

Abstract

A one day workshop on 'Biodiversity Awareness using Open Source Geospatial (FOSS4G) tools' was held at the lecture hall of the Centre for Continuing Education, Indian Institute of Science, Bangalore. The workshop was jointly organised by OSGeo-India, Hyderabad, APN, Indian Institute of Information Technology, Hyderabad, and the Energy & Wetlands Research Group, Centre for Ecological Sciences, IISc. The workshop gave the participants who came from a variety of backgrounds and geographical regions; an opportunity to learn from the leading experts in biodiversity and geospatial tools. The one day workshop ended with a lively interaction between the participants and an august panel. Each participant was given a certificate of attendance.

Introduction

Western Ghats, a global biodiversity hotspot, is facing a huge crisis due to the developmental demands. While this poses a biodiversity management challenge, localised studies and disparate datasets limit the ability to upscale studies/results to a level that can provide actionable inputs to decision makers and planners. Geospatial tools that can present data visually can be of great help to all the stakeholders for informed decision making. In this context, OSGeo-India, Hyderabad, APN, Indian Institute of Information Technology, Hyderabad, and the Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, jointly organised a one-day workshop on 'Biodiversity Awareness using Open Source Geospatial (FOSS4G) tools'. Leading experts in biodiversity and geospatial tools took part in the workshop as resource persons, and exposed the participants to recent advances in their respective fields. The participants came from different parts of the country including Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and Himachal Pradesh, and from Australia.

Among the numerous geospatial tools, the workshop focussed on those that are both free and open source. A free software tool is one which is freely available, and an open source software tool is one in which the source code is also freely available. They together are called 'Free and Open Source Software' (FOSS). Since FOSS tools are freely available, anyone with a computer or a smartphone can install and start using them. The workshop aimed to equip the participants to convert science-questions to an appropriate geospatial query that can provide the right insights/answers, using free and open source software tools. The workshop was open to a cross section of stakeholders such as NGOs, students, State Biodiversity board officials, Forest department officials and line agencies impacting on biodiversity.

Specifically, the participants were exposed to the following topics:

1. An overview of Western Ghats biodiversity and the need for Spatial data- Limitations and lacunae in current understanding based on description, monitoring and management of biodiversity.
2. How Spatial data helps provide the larger perspective for systemic understanding
3. Demonstration and Case studies of Applications of desktop, web and mobile GIS in management of biodiversity
4. Plan for intensive two week TOT workshops, utility of the trainees and mainstreaming capacity building in the respective agencies using FOSS4G tools.

Talks

In his opening remarks, T V Ramachandra, Professor, Centre for Ecological Sciences, Indian Institute of Science, explained the importance of geospatial tools in biodiversity conservation. Drawing from his vast experience in using them for his research and biodiversity conservation efforts, he suggested the participants to familiarise themselves with the geospatial tools. "If you learn spatial analysis, you can live anywhere as a spatial consultant and make big money", he said while speaking about the demand

for geospatial analysis professionals. He also sensitized the participants about the concept of free and open source software, and how they are helping create a level playing field. He ended his opening remarks by calling upon the participants to make the best use of the workshop.

In his talk, Dr. S Narendra Prasad from OSGeo Foundation, India introduced OSGeo Foundation and highlighted the advantages of using free and open source software for biodiversity conservation. OSGeo Foundation, India, works with various research, government, academic and industrial groups in solution development, and capacity building. It regularly conducts workshops to popularise free and open source geospatial tools among all the stakeholders.

Emphasizing on how technology has revolutionised the way we collect biodiversity data, Dr. S Narendra Prasad noted that anybody with a cheap Android phone can start documenting biodiversity. He also said that the technology evolves every hour, and it's a challenge to keep pace with it. Explaining how geospatial tools can help manage developmental pressures in the Western Ghats, he said that such tools can help represent socio-economic data in a visually perceptible fashion. This can give better perspective and hence can aid in better decision making. Calling upon the participants to become ambassadors of the free and open source geospatial tools, Dr. Narendra Prasad asked the participants to take lead in organising workshops in their respective institutions.

M D Subhash Chandran, Professor, Centre for Ecological Sciences, Indian Institute of Science, gave a talk on 'Western Ghats Biodiversity – Rethinking on Biodiversity Management Committees'. He began his speech by taking the participants on a virtual tour of the rich biodiversity that the Western Ghats support. It is classified as one of the eight 'hottest hotspots' of biodiversity, and 85% of the species found there are found nowhere else on the planet. Formed millions of years ago, these mountains are one of the oldest on the planet. According to Prof. Subhash Chandran, there is geological evidence to suggest that Western Ghats were formed when a piece of land broke away from the Gondwana landmass, about 150 million years ago. However, there are also theories that suggest that the West coast of India, and hence the Western Ghats, were formed about one hundred million years ago, when a landmass detached itself from Madagascar. While emphasizing the need for a better understanding of the sensitivity of the ecosystem, Prof Subhash Chandran suggested that the geospatial systems should have a microlevel approach.

Biological Diversity Act 2002 makes it compulsory for all the local bodies in India to constitute Biodiversity Management Committees (BMCs). Since this applies for all the local bodies, in principle, every panchayat, municipality, and the state government should have a BMC. As a rule, the committee should involve all the stakeholders including tribal groups and other marginalised communities. However, according to Prof Subhash Chandran, only Kerala has a BMC at each panchayat. Though other states have formed BMCs, they are not functional. In view of this situation, Prof Subhash Chandran suggested that instead of creating BMCs indiscriminately, the Government could focus on the implementation of the biodiversity act. He also explained how pharma companies are patenting the traditional Indian medicines derived from the plants in Western Ghats. Responding to a question on changing mind-set on conservation, he said, "The mind-set is changing slowly, but positively. The British killed tigers and gave them away as trophies. But, today we are spending about one crore to save each tiger".

Dr. R Prabhakar, Director, Strand Life Sciences and Senior Fellow, Ashoka Trust for Research in Environment and Ecology, gave a talk on the India Biodiversity Portal (www.indiabiodiversity.org). India Biodiversity Portal is a participatory system that aggregates and disseminates biodiversity information under open access for India. It is a completely crowd sourced database, in which the

information is added and verified by the people. On the website, anyone can document the observation of flora and fauna. According to Dr. R Prabhakar, tens of new observations are documented on the website, and some of them have even led to the description of new species through journal publication. Among those who are active on the website are a group of experts who help people identify species they observed. People can also add maps that are of use to biodiversity documentation and preservation, upload documents detailing the species and the habitat in which they were observed, form focussed groups and participate in discussions. So far, on the India Biodiversity Portal, people have recorded more than 11.5 lakh observations of more than twenty thousand species. They have created more than two hundred maps, about seven hundred documents, and formed more than forty focus groups.

Dr. R Prabhakar also noted that technology is making massive changes to the way we understand and document nature. Urging the participants to be actively involved in documenting biodiversity, he said, "Today you can document biodiversity with your mobile phones. You do not have to wait for the Government to document the biodiversity in your locality". According to him, the estimated number of species in India is between 8 and 11.2 lakh, of which only 1.25 lakh are known to scientific community, and tens of new species are being discovered every year.

Dr. Rajasri Ray from the Centre for Ecological Sciences, Indian Institute of Science, spoke about Sacred Groves, and explained how religious and cultural values of a society affect the local biodiversity. She extensively used open source geospatial tools in her study for depicting biodiversity information on maps. According to her, sacred groves are important for biodiversity conservation and ecosystem functioning.

Dr. R C Prasad and Dr. Gowtham Gollapalli from the Indian Institute of Information Technology, Hyderabad spoke about 'Scope and potentiality of open source tools and technology in biodiversity conservation'. Dr Gowtham Gollapalli is also associated with KAINOS Geospatial Technologies Ltd.

T V Ramachandra, Professor at the Centre for Ecological Sciences, IISc, gave a talk on 'Ecologically Sensitive Regions in Central Western Ghats'. He explained the ecological socio-economic factors considered for grouping the 'ecologically sensitive regions' of Uttara Kannada district. He also demonstrated how his group extensively used open source geospatial tools for conducting research.

After Prof T V Ramachandra's talk, the workshop witnessed a lively interactive session between the participants and a panel of experts. The august panel consisted of Prof. Subhash Chandran, Dr. Bharat H Aithal, Dr. Gowtham Gollapalli, Dr.S Narendra Prasad and Prof T V Ramachandra. The panel wanted to know from the participants if they were interested in attending a two-week workshop to be held in December, 2015. Quite a few participants showed interest in attending it, and the panel asked them to explain for what reason they wanted to attend that workshop. Interestingly, the main motivation for some of the prospective participants was their experiences closer to their native places. One participant from Andhra Pradesh said that historically her region was known for tiger population, but now tigers are completely wiped out. By attending the workshop, she wants to develop expertise in free and open source geospatial tools and use that knowledge to create awareness among the general public in her region. One more participant from Himachal Pradesh also cited environmental degradation in his state as the main motivator for his interest in attending the workshop in December. According to him, in the Himalayan states, human settlements are expanding rapidly and the result is rapid development with no regard for the environmental conditions. After attending the workshop, he also wanted to sensitise the people of his region about the ill-effects of such mindless development, and how such activities can cause large scale disasters at a later stage.