

SUCCESSFUL OF REMOTE SENSING AND GIS APPLICATION IN SUPPORTING OPIUM POPPY SURVEY AND ERADICATION IN THAILAND

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ABSTRACT

Narcotic Crop Survey and Monitoring Institute (NCSMI), Office of the Narcotics Control Board (ONCB) applied and integrated fundamental methodologies of narcotic crop aerial and ground survey with modern technologies of Remote Sensing techniques such as satellite imageries in supporting opium poppy field interpretation, GPS data acquisition in coordinates of opium field and also flight route which be easier to make more accurate and punctual positions of opium poppy fields. All data will be imported and analyzed in GIS software to produce thematic maps of opium poppy fields. All data will be imported and all descriptive data concerned. All of them will be transferred to eradication units like the Third Army Area-RTA, the Border Patrol Police Region 3 and also the Provincial/District Operation Centers for Combating Drugs to reach target areas and eradicate opium poppy fields before harvesting by farmers. According to the successful of these applications make high benefits of opium poppy cultivation areas decreased from 8,777 hectares in 1984 to 208 hectares in 2011 and the United States has withdrawn the name of Thailand from opium poppy name list countries since 2004. These Thai's Remote Sensing and GIS application also be benefit to other countries where opium poppy or other narcotic crop situation still being the serious problems.

1. OPIUM POPPY CULTIVATION AND ERADICATION IN THAILAND

The unofficial of opium poppy cultivation survey in Thailand started in 1973 by the Department of Forestry and Department of Public Welfare which could not collect the number of opium poppy field at that time. There were estimated 20,000 hectares of opium poppy fields. In 1979, Office of the Narcotics Control Board (ONCB) assigned that the official opium poppy cultivation survey and monitoring operation was one of the important of ONCB missions which operated by the Cooperating and Verifying Division (later was under the Narcotic Crops Control Division, Northern Narcotics Control Office, until now is the Narcotic Crops Survey and Monitoring Institute or NCSMI).

The opium poppy cultivation survey was covered the northern and northeast part of Thailand by using modern tools and equipments (at that moment) such as magnetic compasses, topographic maps, binoculars. Fortunately, the Narcotic Crops Unit (NCU) of the United States Embassy in Thailand which became aware of the problems and effects of the opium poppy cultivation in Thailand, supported the technology of aerial photo for the mission of the opium poppy cultivation aerial survey such as aerial photos, the lightening table for aerial photo interpretation, and airplanes for aerial photo operation which were very expensive. By these supports, the opium poppy cultivation

both ground and survey methodologies could sum up that there were 8,776.64 hectares of opium cultivation areas cover the northern and the northeastern part of Thailand in 1984 and also defined that there were 76 potential areas where were suitable for opium poppy cultivations (76 highland units) till present. In addition, by the study of the suitable location for opium poppy cultivation in Thailand were : cultivated by 800 meters from sea level, cool climate with highly humid and also highly rich soil.

Due to the first era of the opium poppy cultivation survey, there were many obstacles and problems in ground and aerial surveys. First, staffs were lack of experience in using many high technologies of tools and equipments especially an aerial photo recording and interpreting. In addition, staffs must practice in observation and remembering of opium cultivation, areas characteristics, hilltribe villages and also the flight path for preparing and managing in geographic database. Furthermore, this mission was the most risk for life and state properties.

The opium eradication started in the same period by the corporation of the Royal Thai Army, the Royal Thai Border Petrol Police. In this same period, many highland development projects came to join the mission by developing and promoting the crop replacement and the quality of life to all hilltribe people. With all good corporations from many bureaus and the efficiency of opium cultivation survey by ONCB, problems of opium cultivation were solved and made their lives be better.

2. Procedure of Opium Poppy Cultivation Survey

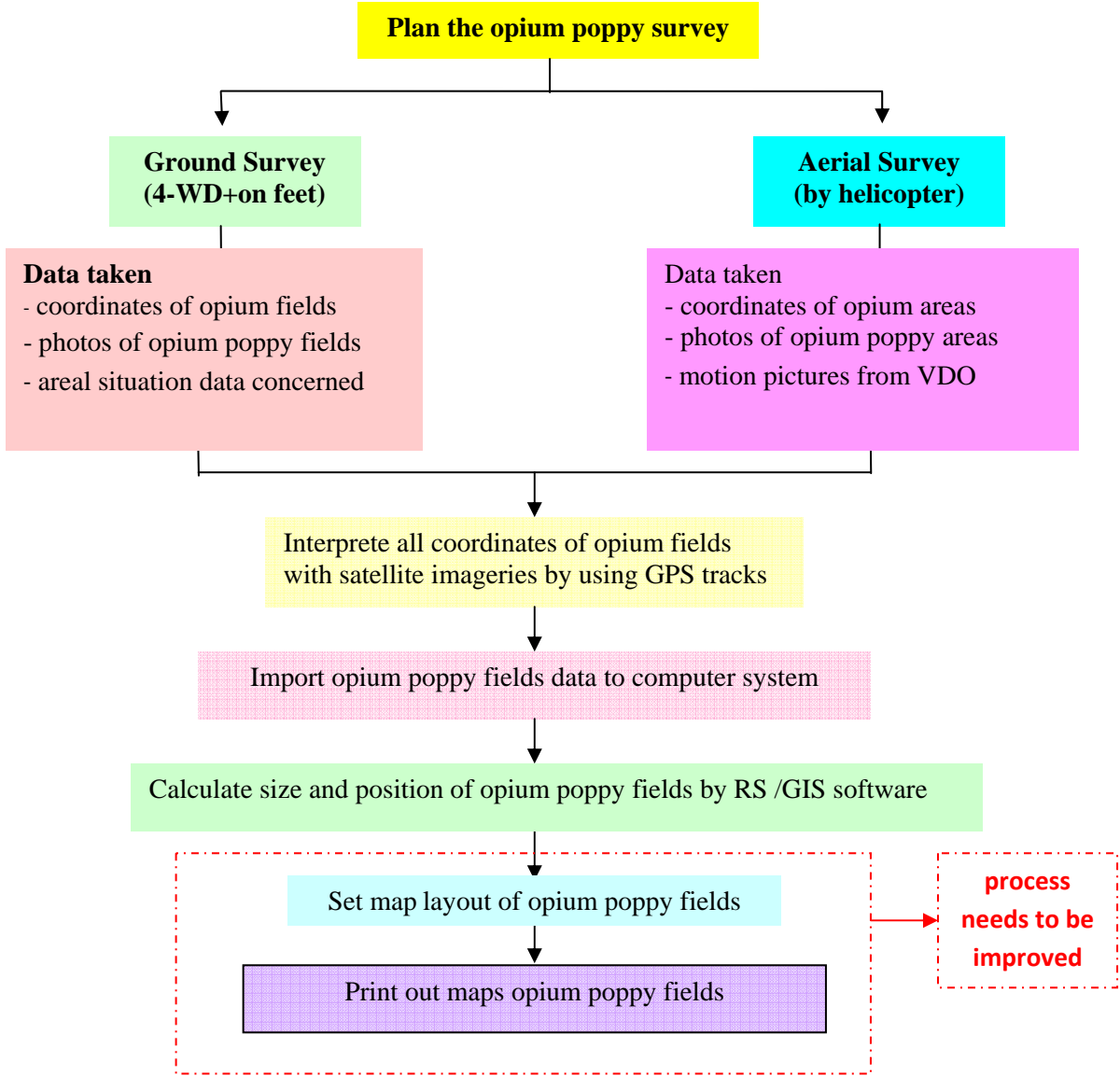


Figure 1: Work Flow of Opium Poppy Survey

3. Procedure which improved to make more efficient Opium Poppy Cultivation Survey and Eradication

During opium poppy data collecting in both ground and aerial survey, GPS tracks are used to overlay the topographic maps to lead surveyors and eradicators reach opium fields faster and more punctual position which help saving times and budgets.

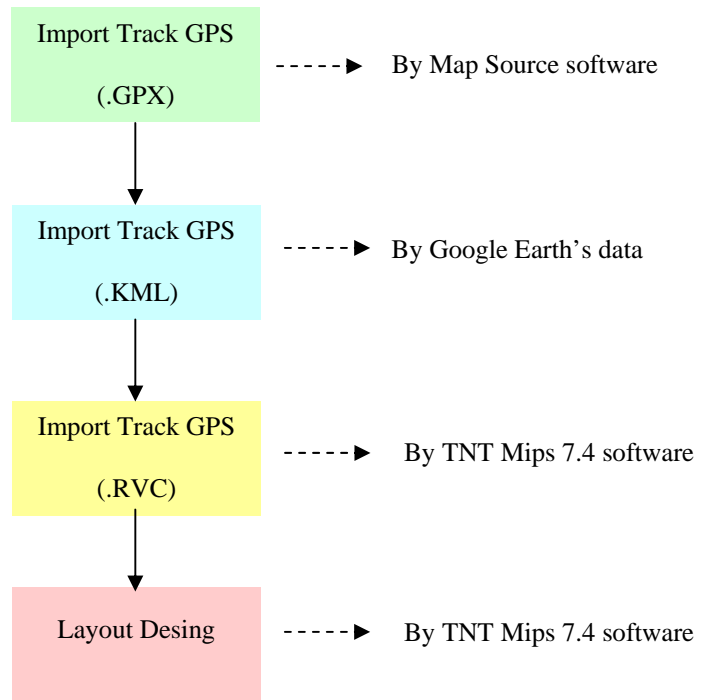


Figure 2: Work Flow of Import Track GPS

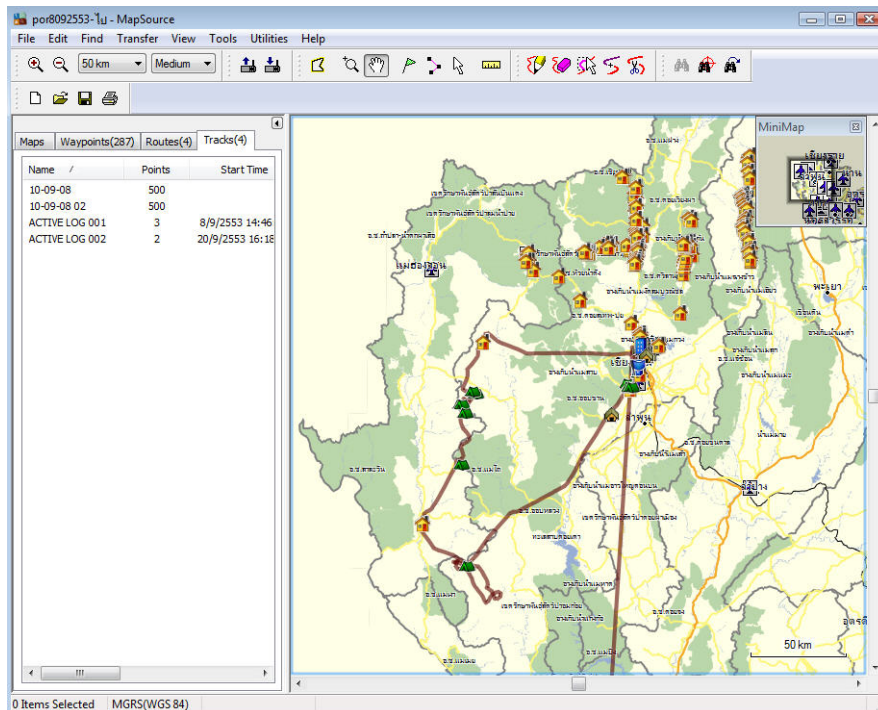


Figure 3: Import Track GPS by MapSource Program
Result(.gpx)

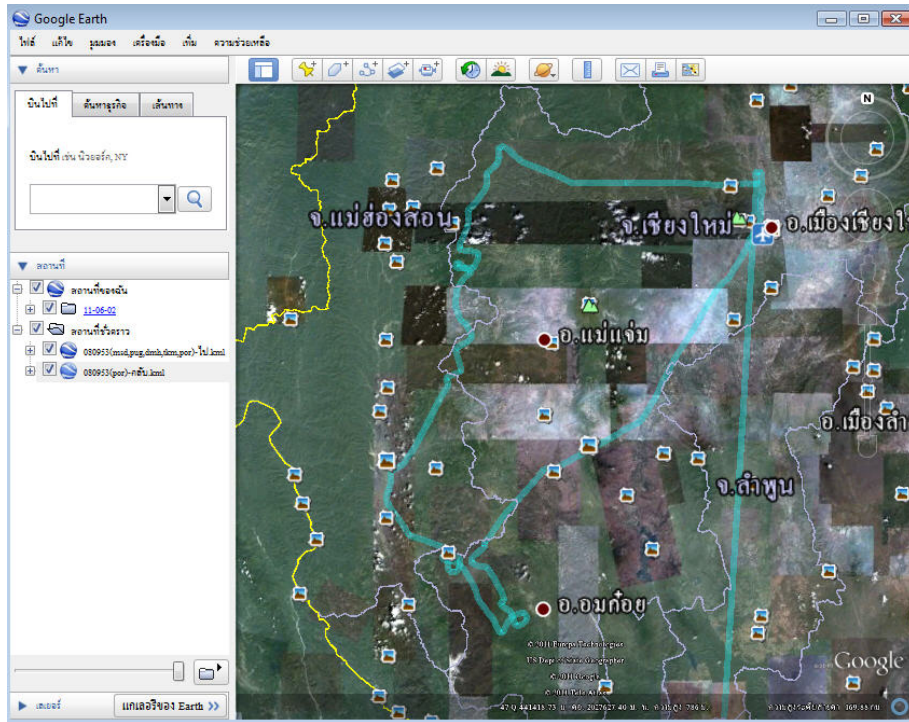


Figure 4: Import Track GPS (.gpx) by Google Earth Program Result(.kml)

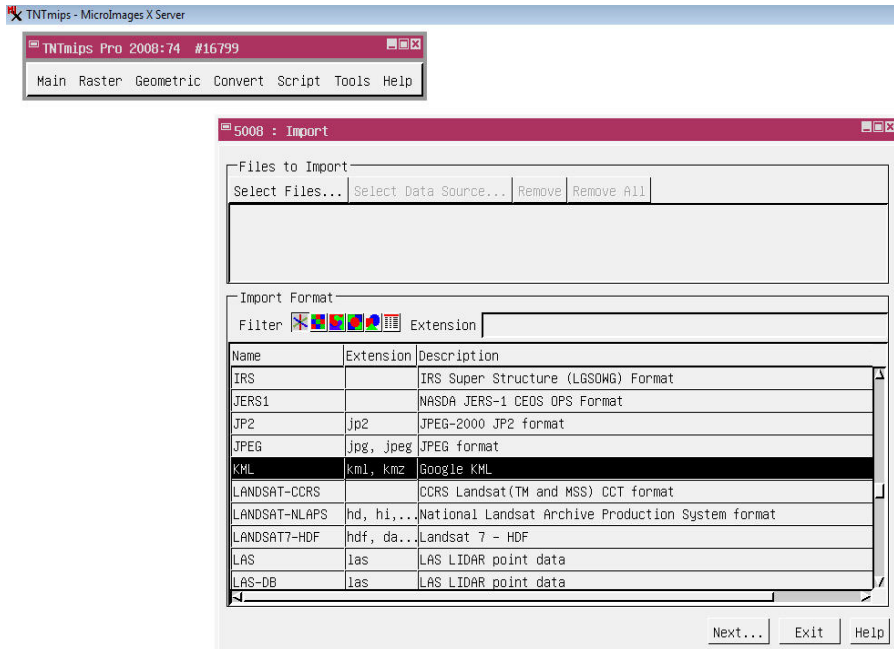


Figure 5: Import Track GPS (.kml) by TNTmips ver.7.4 Result(.rvc)

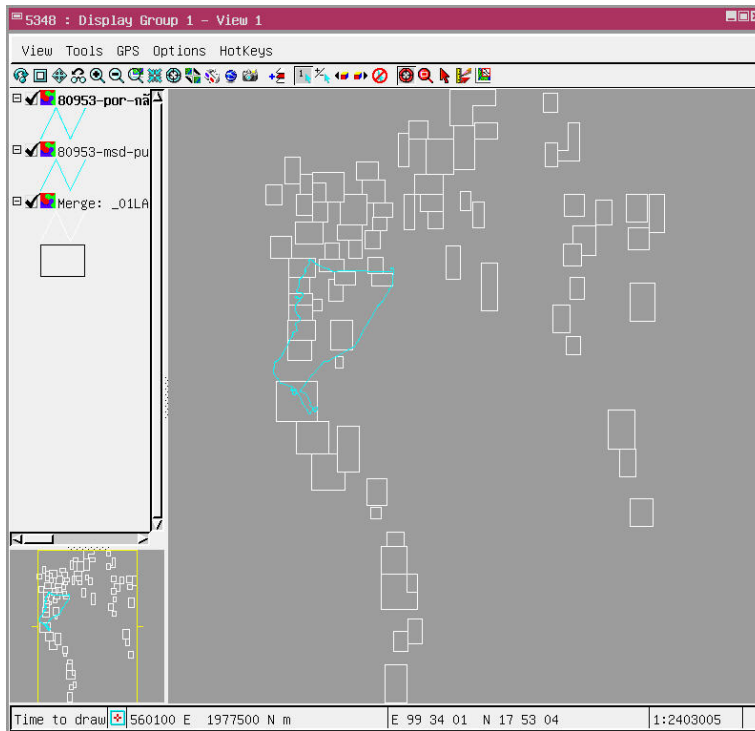


Figure 5: Result (.rvc)

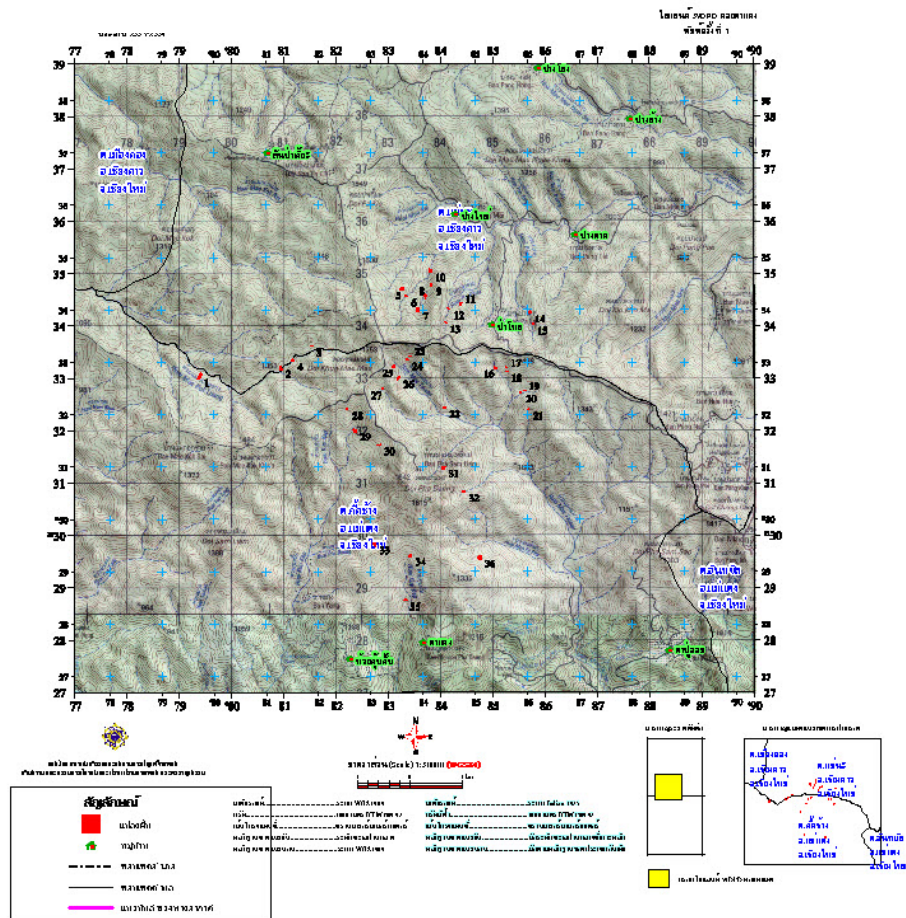


Figure 6: Old opium poppy eradication map (without GPS Tracks)

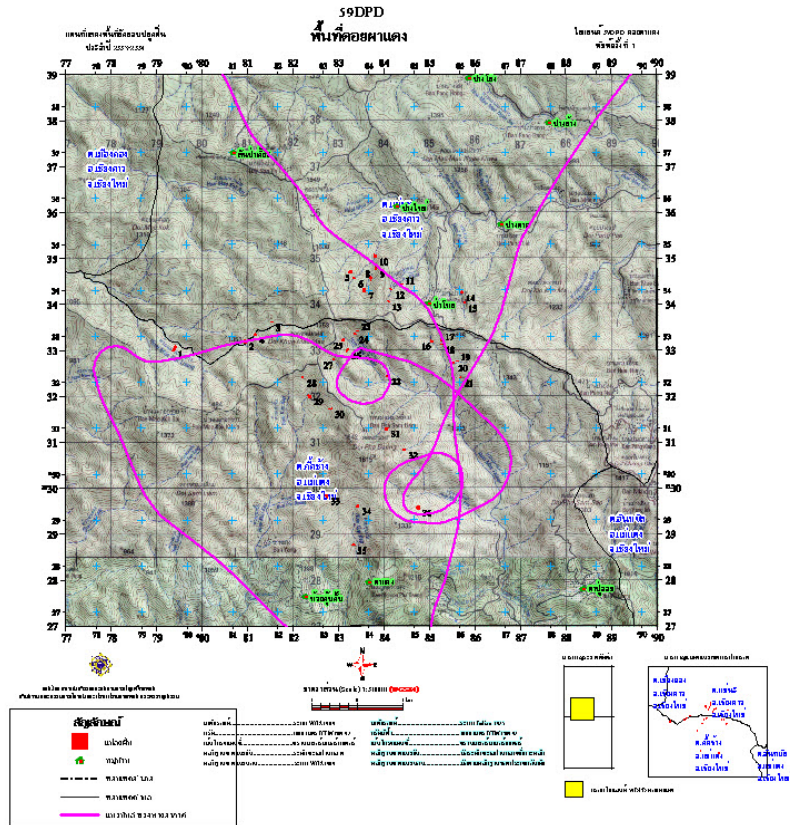


Figure 7: New opium poppy eradication map, improved by using GPS tracks

4. DVANTAGES

Application GIS data such as GPS tracks which taken from ground and aerial survey during the mission of opium poppy cultivation survey is very useful and make benefits to surveyors and also eradicators to easily reach opium fields with faster and get suitable economic budgets for troops in each trips they works. However, NCSMI will not stop and satisfy for this good methodology but also keeping on finding the more ways to develop opium poppy survey and apply to other narcotic crop survey.