

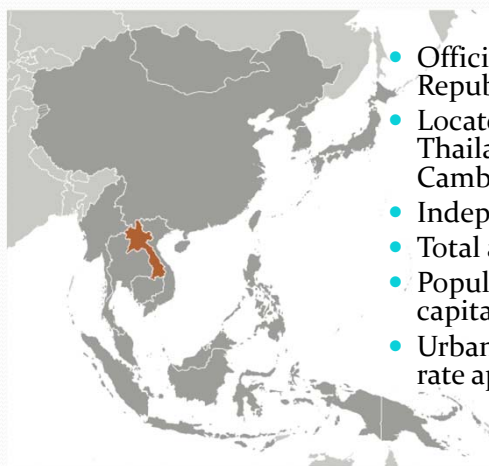
STRENGTHENING NATIONAL GEOGRAPHIC SERVICES IN LAO PDR

TECHNICAL CO-OPERATION
BETWEEN
REPUBLIC OF FINLAND
AND
LAO PDR

Kari Suominen

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LAOS AT GLANCE



- Official name : Lao People's Democratic Republic
- Located in South East Asia, neighbouring: Thailand, Myanmar, China, Vietnam and Cambodia
- Independence in 1954 (from France)
- Total area: 236,800 km²
- Population: 6.5 million people GDP per capita: 2,300 USD (179 in the World)
- Urban population: 33% (annual growth rate approx. 5%)

PROGRAMME



- Bilateral Development Co-operation Programme
- Continues Finnish Government support for Laos and other Mekong region, specially focused on land sector
- Approach is Institutional Development and Capacity Building
- Duration of the programme phase is 4 years, from August 2010 to July 2014
- Mapping area for this phase covers southern part of the Lao PDR covering 1/3 of the country.

PROGRAMME COMPONENTS

- **Component 1. Service Policy Development in the National Geographic Department**
 - ***Sub-Component 1.1 Long Term Strategy and Mid Term Development Plan of the National Geographic Department***
 - Summary of acute stakeholder interests and needs for maps and geographic data
 - Defining the objectives and implementation for updating the maps and geographic data by NGD
 - Defining any necessary new products and services for NGD
 - Drafting a service and data sharing policy for NGD. Stakeholder seminar for NGD development and geographic data needs

PROGRAMME COMPONENTS

- ***Sub-Component 1.2. Locating clients and providing them with access to geographic data in Lao PDR***
 - Review of the type and coverage of required potential NGD data needed by different organisations
 - Review of sources, types, coverage and transparency of geographic data procured outside NGD or produced by itself
 - Strong focus on public awareness raising on NGD and its products and services
 - Establishment of internet geospatial data portal
 - Additionally a separate and specific review and fact finding of NLMA, land titling, land use planning coordination and transparency needs is prepared.

PROGRAMME COMPONENTS

- **Component 2. Technical Capacity Building of the National Geographic Department**
 - Procurement of necessary equipment, software and materials
 - Repairs and maintenance of existing equipment, software and IT
 - Establishment of a modern digital orthophoto production and digital mapping line
 - Provision of a digital small-format aerial photography equipment and processing software
 - Training course for small-format aerial imaging and data processing
 - On the job training for the use of all new software and hardware
 - On the job training on geodesy, surveying, mapping, GIS and IT

PROGRAMME COMPONENTS

- **Component 3. Aerial Photography, Survey and Production of Orthophoto and Topographic Maps and Satellite Image and establishing a NSDI**
 - ***Sub-component 3.1: Densification of geodetic ground control network***
 - Review of the existing geodetic network
 - Review of the existing datum
 - Densification of the 1st order horizontal and vertical geodetic network all over the country
 - Review and improvement of transformation parameters between various data sets

PROGRAMME COMPONENTS

- ***Sub-Component 3.2: Production of digital orthophoto maps and digital/printed 1:50,000 topographical maps***
 - Carrying out digital colour aerial photography in the project area with 0.5 m nominal ground resolution with DGPS and IMU
 - Aerial triangulation
 - Digital elevation model (DEM) generation
 - Digital orthophoto map production
 - 2D-digitizing, DTM editing and contouring for 1:50,000 mapping
 - Defining of sheet index, and legend for individual topographic map sheets
 - Field verification and completion including place names and administrative boundaries
 - Printing of topographic maps at the scale of 1:50,000

PROGRAMME COMPONENTS

- ***Sub-Component 3.3: Updating and preparation of selected urban and suburban digital topographic maps at scale 1:5 000***
 - Updating of existing 1:5000 scale digital topographic maps on Pakse, Savannakhet and Thakhek based on the fresh digital photography
 - Digital colour aerial photography carried out by NGD for selected urban and suburban areas with the delivered small format equipment
 - Aerial triangulation for the areas photographed above by NGD
 - Field verification and completion including place names
 - Digital map editing

PROGRAMME COMPONENTS

- ***Sub-Component 3.4: Satellite ortho-image mosaic over Laos (subject to need)***
 - Delivery of the existing satellite imagery from all different organisations in Laos to NGD
 - Delivery of the existing digital elevation model (DEM, 50x50 m) to NGD
 - Procurement of additional and up-to date satellite imagery to fill the possible gaps in the coverage of the existing imagery
 - Densification of GPS ground control network for geo-referencing of the images.
 - Ortho-rectification of the images to WGS84 and Lao coordinate system
 - Radiometric correction of images is needed to get seamless colour balanced mosaics of the images.

PROGRAMME COMPONENTS

- ***Sub-Component 3.5: IT/GIS/Computer Network and Database Management established for NSDI***
 - NGD's computer network and database management
 - Planning and implementation of backups for the old and new digital data
 - Planning and implementation the delivery of digital materials to the clients
 - Advising in development of Internet services in NGD
 - Analysis and solutions to mapping and National Spatial Data Infrastructure (NSDI) database entry (including aerial photography)
 - Advancing administrative coordination in IT/GIS/Metadata in order to introduce NSDI

TECHNICAL ADVISORY

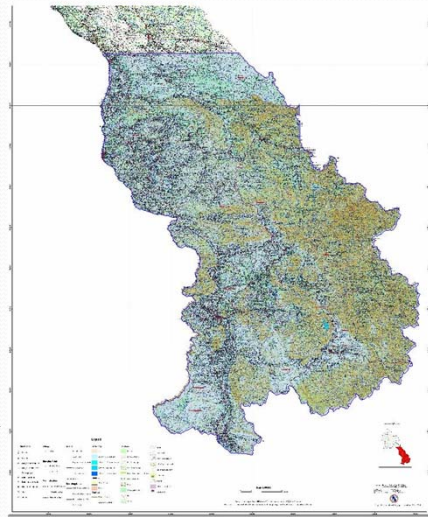
- **Long Term Advisors**
 - CTA / Geodetic Advisor
 - Photogrammetric Advisor
 - Cartographic Advisor
 - Surveying Advisor
 - GIS Advisor
- **Associate Advisors**
 - ICT Advisor
 - WEB-GIS Advisor
- **Short Term Advisors**
 - Strategic Planning
 - Marketing, Public Awareness and Media
 - Offset Map Printing
 - Stereo Restitution
 - Legal Advisor
 - Aerial photography



AERIAL PHOTOGRAPHY

- **PROJECT AREA**

- Southern part of Laos
- Savannakhet, Saravan, Champasak, Xekong, Attapu and southern part of the Khammouan province
- Approx. 71,000 km² (1/3 of the country)
- Photography completed between November 2010 and January 2011



AERIAL PHOTOGRAPHY

- **EQUIPMENT**

- VEXCEL UltraCam Xp large format digital camera
 - 17310 x 11310 pixels = 200 Megapixels
- Tracker GPS navigation system
- AEROCtrl GPS/IMU registration
- Piper Cheyenne II Turboprop





**THANK YOU
FOR YOUR
ATTENTION!**