STRENGTHENING NATIONAL GEOGRAPHIC SERVICES IN LAO PDR

TECHNICAL CO-OPERATION BETWEEN REPUBLIC OF FINLAND AND LAO PDR

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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.

- **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

• **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

- Short Term Advisors
  - Strategic Planning
  - Marketing, Public Awareness and Media
  - Offset Map Printing
  - Stereo Restitution
  - Legal Advisor
  - Aerial photography

- Associate Advisors
  - ICT Advisor
  - WEB-GIS Advisor
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
  - AEROControl GPS/IMU registration
  - Piper Cheyenne II Turboprop
THANK YOU FOR YOUR ATTENTION!