



Proceedings of 2nd DGPS training for the Bangladesh Forest Inventory

*Wildlife center, Gazipur
21-22 May, 2017*



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Executive summary

The Forest Department in association with FAO organized two-day training program on using Differential Global Positioning System (DGPS) for the forest department officials. The training was held on 21 and 22 May, 2017 at the Wildlife Centre, Gazipur. The training included theoretical session, practical exercises and Field works.

In total, nine participants (all male) attended the training. The participants were from the Forest Department, FAO and Overseas Marketing Company (OMC).

The objective of the training was to produce a protocol on using DGPS in the field for data collection and create a pool of expert in the forest department having knowledge of using DGPS. Main objectives behind formation and mobilizing of DGPS team in the field is to relocate and permanently establish the current Bangladesh forest Inventory (BFI) plot using this device as it gives more accurate geographic coordinates with centimetre level accuracy which is not possible in other hand-held Global Positioning System (GPS). Once the plot become permanent, they will help in future assessment. This DGPS team will help in present inventory as well as provide support in future. The participants were familiarised with DGPS equipment and other instruments used in the ongoing inventory and protocol followed. Besides, they learn how to relocate plot centre using different data from this training.

At the end of the training the participants showed high level of satisfaction and became confident of using this technology. The use of practical exercises was particularly appreciated, as well as the presentations and content of the course. During practical session participants recognised the need of ensuring data availability and development of protocol for using DGPS.



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1 INTRODUCTION

Field execution of Bangladesh forest inventory began in November 2016 with an aim to estimate forest resources, biomass measurement and to estimate the volume of wood available in the country. BFI is using latest technological advances in field of forest inventory. The entire country is divided into 5 different zones and 1858 plots have been selected by using pre-stratified systematic sampling.

For continuation of the inventory and establishment of BFI unit in Forest department it is important to establish permanent sample plots for future measurement. Handheld GPS is used to locate the plot in the field but during relocation of the same plot using this GPS shows distortion. On the other hand Differential Global Positioning System (DGPS) has centimeter level accuracy. The present inventory uses this high technology for making these plots permanent for future.

To relocate the present BFI plots and record the coordinates of those plots to fix as permanent sample plots a team has formed by Forest department. To develop capacity of the DGPS team members this training was organized by forest department with the technical help assistance from FAO and the financial support from USAID. Overseas Marketing Company (OMC) conducted the training. The training took place on 21-22th May, 2017 at Wildlife center Gazipur.

The training was attended by 4 forest department official and 3 FAO officials. This training was inaugurated and facilitated by Liam Costello, International Consultant of FAO. He explained the process of ongoing inventory work and defines the importance of using DGPS in this inventory. It is expected that the participants from the training will become the DGPS to implement the activities described.

2 OBJECTIVES

1. Build capacity related to field DGPS and post processing
2. To develop a pool of expert in the forest department of using DGPS in inventory related work.
3. Define the technical procedures required for DGPS field data collection and post processing of data
4. Identify needs of the DGPS team to implement the activities determined through training process
5. To expedite the ongoing inventory work by making the inventoried plot permanent through using DGPS.

3 ACTIVITIES

The duration of the training was 2 days. Every day was segmented into different sessions and the courses were designed in that manner (Appendix-2). Theoretical lessons were mainly focused on the starting day and the field work was derived at the end of the training.

3.1 1st Day of the training

Session -1

This training was divided into theoretical session, practical session and field session. Theoretical session was conducted by Mr. Sujon of OMC. At the beginning of the theoretical session he introduced the equipment and their uses with the team members. DGPS have two main units one is base and another is rover; each unit contains a receiver and a controller. Configuration of the controller and connect it with base and rover was described with practical demonstration. Every participant of the training followed the procedure and configured it individually after the demonstration. From this session, some requirements are cleared-

- We need to collect fixed points coordinates from Survey of Bangladesh (SOB) for our measurements.
- The zone information also should collect form SOB.
- These information are the pre-requisite for the DGPS measurements.

Session-2

Later in the practical session the team members prepare the equipment and collect data of certain point as experiment. After collecting data, they were stored in the controller for further processing and disassemble the DGPS. Each team members practiced separately to enhance expertise.

Session-3

In this session, the trainers show how to install data processing software, import data into it from the controller, process data and export collected data to computer and produce report using those data.

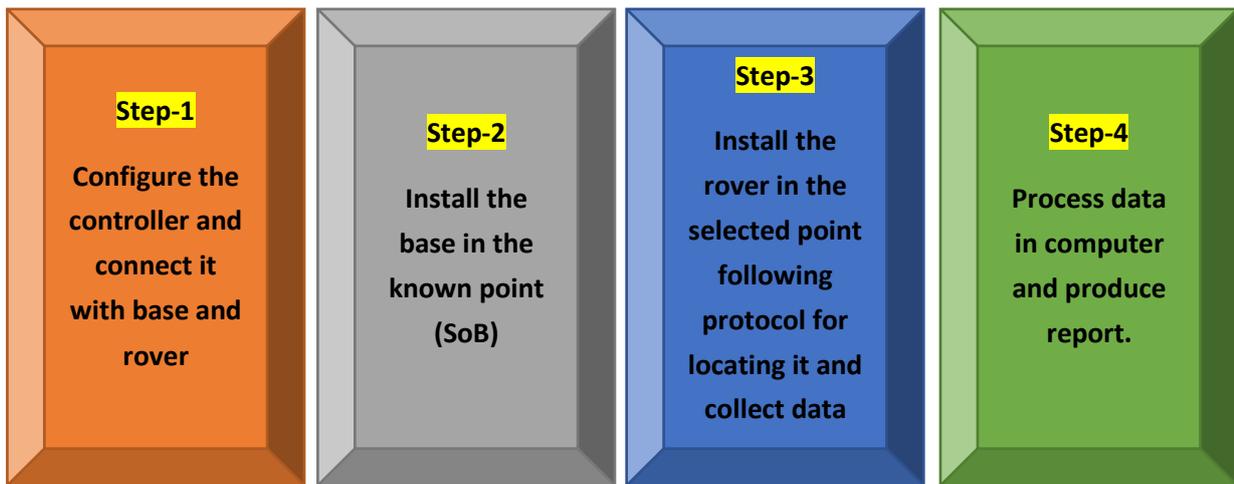


Fig1: Steps for DGPS use in the field





Fig 2: Training Session day_1

3.2 2nd Day of the training

Session -1

This session was conducted by Mondal Falgoonee Kumar of FAO. He explained about the present status of the inventory work and gave them an idea on plots distribution into five different zones. He briefly showed the equipment used for data collection in the field and gave them short introduction on using these devices. The work procedure of BFI field teams was also described shortly to make a clear conception regarding field work. It is also explained that how we can find out a plot center in the field using different attribute information from the collected data. For ensuring the accuracy of relocating plot center, four different steps were asked to follow.

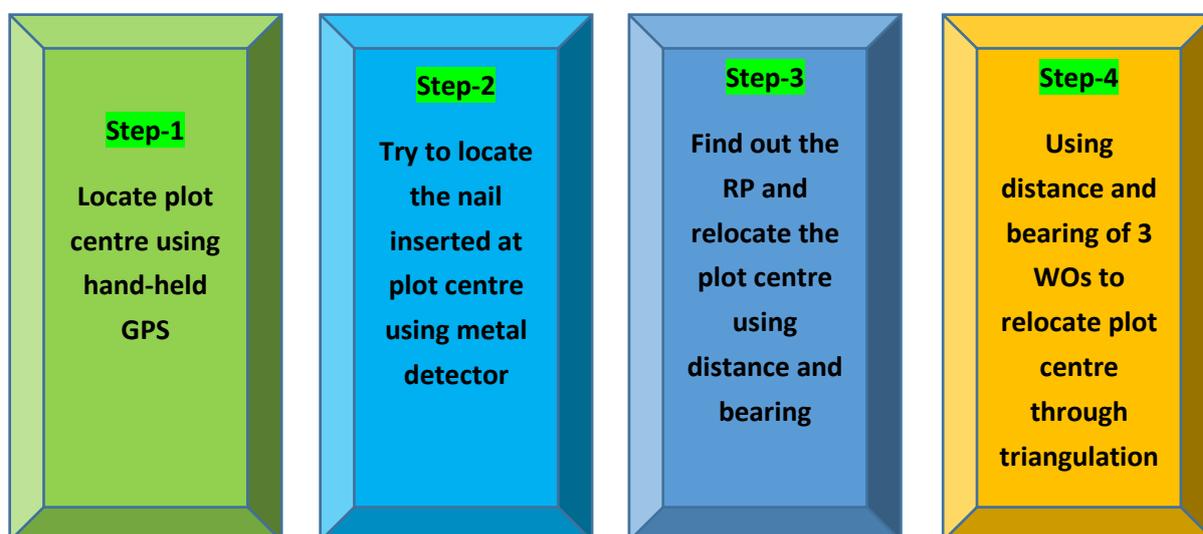


Fig 3: Steps for relocating plot centre.

Session-2

After getting in-house session on using DGPS and other equipment for relocating plot center, team was moved to identify a real BFI plot (NFI-365) in Bhawal National Park. At the beginning of the work, they inserted the base of DGPS in a known place of the national park near to some permanent structure. Then they make the device operational following training instructions. Later they took initiatives to find out the plot center using hand-held GPS. After reaching near to the plot center they used the metal detector to locate underground pin that is inserted at the center of each plot. The metal detector should be neutralized before using it, but unfortunately due to the lacking of necessary materials it was not possible to demonstrate the neutralization process of metal detector. Plot

center identification process was done by locating the Reference Point (RP) first using distance and bearing measurement described in the plot report. The exact location could then be confirmed using the distance from the Witness Objects (WO) through triangulation.

After locating the plot center using the three steps (Metal detector, RP checking and WO triangulation), team DGPS inserted the rover unit directly above the plot center pin and then started the process of data recording for that plot center. Controller device of the rover unit automatically shows the minimum time required for collecting accurate data. After approximately 15 minutes of data recording according to the device requirement, DGPS team has saved it in the device. Later the field team went back to office and processed the data in the computer using prescribed procedure and related software and produce report containing coordinate of that plot center and other relevant information.

All the team member become confident of using DGPS as they attend all the training session attentively, learn the use of different equipment used in the field for measurement, controller setup, base & rover installation and do everything in the field and in computer individually.



Fig 4: Training session day_2

4 RECOMMENDATION FOR NEXT STEPS

From the experience of DGPS training some recommendations are appeared to ensure proper field activities by the DGPS teams, as follows-

- Collect known point information and zone code from Survey of Bangladesh (SoB) as soon as possible, without this data DGPS will not work.
- Provide laptop to the field team for data processing and report generation.
- The DGPS team should re-measure the distance and bearing of RP and WOs for each plot.
- Provide a tab to send the collected data and record the measurements in the field.
- The DGPS teams will send the processed coordinates as well as unprocessed raw data for storage.
- An open foris form need to design for data entry of DGPS team.
- The DGPS team should start as early as possible to complete the task of located all plots before the end of the project.
- The metal detector should be neutralized for field work and this neutralization process should be demonstrated to the team.
- If the field team has to insert RFID chips then they need a demonstration of this process.

- Initiatives should be taken for demonstrating the procedure of inserting RFID chips before starting field work. Clear decision should be made to insert the RFID chips like where this will be inserted in RP or WO again sometimes the RPs and WOs are not trees they can be pillars, posts, buildings, road corners etc. so what will be then etc.
- List of equipment need to supply to the DPGS team (Appendix -1)
- Prepare plan for field execution of work. Team member should be engaged alternatively to avoid exhaustion and monotonousness.
- Steps for plot center establishment should be followed strictly.

5 CONCLUSION

Forest inventory is a continuous process and it should be done after certain interval to keep track of resources. It will help in taking management related issues. This training program was helpful to develop a pool of expertise in the forest department, who will lead the present inventory as well as contribute in future. Despite unfavorable weather condition, the participants expressed a lot of interest in learning as well as the experts also tried their best in teaching. Without any doubt, this team will do their job in the field with highest accuracy and help in successful implementation for the BFI.

Appendix 1. Equipment List

Equipment	Number
Receiver	2
Tripod	1
Pole	2
Carpenter tape	2
Marker	
Handheld GPS	1
Compass	1
Range finder	1
Bagpack (Water proof carrying system)	
Tab	1
Tent/Matt/polythine	1
Bush Cutter	2
Cronroller	2
Bipod	1
Bracket	2
30 m Tape	2
Metal ditector	1
Metal bars	
Sunto Clinometer	1
Reflector for Range finder	1
Laptop (with charger and others)	1
Pendrive	2
Plot Report	For each plot

Appendix 2. Agenda

Date	Session	Time	Resource Person
21/05/2017	Inauguration and objective of the training	10.00-10.30	Liam Costello
	Break	10.30-10.50	
	Introduction on DGPS, equipment uses and installation process	10.50-12.00	Nazmul Hasan Sujon
	Practical in the field	12.00-1.30	Nazmul Hasan Sujon/ Syed Nazmul Ahsan
	Break	1.30-2.30	
	Practical in the field and data processing	2.30-5.00	Nazmul Hasan Sujon/ Syed Nazmul Ahsan
22/05/2017	Introduction to BFI protocol, plot measuring equipment and steps for relocating plot center in the field	9.00-10.30	Mondal Falgoonee Kumar / Rajib Mahamud
	Break	10.30-11.00	
	Field Mission	11.00-2.00	Mondal Falgoonee Kumar / Rajib Mahamud
	Break	2.00-2.30	
	Data processing and report generation	2.30-3.00	Nazmul Hasan Sujon/ Syed Nazmul Ahsan

Appendix 3. List of Participants

Name	Gender	Organization	Designation
Md. Shahansha Nooshad	M	Forest Department	Forester
Md. Saiful Islam Dewan	M	Forest Department	Forester
Md. Mahabub Ferdous	M	Forest Department	Forest Guard
Md. Delowar Hossain	M	Forest Department	Forest Guard
Nazmul Hasan	M	Overseas Marketing Company	Senior Technical Executive
Syed Nazmul Ahsan	M	Overseas Marketing Company	Technical Executive
Liam Costello	M	FAO	Consultant
Rajib Mahamud	M	FAO	Consultant
Mondal Falgoonee Kumar	M	FAO	Consultant