EXPERIENCES ON THE EXECUTION OF REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM TRAINING COURSE IN THE NATIONAL AERONAUTICS AND SPACE INSTITUTE (LAPAN)

Mahdi Kartasasmita, Mohammad Natsir, Wiweka

ABSTRACT

Remote sensing is one of mapping methods and the geographical information system is an instrument that can generate information from some spatial and non-spatial data.
The office of the deputy chairman of LAPAN on remote sensing affair activities are research and public services. The public services can be realized as education and training.
The results are the spreading of information about LAPAN ability in remote sensing data acquisition include its processing.

INTRODUCTION

The National Aeronautics and Space (LAPAN) count for one of the Government non-departemental institute that provide functional and responsibility to the president of Inonesia. According to LAPAN's organizational structure the chairman of LAPAN has 4 deputies; Deputy chairman on Administration, deputy chairman on space technology affair, deputy chairman on space media and deputy chairman on remote sensing affair. In the structure under the deputy of remote sensing affair there are center of Remote Sensing Technological and the Remote Sensing Application center and installation.

The activities of remote sensing deputy chairman office have some special form and characteristics; that are research and operational. The range of the research spreads from the land to the sea and the environment, from acquisition to image processing research (ground segment). Beside the research activities there are also some activities on remote sensing operational; from data reception to added value information production. And the last but not least some activities on the commercial users service.

Some forms of users servicing activities among others are the value added data, and some bilateral cooperation in special training course on remote sensing. Some institutions had taken the benefit of the program are The Assessment and Development of Industry and Technology (BPPIT) of Department of Defense, The Assessment and Development of Technology Agency (BPPT), The Central Bureau of Statistics (BPS), Public Work Department, Local Government of North Sumatra, Local Government of East Nusatenggara and so forth. Usually, the research and training course contract are base on the cooperation experiences have been done for years.

Training course on remote sensing and geographical information system has been performed through some steps among others; preparations, execution and evaluation. The three steps contain experiences of LAPAN in the recent years on organizing some training course in which some institutions were involved discussed in this paper.

TRAINING COUSE PREPARATION

The first principle components that must be arrange before the execution of training course are trainers, training course materials and infrastructural thing. The criterion in trainer selecting depend on their daily jobs and competency of every person/researcher, depend on the educational data of engineers from bachelors to doctoral degree.

From some training courses periods we can see some course materials given in the course that are :

1. The National Aeronautics And Space Conceptions.
2. Remote Sensing Organizations And Their Activities.
3. The developments of remote sensing and technology and its application.
4. The advantages and constrains of remote sensing technology, the data acquisition vehicles and sensors characteristics, future remote sensing satellites and data formats.
5. Systematic corrections
6. Geometric corrections of image
7. Enhancement and data ingest
8. Classifications
9. Introduction on Radar technology
10. The application of remote sensing data for land, especially for agriculture
11. Evaluation of Agricultural land use consistency
12. The application of remote sensing data for marine, especially for fish ponds
13. The application of remote sensing data for environment
14. Introduction to Geographical Information System concept
15. Implementation of Geographical Information System
16. Theoretical and practical interpretation of satellite image
17. The introduction to Image Processing packet
18. Image Analysis practice
19. Case Study
20. Surveying Study
21. Position measurements practice
22. Field surveying
23. Yield revision, report writing and group seminar preparation
24. Report revision and global seminar preparation

Infrastructure for training course completion, number of hardware and software requirements, base on the number of training course participant. The hardware, use in the training course are PCs, digitizer and scanner. Software used in the training course are ER-Mapper, Arc View, Arc-Info. All hardware are owned by LAPAN itself and coordinated by Image Analysis Unit. For position field surveying according with area location, we use GPS-Navigation Magellan and Garmin. The Landsat-TM digital image requirement, provide by data processing technology operational team.

TRAINING COURSE EXECUTION

Training course process comprise of theoretical remote sensing and geographical information system, and computer practical work and field surveying. The training courses need 8 hours 30 minute effectively per day included pause and lunches time. Total time needed for theoretical materials is about 20 hours 20 minute, 34 hours 40 minute for practical work and 57 hours 30 minute for reporting.

The training course model for theory as student-lecturer relationship in the class. The communication interactively between the two parts can be perform cause a good transfer of knowledge. The aim of the training course; the participants would know the concept of remote sensing and be able to operate some digital processing facilities. Usually the participants are graduated from some various universities with different major (from exact to inexact division). So can be imagine how to transfer the training course materials that full of mathematics terms to the participants. They need some extra special effort in the studying process to accomplish the training course aims.

Training course model in practical works, the participants should be able to run some software packed like corrections, transformations, digital classification, and adding vector data into raster data, so can emerge some information that participants see and translate the meanings behind the given spatial and non spatial data.

Beside the processing works, the participants should be able to operate GPS receivers to know the positions and then also can make polygons in image classification process, because sample data can be insert into ER-Mapper for supervised classification.

The participants are also trained how to operate digitizers, to receive vector data from maps as secondary data that are used as auxiliary data to geographic information system.

TRAINING EVALUATION

Evaluation to the participants ability during the training course, would be performs three times, final test that comprise of written final test, written report and seminar.

The written final test are performs in the check points test and filling test. The test include 45 problems, if a participant choose right in the check point he will get +1, if he pick the wrong one he will get -1 point. And if the participant fills a right one in the filling problems he will get +5.

The form of the research report, similar to student's thesis, it will be divided into five chapters. Chapter I Introduction,

Chapter II Remote Sensing and Geographics Information System Theory, Chapter III Case Study in the training course theory, Chapter IV Analysis, and Chapter V The Conclusion.

In the seminar, the participants that are divided into some groups report their case study results after surveying and processing their study objects. The seminar, monitor by their trainers, eye witnessed by the others, and some special guesses.

The three components are the base of participant graduation. The evaluation is very important for the participants in the future, for instant, in BPPIT the best five from the final evaluation will be promote to the next higher education.

CONCLUSIONS

The chance in remote sensing and geographical Information system still wide open for either central governmental institution or private company and individual person. It is shown in many inquiry letters and interest of the participants in the developments of satellite data performance in some applications such as rice plant growth monitoring in Java, corral monitoring in entire Indonesia.

The scientific diversity of the participants corresponds with the materials should be normalize and standardized in the matriculation class before the training course begin. To make the various specialization become a synergy need some conditions to be examined and done before participate in the training.

The balance between theory and practical work in the training can make more successfully participation.

REFERENCES

--------- , 1999, Personal Communication to Steering Committee of Last RS Training Course LAPAN-BPPT 1998, Jakarta

Anonymous, 1993, *LAPAN Organization Structure*, Information and Documentation Center LAPAN, Jakarta

Anonymous, 1997, *Remote Sensing and Geographic Information System Training Course Text Book*, LAPAN-BPPIT, Jakarta

Kartasasmita, Mahdi, et. All, 1998, *Introduction to Remote Sensing Technology and Aplications & Geographic Information System*, The Office of The Deputy Chairman of LAPAN on Remote Sensing Affair, Jakarta