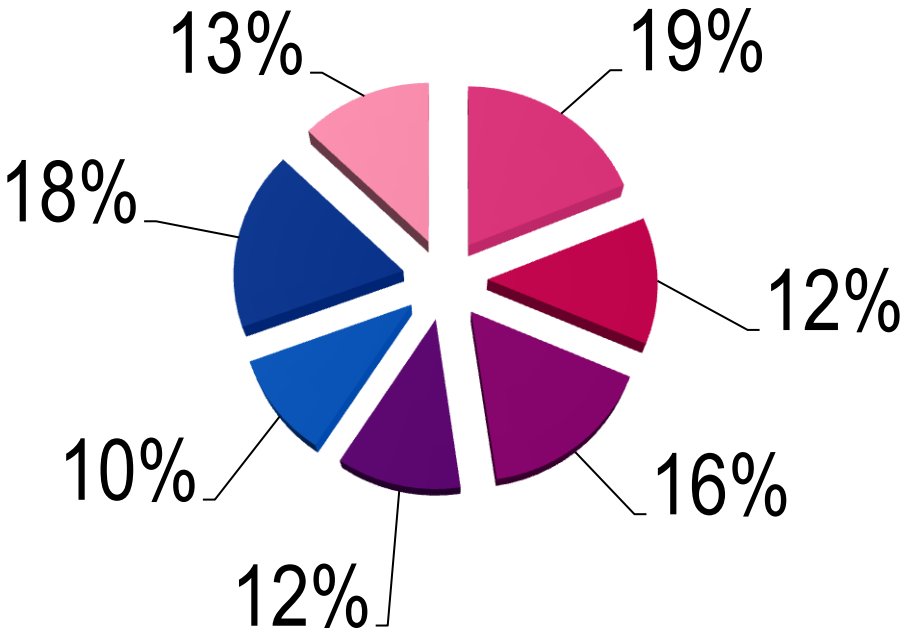
% COVERAGE OF FIELD MAPS FOR 7 ZONES



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FIELD MAPS PRODUCTION USING TOPO SHEETS & GOOGLE EARTH

Zone	Maps per zone	Total copies
Eastern	304	1520
Southern	201	1005
Southern Highland	263	1315
Western	186	930
Central	164	820
Lake	285	1425
Nothern	207	1035
Total field maps	**1610**	**8050**

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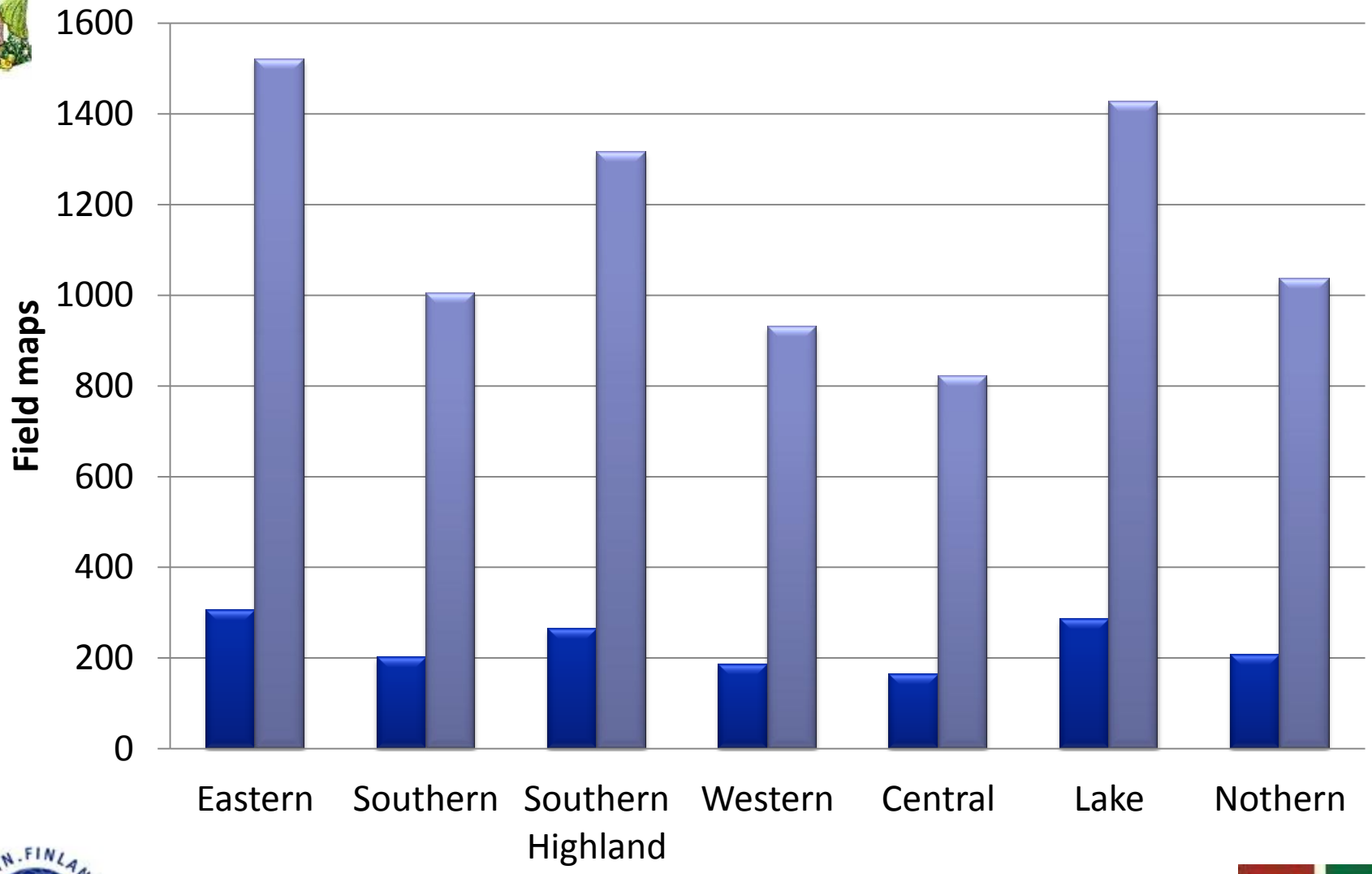
FIELD MAPS PRODUCTION FROM TOPO SHEETS & GOOGLE EARTH



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FIELD MAPS PRODUCTION FROM GOOGLE EARTH

Zone	Maps per zone	Total copies
Eastern	0	0
Southern	0	0
Southern Highland	0	0
Western	18	90
Central	29	145
Lake	5	25
Nothern	1	5
Total field maps	**53**	**265**

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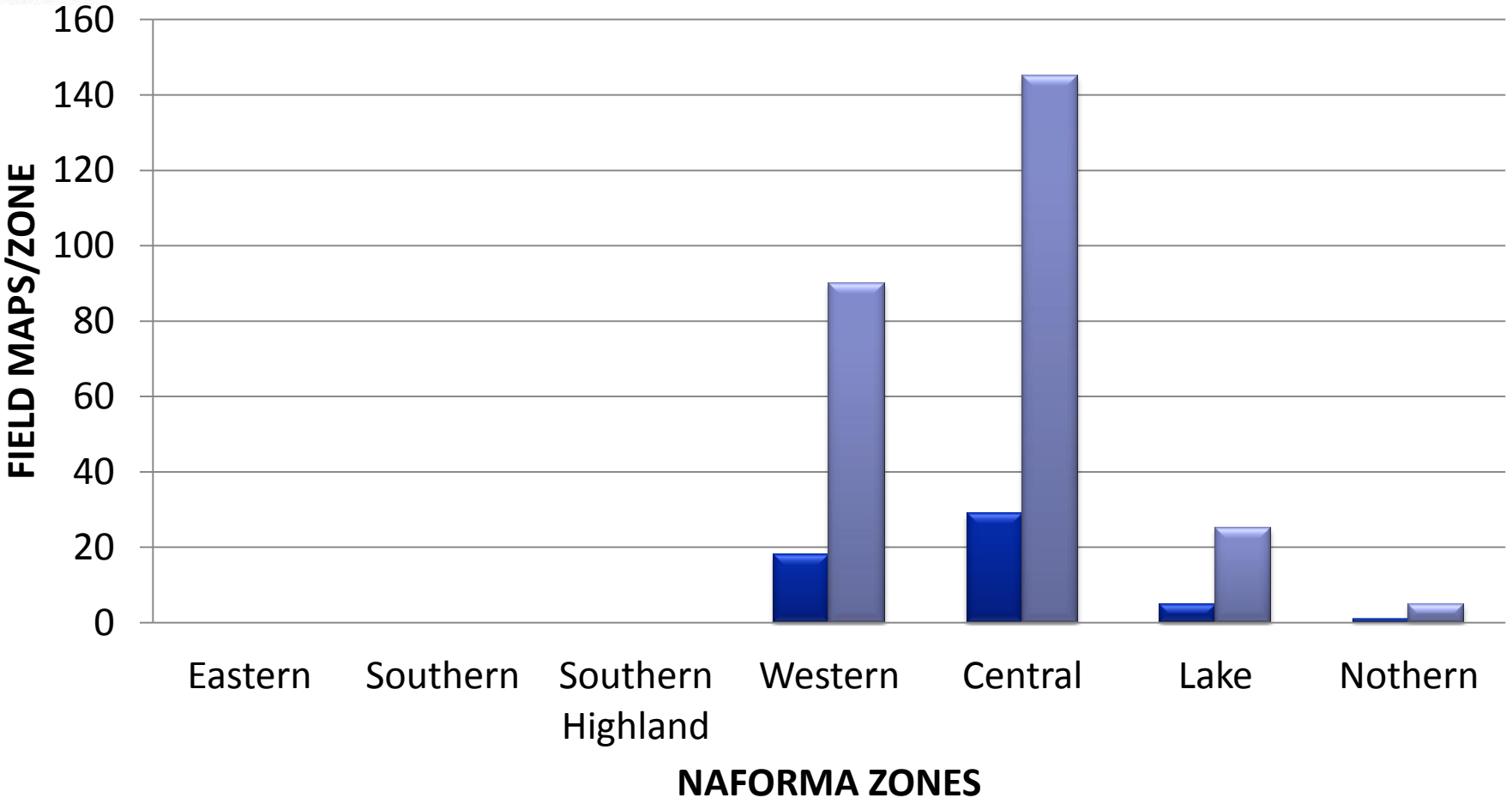
MAPS TO BE PRINTED BY GOOGLE EARTH



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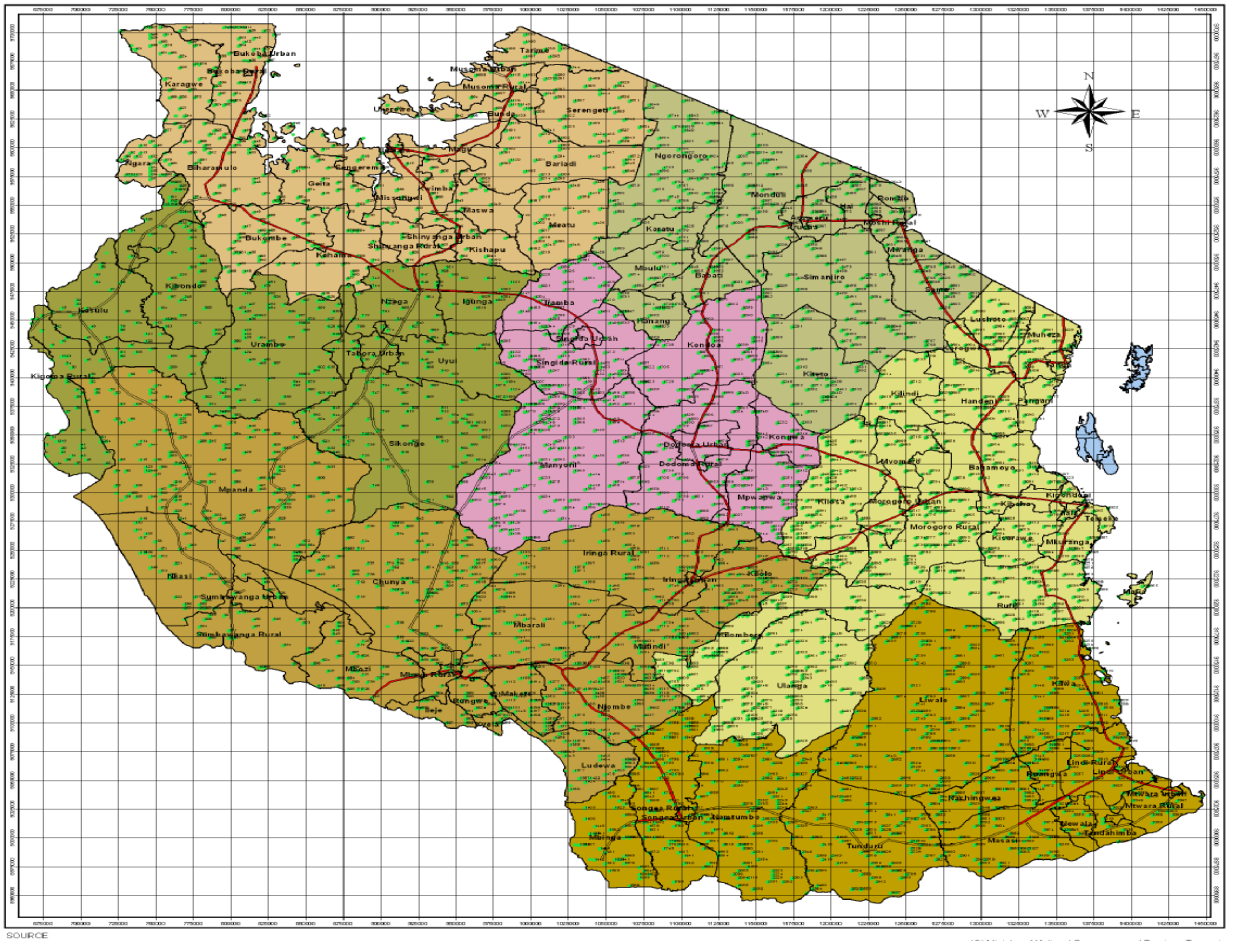
MINISTRY OF NATURAL RESOURCES AND TOURISM OF THE UNITED REPUBLIC OF TANZANIA

SAMPLE CLUSTER INDEX MAP



SOURCE
Map compiled from the ward map of the International Livestock Research Institute and National Census Bureau of Tanzania (2006)
Cluster sample location prepared by NAFORMA project

100 0 100 200 Kilometers

(C) Ministry of Natural Resources and Tourism, Tanzania.
Forest and Beekeeping Division
NAFORMA Project (February 2010)

LEGEND

- Central
- Coastal/Eastern
- Islands
- Lake Victoria
- Northern
- Southern
- Southern Highlands
- Western
- District Boundary
- Main road-Tarmack
- Main Road-Loose
- 382 Biophysical sample cluster

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Field plots Index map

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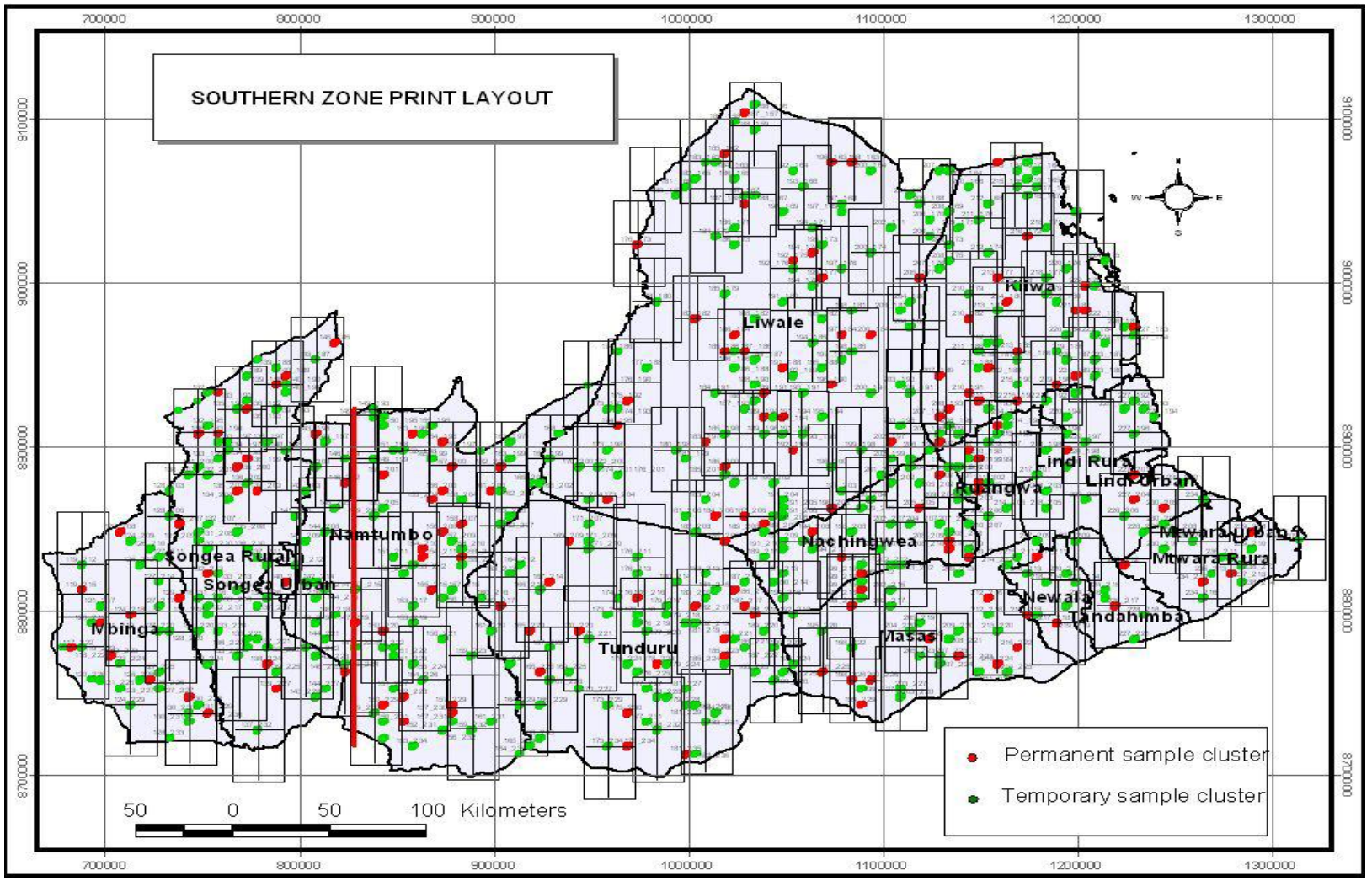

Printing plan layout map

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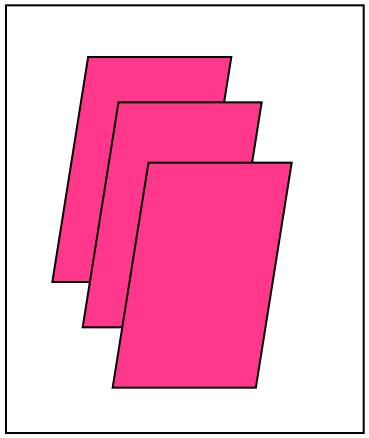
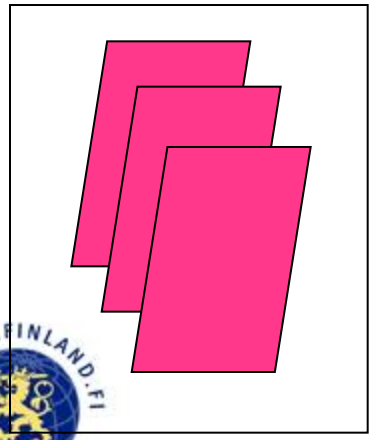
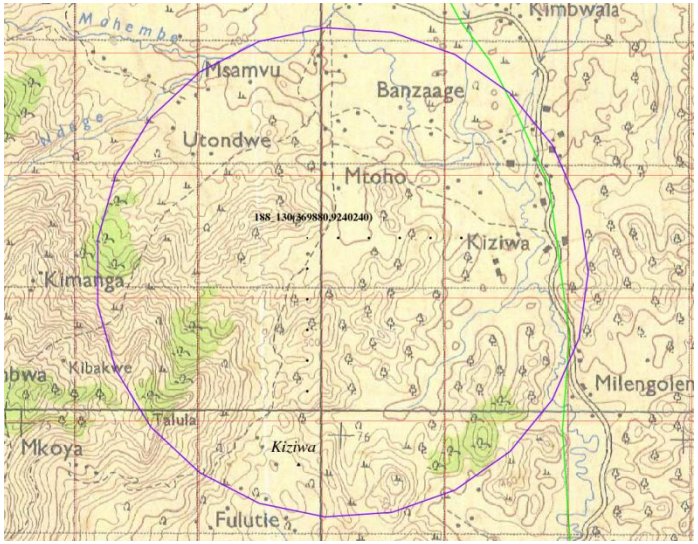
...and run

Raster Data



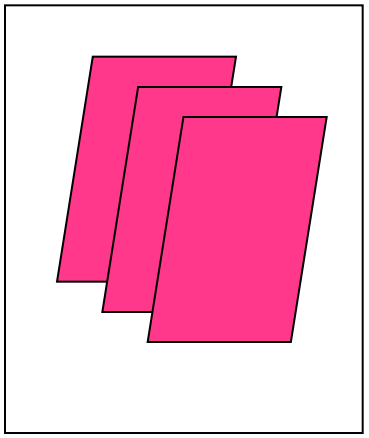
Vector Data





More than 3000 A1 Size maps to be autonomously plotted

Plot locations



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IMPLEMENTATION

- Open source tools (Grass GIS, ogr2ogr, cs2cs, awk etc.)
- bash programming language (700 lines of code)
- Can be used from Grass command line or in batch mode
- Easy to modify for other countries' purposes

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FUNCTIONALITY

- Ask user for the cluster ID and map label
- Find field cluster coordinates
- Compute bounding box
- Compose map background from scanned toposheets (raster)
- Add vector layers
- Add plot locations and compute SE study area
- Add other components (Header, Footer, map label)
- Print to an eps file
- Convert to ready-to-print pdf format
- Clean temporary files

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USAGE

pekkarinen@fod291: /media/DATA/Naforma/Tanzania/Grass

File Edit View Terminal Help

```
Welcome to GRASS 6.4.1 (2011)
GRASS homepage:                          http://grass.osgeo.org/
This version running thru:               Bash Shell (/bin/bash)
Help is available with the command:      g.manual -i
See the licence terms with:              g.version -c
If required, restart the GUI with:       g.gui tcltk
When ready to quit enter:                exit

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

GRASS 6.4.1 (Tanzania-35):/media/DATA/Naforma/Tanzania/Grass > bash NEW-NAFORMA-WMAP-A1.sh
usage sh NAFORMA-WMAP-A1.sh <xcluster> <ycluster> [map number]
where:
xcluster = CLUSTER X coord (7-244)
ycluster = CLUSTER Y coord (1-235)
GRASS 6.4.1 (Tanzania-35):/media/DATA/Naforma/Tanzania/Grass >
```

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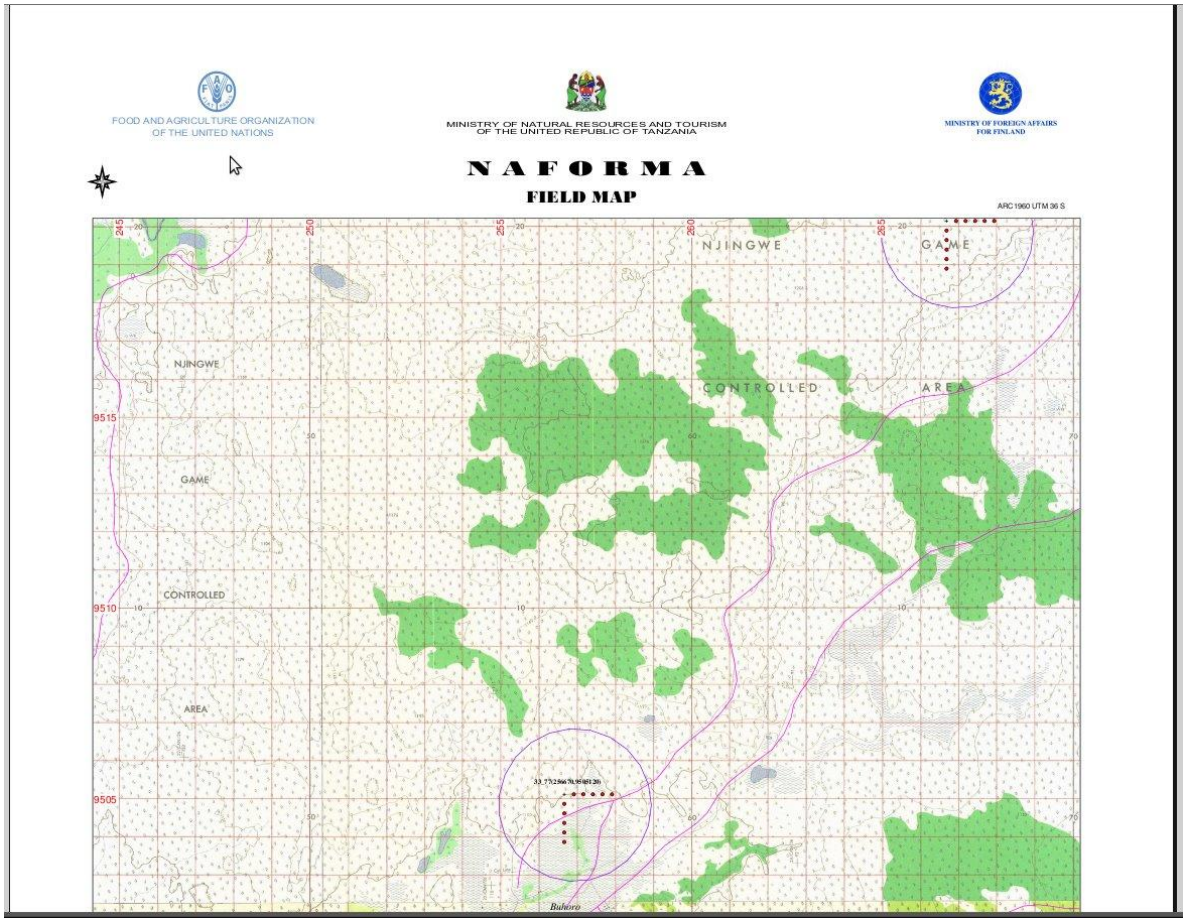

Field map for biophysical and socio-economic sampling location

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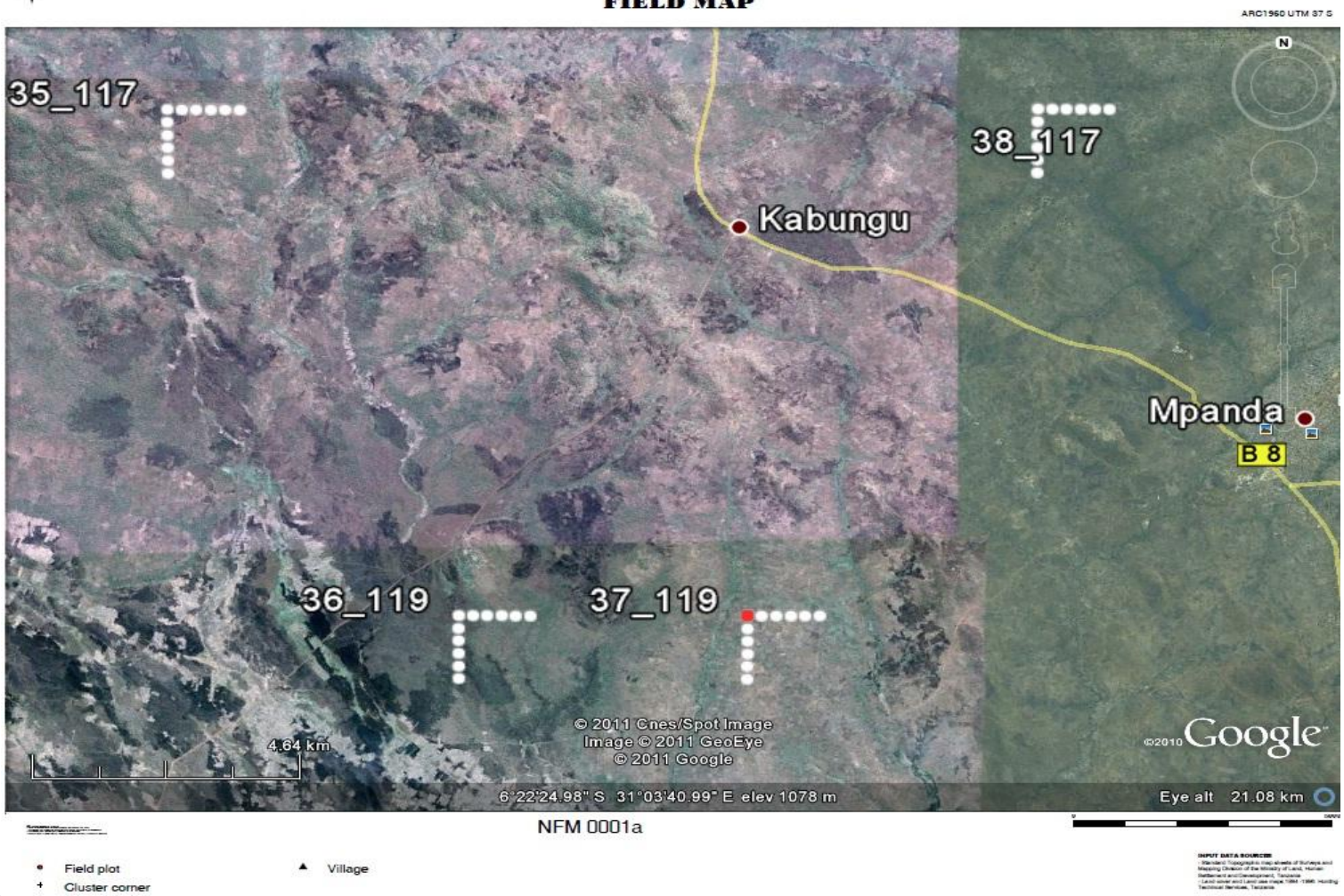
FIELD MAP



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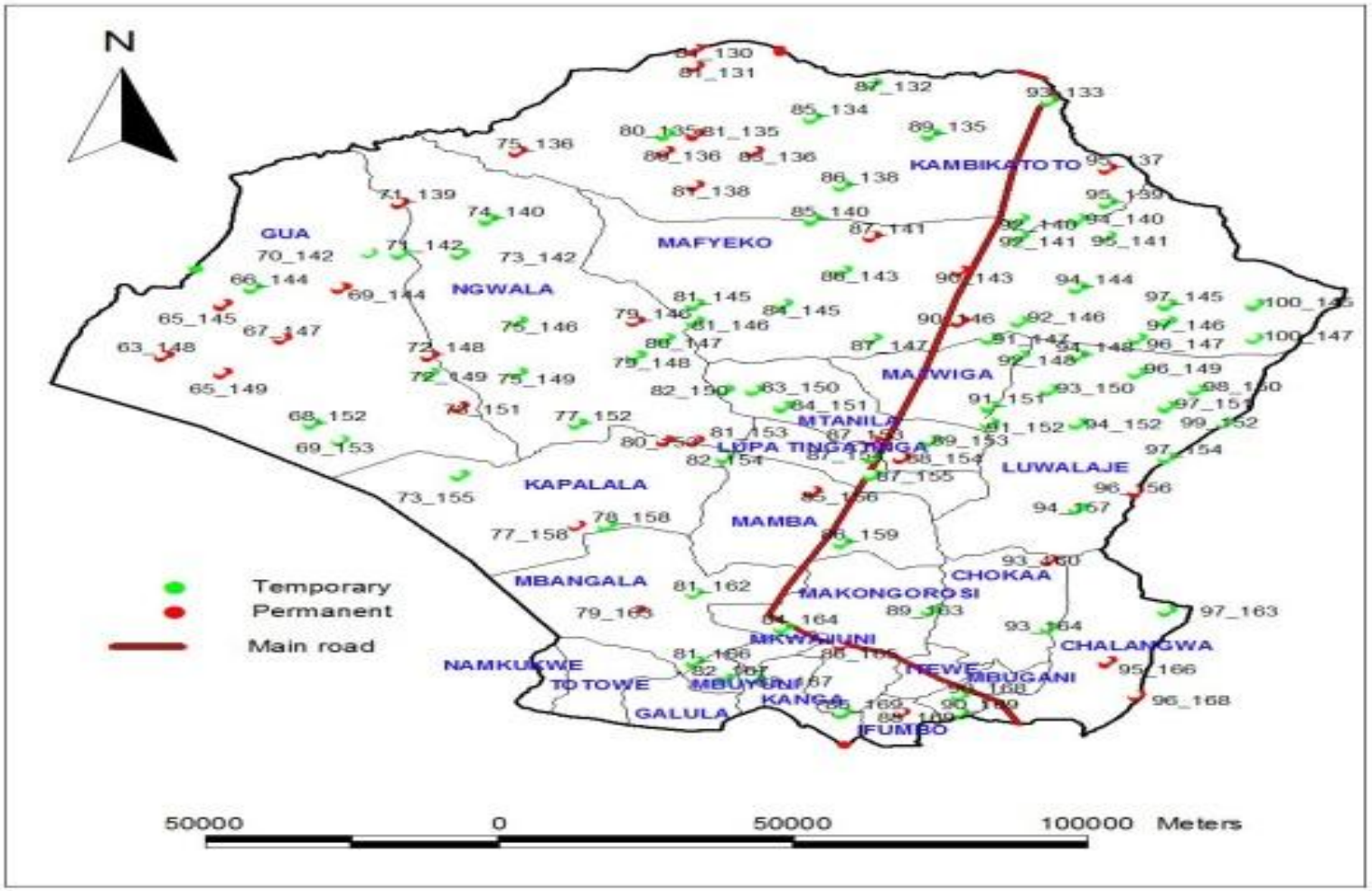
Field map for biophysical and socio-economic sampling location (From Google Earth)

CHUNYA CLUSTERS



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Field planning, Ward-District plot map

CHALLENGES IN MAPPING

- Unstable electricity
- Frequent Printer breakdown (iPF 170 canon);
- Lack of topographic sheet in some parts of NAFORMA zones
- Old age of topograhic sheets (1972,1982 &1986)
- Multi-tasking of the mapping crew: NAFORMA and FBD tasks
- Poor internet connection, hinder access of Google Earth

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COPING WITH CHALLENGES

- New generator has been purchased through UN-REDD to solve the problem of electricity
- Each member in mapping TWG has been assigned a specific task to acomplish in an agreed time
- Alternative use of printers: However; this produce A3 instead of A1

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COPING WITH CHALLENGES Cont..

- Use of modems in coping with the problem of internet

- Google Earth HR images were used for the parts which lack topographic sheets

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NAFORMA MAPPING TEAM AT WORK!!!

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Thanks for your attention

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