

## INDONESIA EXPERIENCE IN GEOSPATIAL TRAINING

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**ABSTRACT:**

Training as non-formal education form is a very important step in long-live learning paradigm, also for geospatial. This paper described five highlighted Indonesia experiences in organizing of geospatial training, which in the past four years are carried out by National Coordinating Agency for Surveys and Mapping together with other partners. These trainings are training for Government Officer (TGO), Training for Teacher & Lecturer (TTL), Training for Children and Teens (TCT), Training for Student & Activist (TSA) and Training for Business Actors (TBA). Each training has different characteristics about their goals, prerequisites, curriculum, duration and financing.

### 1. INTRODUCTION

One of the duties and responsibilities of the National Coordinating Agency for Surveys and Mapping of Republic Indonesia (BAKOSURTANAL) is to promote geospatial technology in the country. This duty is implemented in form of several trainings, which is given to the people. In the past four years, some form of trainings is done, but five of them are found as the most favorable. There are: training for Government Officer (TGO), Training for Teacher & Lecturer (TTL), Training for Children and Teens (TCT), Training for Student & Activist (TSA) and Training for Business Actors (TBA). Each training has different characteristics about their goals, prerequisites, curriculum, duration and financing.

### 2. TRAINING FOR GOVERNMENT OFFICER

It is the most frequent training form – and also the oldest. Government Officer from several Provinces and Counties – sometime also from villages’ administration - come to the training. The venue is sometimes in BAKOSURTANAL Training Center near Jakarta, otherwise in hotel or other government buildings, sometimes also in the remote provinces. The organization and financing is sometimes BAKOSURTANAL responsibility but more often on the hand of other office or self-supporting. The ministry for internal affair and the province governments are few of big sponsors today.

The goal is mostly to give government officers the broader knowledge and know-how about geospatial benefit and technology. These could be: boundary demarcation (this training is really the most favor one since the regional autonomy policy!), green resources accounting, GIS for planning, GIS for e-Government, until toponymy and language-mapping. The duration of training is variously, from just two days until two months – depend on the demand and job-complexity-level of participating institutes.

Their own institutes mostly do the selection of participants – and this is sometimes not yet ideal. Not many of 33 Provinces and 440 counties (Kabupaten / Kota) in Indonesia have already special staff for geospatial data with enough geospatial education background (i.e. geodesy, geography, geology, civil engineering, planology, forestry, soil science, etc). In some cases, the trainee has background just in Law, Economics or Informatics.

In the past two years, BAKOSURTANAL has promoted a functional officer (aside of structural officer) in surveys and mapping. Ideally each county has at least five such functional officers. A training for surveys & mapping should be organized nationwide. Each training has maximum 20 participants. The duration of the basic training is two weeks, consisted of 82 training-hours. There are two level of basic training: Level A – Basic Training for non-academician, level C – Basic Training for academician. Training Level B (between A and C) is projected for transition of some experienced non-academician.

An example of the curriculum is in the fig. 1.

<i>Session</i>	<i>Level A - Course</i>	<i>Hour</i>
01	Basic Mathematics	8
02	Survey Instruments	8
03	Introduction to Mapping	10
04	Introduction to Thematic Mapping	8
05	Computer Drawing	12
06	Introduction to GIS	8
07	Introduction to Remote Sensing	8
U1	Professional Administration	4
U2	Professional Ethic & Motivation	4
U3	Health, Safety & Environment	4
U4	Ergonomy	4
U5	Business & Consumer Protection	4
<i>TOTAL</i>		82

Session	Level C - Course	Hour
01	Topographic Mapping	8
02	Thematic Map Application	4
03	Digital Mapping	10
04	GIS Application	10
05	Remote Sensing Application	10
06	Planning of Survey Project	8
07	Quality Management	8
08	Publication Technique	4
U1	Professional Administration	4
U2	Professional Ethic & Motivation	4
U3	Health, Safety & Environment	4
U4	Ergonomy	4
U5	Business & Consumer Protection	4
	<b>TOTAL</b>	<b>82</b>

Fig.1. Materials in Training for Government Officer (Mapping Surveyor)

There are five “universal session” both in Level-A or C. These session should help every mapping-surveyors to help himself in “jungle of bureaucratic administration”, give them something for their character building, know well about how to work safety and comfortable and how to “sell” his skill.

The training (and also other training) is designed to be fun like motivation training (such as 7-habit-training, ESQ-training). For instance, in the beginning the trainee will speak loudly the training yells “Go-go-go, Get-get-get, Draw-draw-draw”.

After the basic training, a functional mapping surveyor can follow further specific training, i.e. Remote Sensing, GIS, Softcopy Photogrammetry, Boundary Demarcation or Digital Cartography with each duration of about two months.

### 3. TRAINING FOR TEACHER & LECTURER

The rapid technology development in geospatial world (terrestrial instruments, GPS, INS, photogrammetry, remote sensing, GIS, and now: Location Based Service System – LBS) made high demand for teachers and lecturers to continuously update their knowledge. There are a lot of request to BAKOSURTANAL to give such training. The request comes mostly from geography teacher of senior high school – but also from university lecture in civil engineering or forestry.

There is some time not easy to give adequate training materials for them, since the education background are very variously. In some school, geography teacher is often in the hand of teacher with background in linguistics or psychology. If we talk about GIS, then it means we must give them the elementary of informatics, mathematics and graphics. The second problem is that the number of interested teacher is so big, but the budget from the ministry for education is very limited – so the number of trainings and training-hours must be limited. The result, the training is normally only two days (16 hours), with participant more than 50 in a class (fig.2). An example of the curriculum of this training is in the fig. 3.



Fig.2. Situation in the teachers training

Session	Materials for Teacher & Lecturer	Hour
01	An overview of new geospatial technology and its benefit	2
02	Reading and understanding of paper map (with practice)	2
03	Reading and understanding of digital map (with practice)	2
04	Photogrammetry & Remote Sensing for non specialist (demonstration)	2
05	Data entry - from GPS to GIS (with practice)	2
06	A taste of GIS Application (with demonstration & practice)	4
07	Design of simple but impressive map with GIS (with practice)	2
	<b>TOTAL</b>	<b>16</b>

Fig.3. Materials in Training for Teacher & Lecturer

Some teachers or lecturers will not participate in the big class, and with their own cost, they follow a special class, sometime 7 persons, sometime just 2 persons, and it was happened: just 1 persons.

### 3. TRAINING FOR CHILDREN & TEENS

When someone has open their eye about the benefit of “geospatial literacy”, then sometimes they like to make their children or teens has geospatial vision earlier. But this training should be fun, with many games and role-play.

Currently, training for children & teens is not yet often organized, but its popularity is increased. One of popular TV-cartoon in Indonesia is “Dora Explorer”, told about a girl make adventure with some tools, including map. So reading, using and drawing map is a favor skill for children. The duration of this training is normally short, less than 4 hours. Each two year, BAKOSURTANAL organized national contest for map drawing and map using. The best map drawn by children will be sent to international contest held by ICA.

An example of the curriculum of this training is in the fig. 4.

<i>Session Materials for Children &amp; Teens</i>	<i>Hour</i>
01 Found your way with map - <i>Find your gold with an old map</i>	2
02 Let your friend find your home - <i>draw where is your castle</i>	2

Fig.4. Materials in Training for Children &amp; Teens

#### 4. TRAINING FOR STUDENT & ACTIVIST

Student and Activist (usually Environment Activist) is the most vocal member of the society. It will be good when their idealism is supported by good information – especially geospatial information. BAKOSURTANAL organized also some training for them. The training is designed so that in the short time they know how to start by themselves if they need to use or learn more geospatial data and technology. It is clear that some students are already from geospatial faculty and they like to hear more advanced topics, different to their class. But most of the participants of such training don't have any geospatial background, since more activists have their root in medicine, law, sociology or political science.

Several non governmental groups (NGO) trained by BAKOSURTANAL have used their knowledge for activities in Aceh, which in 2004 is hit by great tsunami. The other groups engaged for tropical forest protection, biodiversity, indigenous knowledge archiving, social work etc. So the training should be rather in how to use geospatial data to optimize their non profit oriented work.

The training is normally two days (max 16 hours) and arranged usually in Saturday & Sunday (often in an outdoor camp). The number of participant is variously between 10 and 40. An example of the curriculum of this training is in the fig. 5.

<i>Session Materials in Training for Students &amp; Activist</i>	<i>Hour</i>
01 Map as a communication tool	2
02 Reading and understanding of paper map (with practice in the field with traditional & conventional instrument and GPS)	4
03 Participative Mapping (with practice in making a simple base map and thematic map)	4
04 An overview of GIS & Remote Sensing, its benefit and limit	2
05 A taste of GIS Application (with demonstration & practice)	2
<b>TOTAL</b>	<b>16</b>

Fig.5. Materials in Training for Students &amp; Activist

In some cases, the participants use the evening time to complete their participative map with interview the village inhabitant. They can collect the names, boundary or discuss some actual phenomena of surrounding area which should be mapped. They learn also that a functional map could be inexpensive and feasible in short time.

#### 5. TRAINING FOR BUSINESS ACTORS

Business Actors is normally high reactive for the technology change, because it is strong related to their competitiveness in the market. But unfortunately, not all business actors have enough capital to follow various workshop or seminars internationally. BAKOSURTANAL make bridges between business actors and technology providers. Yearly, BAKOSURTANAL organize at least one big event such as Forum of Geoinformation & Mapping ("ForGeoMap") or Geomatics Research Forum ("GeoReForm"), in which various workshops and training is served at low cost – and some times free.

In this workshop, major vendors like ESRI, INTEGRAPH, INTERMAP or AUTODESK can give an overview of their new products. Member of national TC211-Working-Group gives a talk-show about new ISO 191xx to the audience. And senior geospatial researcher discuss interactively with the public about actual topic. The most interesting topics are how to gain high benefit in a business using geospatial information or technology. And we can say that this kind of training is very dynamic. The duration of the training itself is maximum one day, and often just 2-3 hours.

After the training, the organizer distributes a short quiz for the content of training just to measure the success-rate of training and the expected follow-up. Some participants show their interest to more intensive training on their cost.

#### CONCLUSION

Various geospatial training should be designed for several target audience with different needs, background and organizational limitation.

#### REFERENCES

- Bakosurtanal, 2005, Juknis Jabatan Surveyor Pemetaan  
 Bakosurtanal, 2006, GBPP & Modul Diklat Surta.  
 Flavelle, A. (2003): Community Mapping Handbook. A Guide to Making Your Own Maps of Communities & Traditional Lands. Jaringan Kerja Pemetaan Partisipatif.