Report on ISPRS Summer School 2017

(Oct 30- Nov 3, 2017)

INDIAN INSTITUTE OF REMOTE SENSING
INDIAN SPACE RESEARCH ORGANISATION, DEHRADUN

Contents

1. Introduction

The International Society for Photogrammetry and Remote Sensing (ISPRS) Technical Commission V on Education and Outreach organized the ISPRS Summer School 2017 on "Geo-processing Tools and Technologies in Citizen Science" with Working Groups V/3 & V/5 and ISPRS Student Consortium (ISPRS SC) at Indian Institute of Remote Sensing (IIRS), Dehradun, India from Oct 30 to Nov 3, 2017.
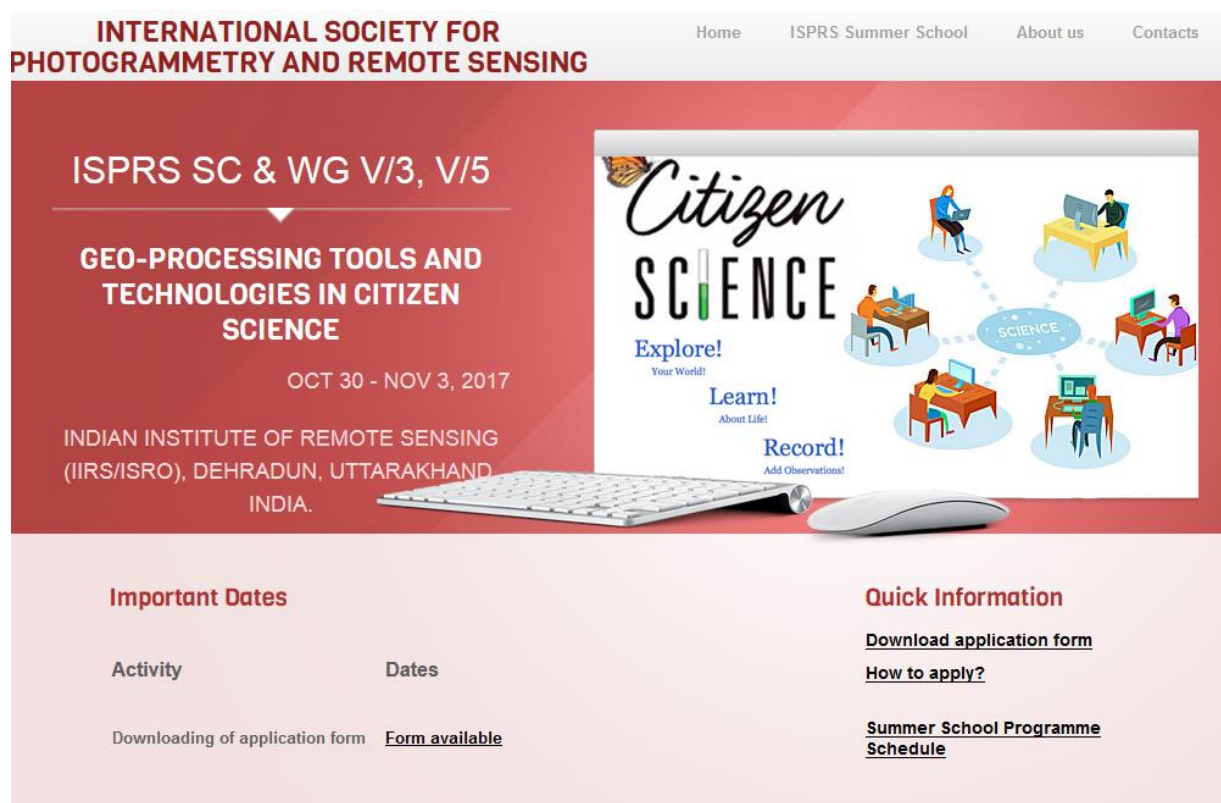

Fig. 1: Home page of Website for ISPRS Summer School 2017
(http://isprs-ss2017.iirs.gov.in/)

2. About the Course

The summer school on "Geo-processing Tools and Technologies in Citizen Science" provided an overview of evolving domain of citizen science, role of geospatial tools and technologies in citizen science along with use cases. The focus was on the data collection, quality assessment & control and analysis issues of citizen science projects. Moreover it covered different aspects and challenges of citizen science and use of geo-processing tools to increase citizen's participation and improving quality of collected data. This summer school provided an

opportunity to the participants for listening to lectures from various eminent experts with practical hands-on which inculcated interest among the participants to get knowledge and practical experience in the area of Citizen Science.

The topics covered during the course were: Role of Citizen Science in governance and disaster; Citizen Science and Earth Observation; Leveraging OSGeo ecosystem for Citizen Science, role of Geospatial Technology in Citizen Science; enabling Citizen Science using FOSS4G tools; Citizen Science data collection, management, validation and analysis; Citizen Science in mitigating natural disasters (e.g. Forest Fire and Landslide) and ISRO's Bhuvan platform for Citizen Science. The practical session were done on Open Source QGIS Software. Further participants were given hands-on on indigenously developed QGIS plugin named 'QrealTime', a QGIS Plugin for Smart Data Collection. The participants were taken for a field visit to Mussoorie for mobile based data collection using the Open Source software (Open Data Kit (ODK) Collect Android App). The students were given a compiled reading material book containing material on the above mentioned topics along with hand-on practical manuals for their future reference. The book was released during the inauguration session.

Fig. 2: Release of ISPRS Summer School Lecture Material Book during Inauguration Function Oct 30, 2017 at IIRS

Welcome address by Professor Kohei Cho, General Secretary, Asian Association on Remote Sensing (AARS) was delivered in video mode during the course inauguration.

Fig. 3: Welcome Address by Prof. Kohei Cho, General Secretary (AARS) in recorded mode

The inaugural address by Dr. A Senthil Kumar, Director IIRS & CSSTEAP and President ISPRS TC V, welcomed all the participants to IIRS and explained the importance of ISPRS Summer School. He further emphasized that students shall get enrolled to ISPRS Student Consortium to be a part of different ISPRS SC activities and ISPRS Newsletter.

Dr. Sameer Saran, Head Geoinformatics Department, Co-Chair ISPRS WG V/3 and ISPRS Summer School Course Coordinator elaborated about the course content with various aspects of citizen science covered in the summer school. He has also addressed the efforts made for the preparations with the help of Dr. Sultan Kocaman to involve eminent experts in the field of citizen science by involving Prof. Michael Goodchild and Prof. Muki Haklay through GoToMeeting mode.

Dr. Sultan Kocaman, Chair WG V/3 mentioned about the role of WG V/3 on citizen science initiatives on various themes. Ms. Sheryl Rose, Chair ISPRS SC also shared her remarks of ISPRS SC initiatives to fulfill the objectives of ISPRS TC V.

3. About the lectures delivered

The course started with an inaugural lecture through GoToMeeting on the topic 'Reflection on Voluntary Geographic Information (VGI)' by Prof. Michael Goodchild of University of California, Santa Barbara, USA.


Fig. 4: Inaugural talk by Prof. Michael Goodchild

Other eminent speakers who shared their experience and knowledge were Prof. Muki Haklay (University College London, London, UK) through GoToMeeting, Prof. Venkatesh Raghavan (Osaka City University, Osaka, Japan), Prof. Sultan Kocaman (Hacettepe University, Ankara, Turkey), Dr. Subrat Sharma (G.B. Pant National Institute of Himalayan Environment & Sustainable Development, Almora), Mr. D. Giri Babu (National Remote Sensing Centre, Hyderabad, India) and Dr. K.S. Rajan (International Institute of Information Technology, Hyderabad, India).

There were many lectures and practical work delivered by faculties of Geoinformatics Department of IIRS namely Dr. Sameer Saran, Shri Kapil Oberai, Mr. A.K. Jha, Mr. Shiva Reddy and Mr. Prabhakar Alok Verma on various aspects of citizen science which consists of concepts and demonstration of case studies which were implemented on the ground like governance, disaster, biodiversity etc. There were in total 12 lectures, 3 practical sessions, demonstration of case studies, which were followed by students project work.

The map depicts the respective countries of the eminent speakers who delivered talk (either in person or over the Internet) as part of this summer school.
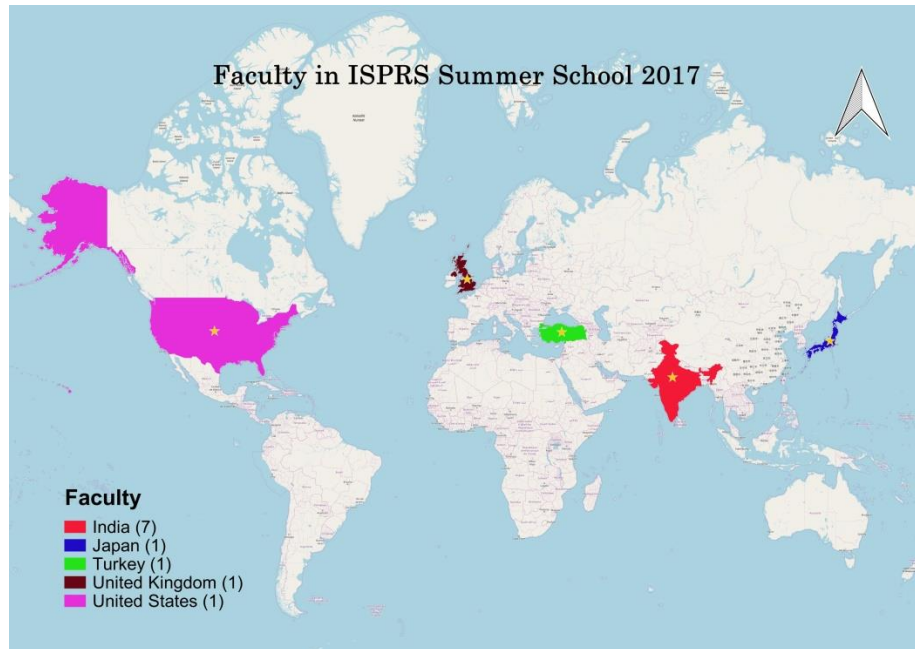
Fig. 5: Map showing countries of the speakers for the summer school

The time-table of the summer school is provided in *Annexure-II*. The students carried out pilot study work in groups related to themes like Solid Waste Management, Biodiversity, Points of Interest (POIs) etc.


(a)

(b)

I

Classroom Photographs- Lectures (a), practicals (b) and pilot study presentation (c)

4. QrealTime Plugin developed for ISPRS Summer School

This open source plugin for QGIS has been specifically designed and developed for ISPRS Summer School to provide single window solution for modern day GIS data management requirement. In this plugin we have seamlessly integrated state of the art data collection technology with the GIS software. User interface of the plugin is designed in such a way that

any QGIS user can start using this plugin instantly. Data collection forms (surveys) are generated from the GIS layer. It also support domain constraints and other advanced GIS data editing constraints. GIS user can simply create GIS and this plugin would translate same to Xform and upload to ODK aggregate server. Thus ensuring the same schema is used for field data collection and organization in QGIS. GIS user can anytime import submitted data into any GIS layer. GIS users who want their layers to be always up-to-date with the server, can use 'sync' functionality. The sync works in asynchronous mode. It always keep track of last data downloaded and only download data which is submitted after last successful sync. The QrealTime is now available in QGIS plugin directory (https://plugins.qgis.org/search/?q=QRealtime). Following screenshots shows the two GUI components of the plugin:
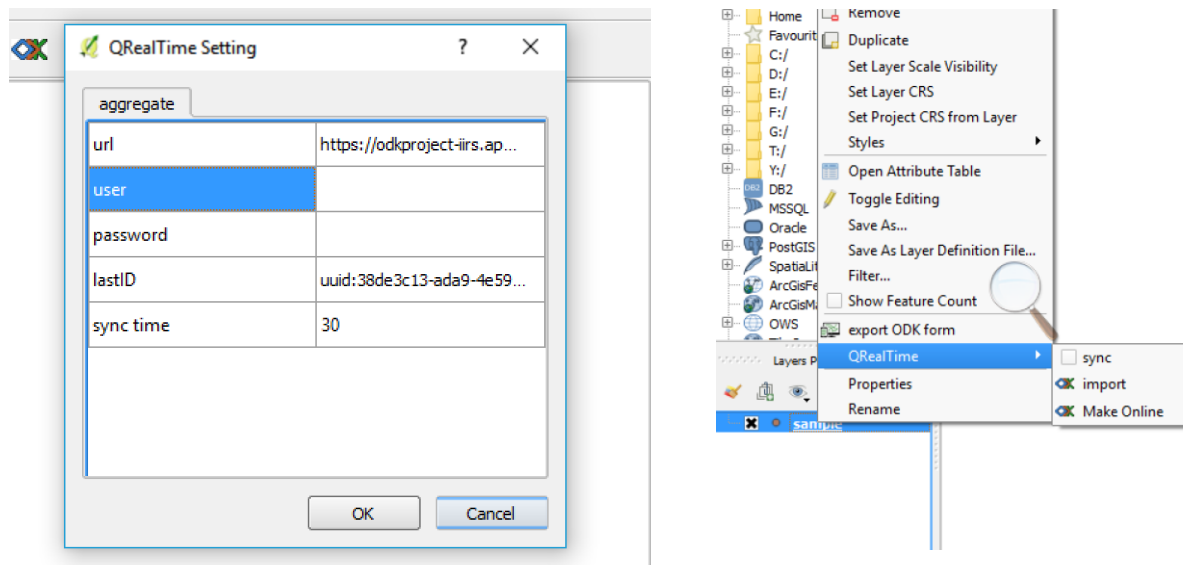
Fig. 6 QrealTime Interface through QGIS open source software

5. Pilot Projects

Students carried out pilot projects in groups. For the same they were taken for field visit to Mussoorie. The Table below summarises the pilot work done by the participants.

S.No.	Pilot Project Title	No. of Participants	Brief Summary
Group1	**Open Source Geospatial and crowdsource approach in solid waste management**	10	Students used citizen science approach to collect data on solid waste sites. Further using spatial analysis they proposed new location for placing the dustbin QGIS. Initially they designed field form using QrealTime plugin
Group2	**Geo-enable information system powered by citizen science**	12	Students designed field form in QrealTime plugin and collected Point of Interest (POI) related to tourists' amenities using ODK Collect App and also created an information system for interactive visualization.
Group3	**Identification of service gap for utilities and facilities areas**	10	Students designed field form in QrealTime plugin and collected POIs using ODK Collect App and reported the gap in services related to utilities and facilities using QGIS Software.
Group4	**Biodiversity analysis using citizen science approach**	10	Students designed field form in QrealTime plugin and then using Citizen Science approach documented species observations. Geotagged information about plants and bird species were collected and visualized.

The detailed project report of the groups are given in *Annexure I.*

6. ISPRS Summer School Participants

The course was attended by 43 participants from 9 different countries. The map below depicts the countries of the participants who participated in the summer school.
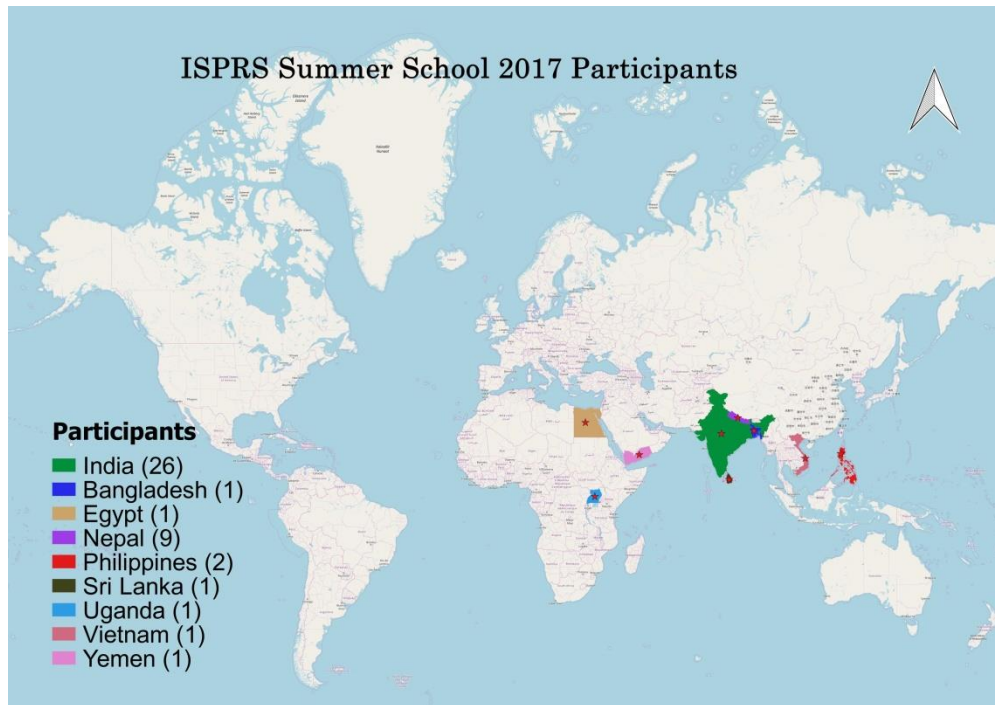
Fig. 7: ISPRS Summer School participants from different countries

Group Photograph of the participants

7. Programme Feedback

At the end of the course, a formal feedback was taken. All of the students were satisfied with the programme. 95% students have said that objectives of the course were achieved. 97% participants reported that they got benefited from interaction with IIRS faculty and guest faculty. Around 94% participants were satisfied with course structure, organization, pilot study and course content provided. Many participants suggested that the summer school should of longer duration and more time shall be given to do pilot study. From the feedback it is clear that all the participants were satisfied and the course was highly useful for them.

7.1 Post ISPRS Summer School Feedback by Mr. Nalaka Premanath Kodippili from Sri Lanka

ISPRS Summer School – 2017 has identified a very most important and timely useful theme on Geo-processing Tools and Technologies in Citizen Science for addressing the current issue of online geodatabase preparation at the IIRS training, Dehradun, India. This training had a very pertinent program for all participants and it would enable me to apply the methods to different applications while preparing a centralized citizen engaged sustainable geodatabase. This open sourced online database preparation is new to my GIS career and I was able to realize it easily due to well organized training content. As a Ph.D. student researching on Smart Urbanism Concept for Urban Development in Sri Lanka, this online geodatabase preparation is very useful for me to collect required data and analyze the data spatially for making better decisions to achieve my research objectives. Without a spatial database, it is unable to build smart urban concept / smart city concept in Sri Lanka or anywhere in the world. Also as a researcher, it is easy to collect data from the field and upload them to a web map to save time. Data accuracy can also be measured at the same time /day without spending additional time, and help enable the Go green concept.

As a visiting lecturer at the University of Sri Jayewardenepura to teach fundamentals of Geo-informatics for science students (Departments of Zoology, Biology and Aquatic Resource Development), I started to use this technology to collect data for mapping and analysis and to apply for their final research studies. Nowadays Ministry of Education has added the GIS, GPS and RS basics to the Advanced Level School Geography syllabus, and I am working as a resource person to Provincial Education Departments for teaching above syllabus to school Geography teachers island wide. I have planned to popularize the practical citizen science

techniques among teachers and students to collect school, student and related information for school/ educational planning and management activities.

As a Senior GIS Officer at the Ministry of Megapolis and Western Development, I used this technology to field data survey for preparing development plans and for various geospatial analyses to identify suitable locations for developments. In addition to that, this technology can be used to prepare a centralized geodatabase for smart application developments for governance and citizens use. Also, I will introduce the citizen science technology for consultancy works for different research and development projects, and when teaching different application developments in various government and private sector organizations.

As a developing country, Sri Lanka, it is important to create open source up-to-date and accurate geo-database for transforming the lives of citizens with smarter applications with the rapid development of the technology. Finally, I thank for the given opportunity to learn citizen science technology to apply for the Sri Lankan future developments.

8. Valedictory Function

During the valedictory ceremony, certificates of participation and momentos were awarded to the participants. This summer school was a great experience for both local and foreign participants, who were able to enjoy the culture of India, as well as understand the intricacies of the citizen science and the role of geospatial technology in citizen science.

Photographs of the Valedictory Function

9. Lectures Online

Lectures of the ISPRS Summer School on "Geoprocessing Tools and Technologies in citizen Science" will be available on the website of the ISPRS Summer School 2017 (http://http://isprssummerschool.isrs-india.org/ or http://isprs-ss2017.iirs.gov.in/) for future reference for all concerned. Lecture may be viewed online or downloaded for later use along with other reading material like lecture and practical notes along with supporting software and datasets for hands-on exercises.

(**http://isprssummerschool.isrs-india.org** OR **http://isprs-ss2017.iirs.gov.in**)

Fig. 8 ISPRS Summer School Online streaming webpage

Report Prepared By:
Dr. Sameer Saran
Head, Geoinformatics Department,
Course Coordinator, ISPRS Summer School,
& Co-Chair, ISPRS WG V/3

Pilot Project Work

GROUP 1: OPEN SOURCE GEOSPATIAL AND CROWDSOURCE APPROACH IN SOLID WASTE MANAGEMENT

1. Introduction

Solid Waste is worldwide issue. Human interference and existence of solid waste are the two sides of the same coin. Human is the only responsible entity on earth for solid waste. So, it is only our duty to tackle with this issue. Facing this reality, we have already started to solve the problem with kind of remedies. Recycling is the most common way to resolve the issue. Still it can be seen that, many countries around the world are facing the problem of proper management of solid waste. Lack of awareness among the citizens and unavailability of proper infrastructure are the major setbacks in garbage management. Current study is showing an example of Mussoorie town in Uttarakhand, India. Due to its pleasant climate, tourists from across the world are coming to visit this place round the year. As mentioned before, wherever there is human interference, solid waste problem occurs; so Mussoorie is also facing same situation. We have collected the data of random garbage locations at two major tourist spots i.e. Mussoorie Lake and Mall Road. Conditions were different at both the spots. Tourist concentration also differs at both spots. Mall road is also serving the local peoples.

The study has three major objectives: i) to acquire information of solid waste sites ii) Mapping of random garbage locations and performing geo-analysis & iii) Propose suitable locations for placing the dustbin.

2. Methodology & Data Collection

With the help of QrealTime plugin and ODK (Open Data Kit) mobile app, our team has identified 15 such garbage locations and uploaded the collected data on server. This data imported in QGIS software in shapefile format. After visual inspection of the collected points, we have refined the datasets by removing outliers and inaccurately located points. Finally 12 points have been considered for further analysis. 7 of which near Mussoorie Lake and 5 on Mall Road. We have chosen Google Map as base layer. The maps are prepared on the scale of 1:2500. We have used buffer analysis to identify the suitable location for placing new dustbins taking into consideration the well served areas (two separate dustbins for Bio-degradable and Non-biodegradable materials). 4 such locations are proposed to tackle this issue; 3 on Mall Road and 1 near Mussoorie Lake. All these locations have proposed on the basis of density of human interference in those areas. Figures 1a & 1b and figure 2a & 2b illustrate our analysis and results for Mussoorie Lake and Mall Road respectively taking into consideration different buffer size based on existing amenities. Finally this study emerged as active public participation in gathering the information which is useful for solving the solid waste problem and how citizen science or crowdsourcing along with GIS technology is an important tool to solve the day to day problems.

3. Results and discussion

Fig.1(a) Geotagged location of random garbage sites including the buffer of 50 m for identification of suitable dustbin locations.

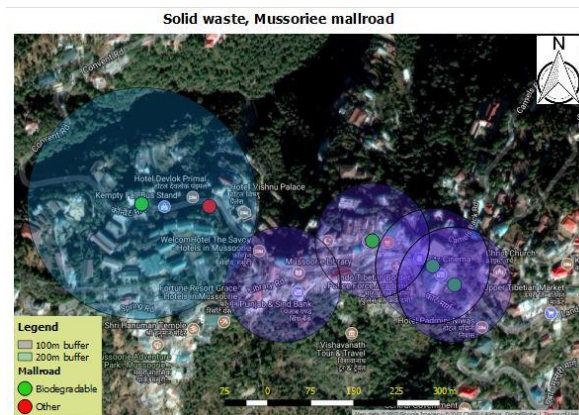Fig.1(b) Proposed and existing dustbin locations based on buffer analysis.

Fig.2(a) Geotagged location of random garbage sites including the two different buffers of 100 m & 200 m for identification of suitable dustbin locations.
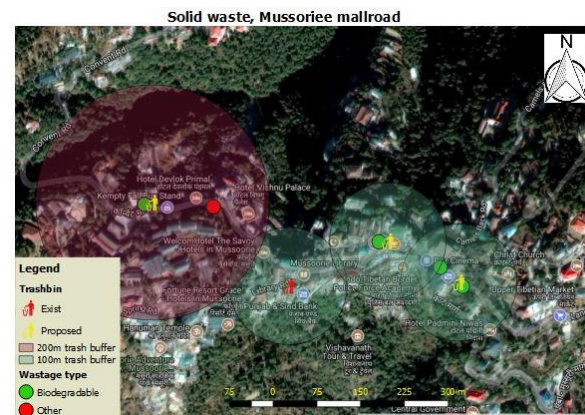

Fig.2(b) Proposed and existing dustbin locations based on buffer analysis.

S. No	Name	Country
1	Mr. Smaran Dahal	Nepal
2	Ms. Hanaa Salama Ibrahim Hammad	Egypt
3	Ms. Charmaine Cruz	Philippines
4	Mr. Sandip Dhungana	Nepal
5	Mr. Charankumarreddy Varampati	India
6	Mr. Aniruddha Deshmukh	India
7	Mr. Surendra Kumar Sharma	India
8	Mr. Saurabh Kumar	India
9	Mr. Danish Khan	India
10	Mr. Srikanta Sannigrahi	India

Group Photograph

GROUP 2: GEO-ENABLE INFORMATION SYSTEM POWERED BY CITIZEN SCIENCE

1. Introduction

Geospatial technologies is a term used to describe the range of modern tools contributing to the geographic mapping and analysis of the earth and human societies (https://www.aaas.org/content/what-are-geospatial-technologies). Geospatial technology integrated with Information system helps users, researchers and, organizations to generate, collect, store, modify and, analyze the data. Citizen science is the involvement of the public in scientific research-whether community-driven research or global investigations (http://citizenscience.org/). Geo-Enable Information System powered by citizen science is a system to integrate community driven research or citizen science with geo-Enable information system.

Present report takes Point of Interest for tourists' amenities and services as a case to demonstrate the application of geo-Enable information system powered by citizen science. Mussoorie 'The Queen of Hills', was taken as a case study for the research. It is a wonderful hill station in Uttrakhand state of India, situated at a height of 2005 m above the sea level (https://www.euttaranchal.com/tourism/mussoorie.php).

2. Methodology

The methodology of the research is divided into four parts. First part of the methodology includes the assignment of study area, the process of problem identification, followed by data collection, filtration of data and, creation of base map. The data collection process was performed with the help of ODK system. This system helps users to prepare questionnaire and collect data with the combination of open platform (ODK) and smart phones. This system enables to collect the geographical location (latitude, longitude and, elevation), and photograph of the case along-with other required information.

Second part of the methodology includes identification of requirements, professionals' input, and application of ODK collector and hosting of the technology in the system.

Third part of the methodology includes the process of data analysis, creation of thematic maps, network /service area analysis and, creation of tourist map.

Fourth and the final part of the methodology includes creation of web portal which will take filtered data as input. This web portal will also incorporate comments and updates from the users' side. Weather map, open street map and google map layers will be used for spatial information generation. This web portal will have the facility for open data integration. This web portal will be used for smart applications in the field of governance, tourism, and for citizens & entrepreneurs.

3. Data collection and Analysis

Data was collected with the help of ODK system. Data was collected at two major spots. The first spot lies in Dehradun- Mussoorie road at the distance of 6.5 km from Mussoorie. Total 18 POIs were collected at this spot. The second spot lies at the mall road of Mussoorie. Total 31 POIs were collected at this spot. These points were corrected with the help of raster analysis,

convex hull analysis and cluster analysis to remove the biasness (wrong data set). For percentage share of the class of data set please refer **Fig. 1**.
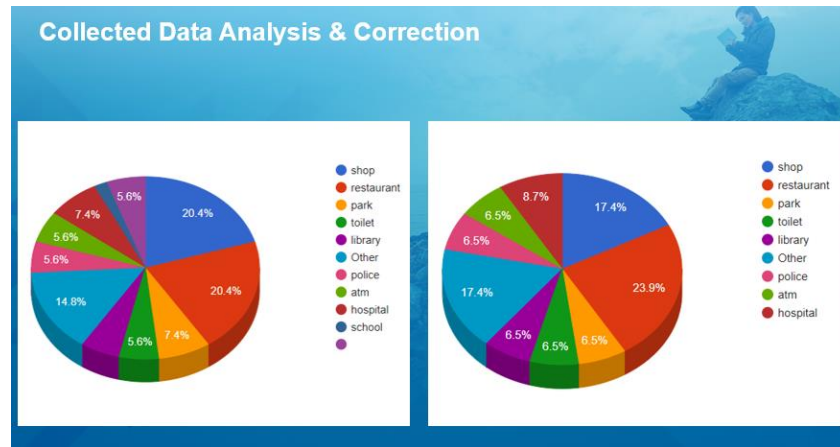
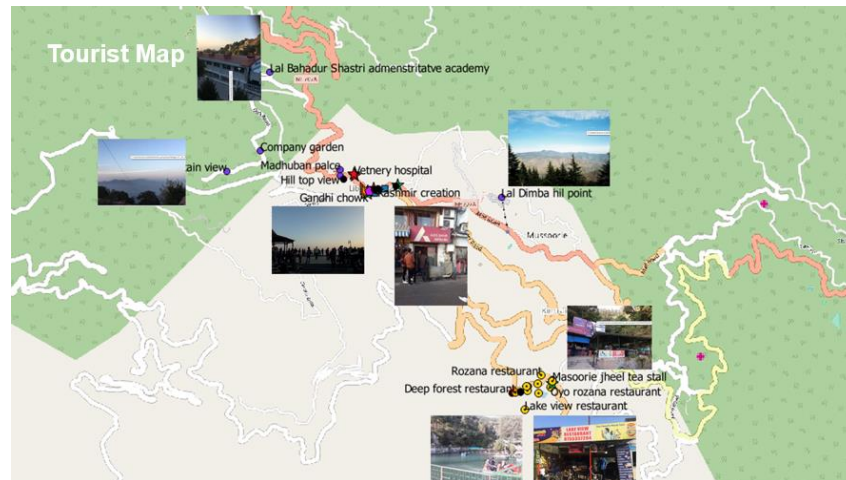*Figure 1: Data before and after correction*

A map was prepared to show the spatial distribution of total collected POIs in QGIS (**Fig. 2**).
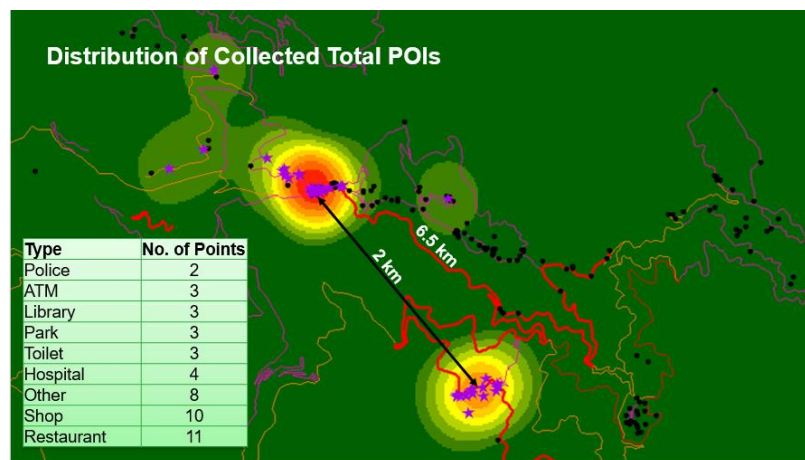
Figure 2: Spatial distribution of total collected POIs

A tourist information map was generated with the help of information gathered in the survey (**Fig. 3**).

Figure 3: Tourist information map

4. Results and discussions

From the sample points collected in the field survey we can assert that the percentage distribution of POIs and tourists' amenities and services are 23.9% restaurants, 17.4% shops, 8.7% hospitals and medical stores, 6.5% toilets, 6.5% ATMs, 6.5% library, 6.5% parks and 17.4% others. Some of the problems identified during survey was lack of benches and street lights. Some of the benches were captured by vendors.

Data points were classified based on distance from the road in QGIS platform. The distribution of the data points are 42 POIs at 50m, 2 POIs at 100m, 2 POIs at 200m and 3 POIs at 500m from the road.

A website and mobile application (App) was created which integrates the data related to 1) transport, 2) maps/locations, 3) access data/spreadsheets, 4) social media, 5) big data, 6) services, 7) DBMs, 8) sensor networks and, 9) land data. This system will enable to any kind of mobile or computational devices, at any geographical location, at any time by any person for data management, planning and analysis, workforce optimization and operational awareness. This system works on the concept of providing real time solution for high velocity monitoring and alerting. This system also incorporates performance improvements and smart services (**Fig. 4 & 5**).

Figure 4: Geo-enable information system

The major challenges faced in this study are:-

a) Removal of biasness from the collected data sets.
b) Accurate location identification (with base maps and GPS points).
c) ISP connectivity problems.
d) Accessibility for data collection.
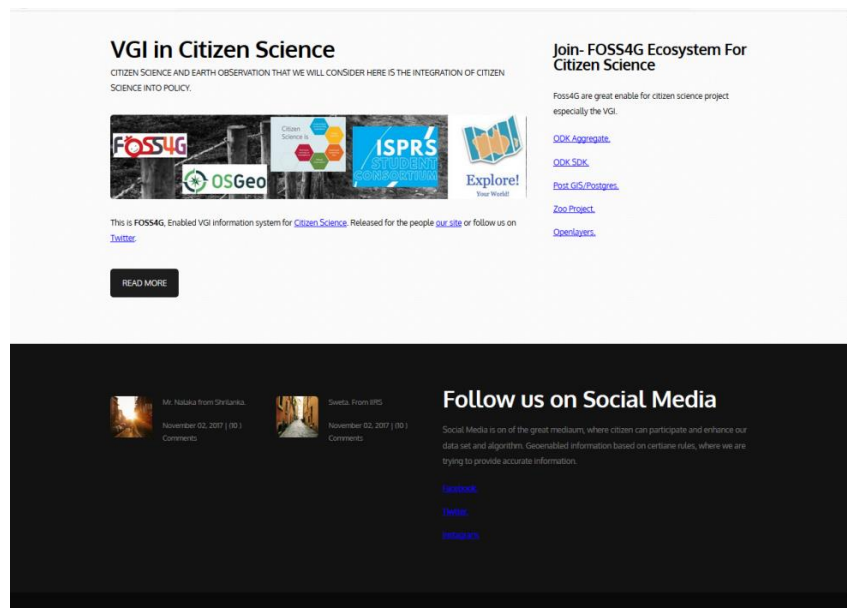e) Identification of collection source.

Figure 5: VGI in Citizen Science

So, we can conclude that the knowledge of geo-spatial technology integrated with citizen science:

a) Helps to make a powerful open map portal for real time data collection.
b) Data filtering, management, storing, security and privacy is a challenge.
c) Can be applied to different sectors for getting benefits for all the citizens.

5. Future prospects and take home

Open data collection methods and techniques can be use the build an up-to date geospatial data base for providing sustainable solutions to smarter communities. With the technology developments, citizens move to the smart solutions to solve their day today spatial challenges. The centralized geodatabase would bring advances to Data Management, planning and analysis and to make better decisions within a short period of time using any device from anywhere in the world at any time anyone.

In addition to that open data collection techniques will be used to train citizens, students, state or private sector staff. Also disaster risk mitigation, tourism, governance, urban infrastructure developments, and environmental studies

6. Group Members

Sl. No.	Name
1	Nalaka Kodippili
2	Vinay Gangare
3	Diwakar K.C.
4	Florencia Tuladhar
5	Shahar Bano
6	Sigilipalli Swetha
7	Salman Khan
8	Shahid Rahmat
9	Vivek Priyadarshi
10	Deeksha Singh
11	Do Hang
12	Matina Tuladhar

GEO-ENABLE INFORMATION SYSTEM
POWERED BY CITEZEN SCIENCE

ABOUT VGI   TEAM   JOIN CITIZEN SCIENCE   MAPS   CONTACT US

Meet our Team Members
ISPRS SUMMER SCHOOL-2017, IIRS-ISRO DEHRADUN

Nalaka Kodippili(Sri Lanka), Vinay Gangare (India), Vivek Priyadarshi, Shahid, Florencia Matina Tuladhar, Diwakar KC, Shahar Bano, Deeksha Singh, Sigilipalli Swetha, Salman Khan, Do Hang(Vietnam) .

Group – 3: IDENTIFICATION OF SERVICE GAP FOR UTILITIES & FACILITIES AREAS

1. **Introduction.**

As a part of the ISPRS summer school, a pilot project was conducted using ODK collect app and QGIS as open source software. Different aspects such as challenges of citizen science, use of geo-processing tools to increase citizen's participation, and to improve the quality of the collected data were the main topics of the project. In this project, technology of citizen science, crowd sourcing and ODK collect were used to carry out analysis on collected 23 point of interests (POI) by Group – 3 comprised with ten members.

Within the broad guideline of Summer School, the objective was to identify the service gap for Utility and Service area.

2. **Methodology**

First step was the server installation which was done using the ODK aggregate server. Then the format for data collection was created. It contained fields like name, longitude, latitude, altitude, accuracy, name, type, photos and comments. The data were collected by the members of the group and uploaded to the server. Data analysis was also done.

3. **Study Area**

Mussoorie area is chosen for our study area in this pilot project. It is a hill station and a municipal board in the Dehradun District of the northern Indian state of Uttarakhand. It is about 35 km from the state capital of Dehradun and 290 km north of the national capital of India, New Delhi. This hill station is in the foothills of the Garhwal Himalayan range. The pincode for Mussoorie is 248179.

4. **Data collection**

The collected data include banks, parks, police station, ATMs, schools, shops, restaurants**.** We divided different point of interests among ourselves and collected data using the ODK collect app installed on our smart phones.

We have sent volunteers to the field to carry out data collection which was on the way to Mussoorie and we made two stops, one at Mussoorie Lake and the other at the city library. We used software like ODK collect, ODK aggregate server and QGIS.

First stop we made was at Mussoorie Lake where the data was collected using the ODK Collect app installed in our smart phones. The second stop was at the central library where further data was collected along with the information the photo of the point was also taken. We collected a total of 23 points, which include 6 shops, 8 restaurants, 3 libraries, 2 toilets, 2 ATMs, 1 park, 1 hospital and 2 other features.

The data collected was uploaded to the server; which was later used to visualise the accuracy of the data collected using pie charts.
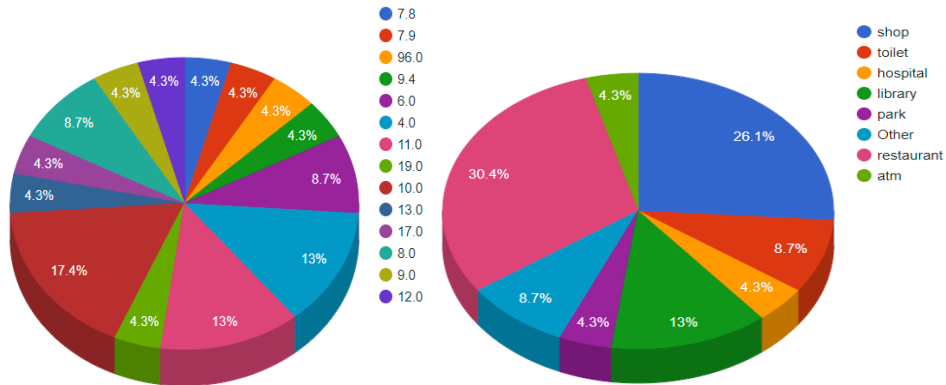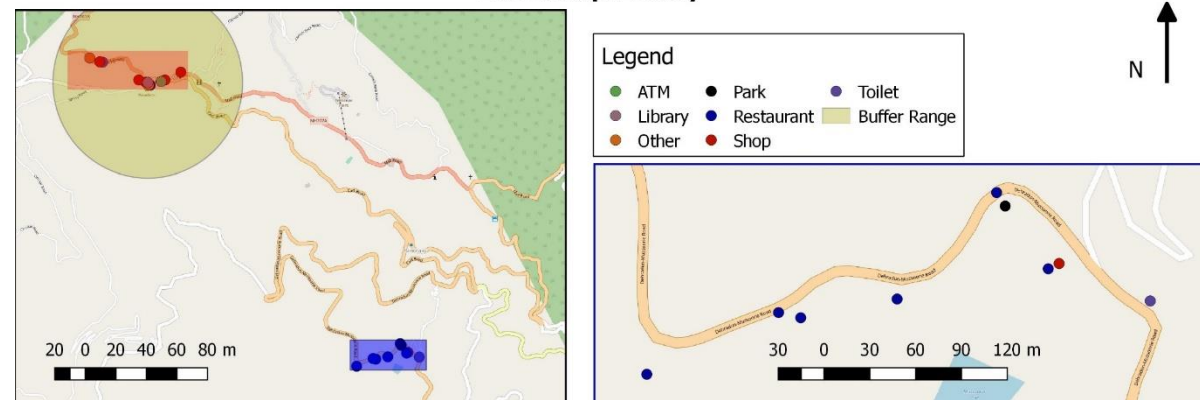
Then using QGIS, a map of the data was made and the points where marked on google maps for better understanding then the buffer zones for some points like toilets, libraries and ATMs where made using QGis and the studies show that the points like ATMs and toilets are not sufficient to cater the needs of the people.
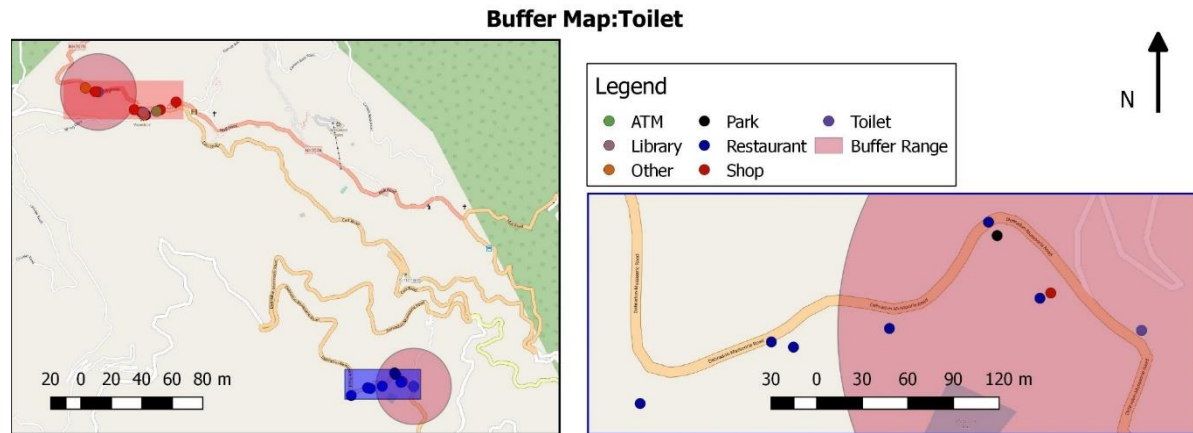
Buffer Map: ATM
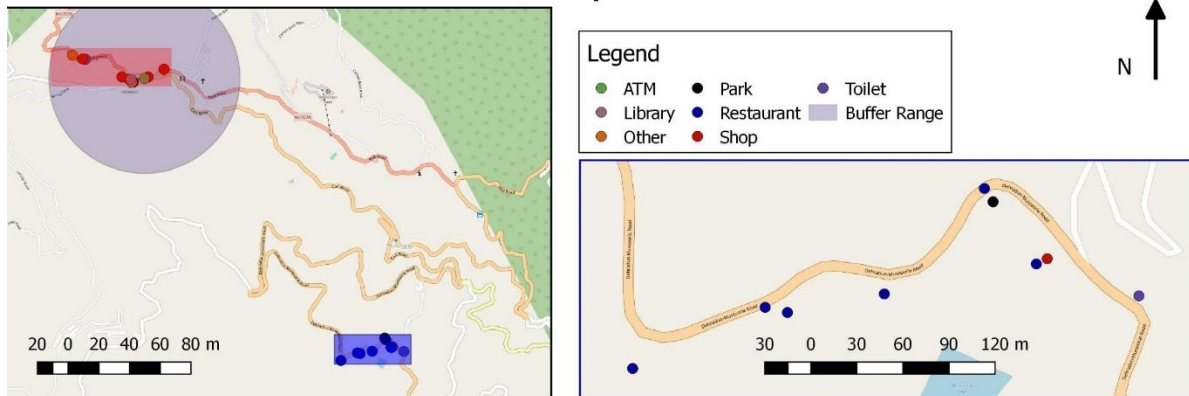
Buffer Map: Library

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Fig. 1 Buffer analysis of service utilities

5. Conclusions

Citizen science has grown in recent years and played a significant role in many sectors like biodiversity, road network, agriculture, disaster, etc.

After analysis of open source data, it was found that improvement of service facilities in many areas is needed. The existing facilities and services cannot cover the entire area.

Group Members

1	Md Zakir Hossain
2	Milan Subedi
3	Kabiraj Rokaya
4	Mohammed Sultan
5	Fiza Masood
6	Ashmita Jessie Sen
7	Mohammed Faiz
8	Faheed Jasin
9	Himanchal
10	Priyanka Singh

Group 4: BIODIVERSITY ANALYSIS USING CITIZEN SCIENCE APPROACH

1. Introduction

The recent and rapid digitization of biodiversity data from natural history collection (NHC) archives has enriched collections based data repositories; this data continues to inform studies of species' geographic distributions (Glon et al., 2017). In present world Citizen Science data is used for documenting species observations i.e. observations collected by citizens in a non-standardized way which is becoming increasingly available. In the absence of scientific observations, this data may be a viable alternative for a number of research questions.

2. Methodology

The task provided to group four was to gather data of biodiversity in the projected area. We took 33 plant and 4 bird species by selecting two spots one Mussoorie Lake and second the Mall Road. For reference data of species presence, details include on ODK mobile application (generated automatically using ODK on mobile) Latitude / Longitude, Elevation, Location accuracy, Time of observation, Routes/Tracks, Categories/Type: like plant, birds etc, Common name, Scientific name (if known), Color Photo, Other remarks and descriptions.
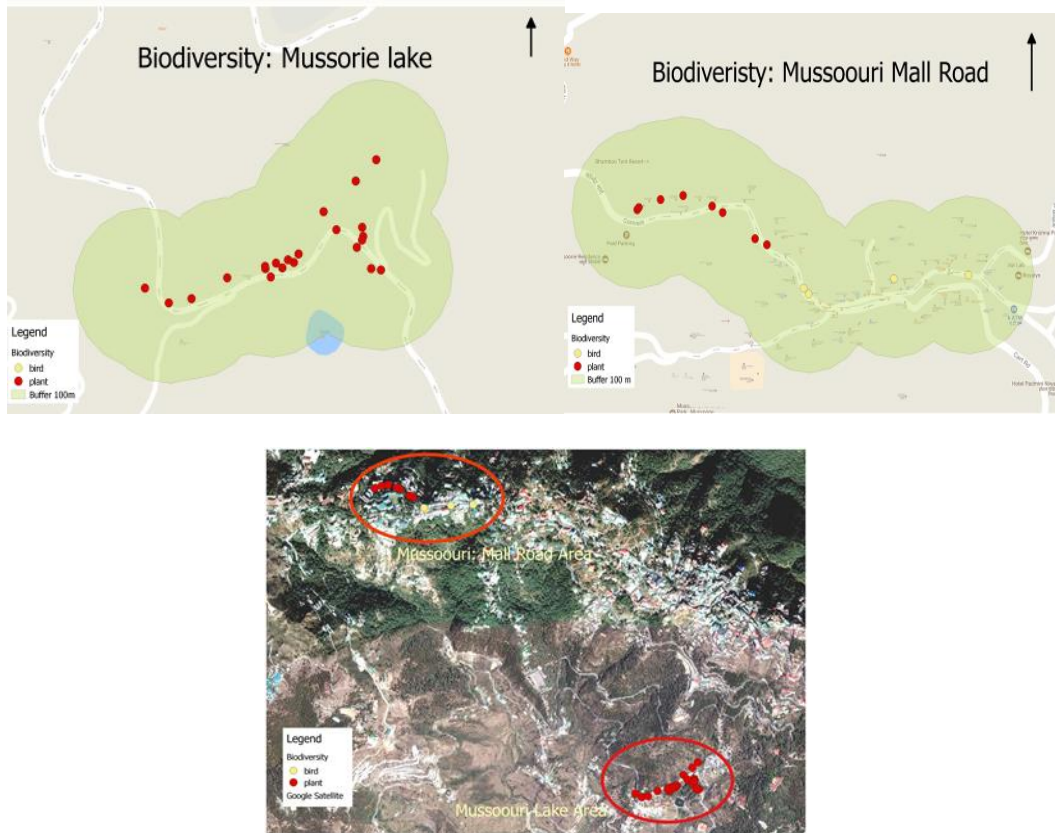

Fig.1: Map showing the biodiversity in Mussorie Lake and Mall road.

3. Results and discussion

This biodiversity data can be used:

- To find out the extent of the spatial distribution of a plant and bird species in the area of interest.

- To find suitable habitat of plant and bird species based on the different biophysical and topographic characteristics of the area of interest.
- To find out the level of species diversity of the area of interest (species richness)
- To delineate of potential areas for protection and conservation.

Reference

Glon E. Heather, Heumann W. Benjamin, Carter J. Richard and Bartek M. Jessica, 2017. The contribution of small collections to species distribution modelling: A case study from Fuireneae (Cyperaceae). Ecological Informatics 42, pp. 67–78.
http://dx.doi.org/10.1016/j.ecoinf.2017.09.009

Group Members

1	Abinash Subedi
2	Angelica Kristina Monzon
3	Charles Jjuuko
4	Juhi Priyanka Horo
5	Kingsley Ashish
6	Saurav Gautam
7	Shah Masudul Islam
8	Suman Chakraborti
9	Tripti Jayal
10	Vikram Sharma

ISPRS Summer School - 2017

Geo-processing Tools and Technologies in Citizen Science
(Oct 30 - Nov 3, 2017)

Day 1 - 30/Oct/2017		
0900 – 0930 hrs.	**Inaugural Address**	**Prof. Michael Goodchild (University of California, Santa Barbara, USA)**
0930 - 1100 hrs.	Registration	
1100 – 1200 hrs.	Tea Break and Discussion	
1200 – 1300 hrs.	Role of Citizen Science in Governance and Disaster	Prof. Sultan Kocaman (Hacettepe University, Ankara, Turkey)
1300 – 1400 hrs.	Lunch	
1400 – 1430 hrs.	Citizen Science for Observing and Understanding the Earth	Prof. Muki Haklay (University College London, London, UK)
1430 – 1730 hrs.	Practical: Mobile Based Data Collection using Open Source Tools	Mr. K. Shiva Reddy/ Kapil Oberai/ Prabhakar Alok Verma (IIRS)
Day 2 - 31/Oct/2017		
0900 – 1000 hrs.	Leveraging OSGeo Ecosystem for Citizen Science	Prof. Venkatesh Raghavan (Osaka City University, Osaka, Japan)
1000 – 1100 hrs.	Role of Geospatial Technology in Citizen Science	Dr. Sameer Saran (IIRS)
1100 – 1200 hrs.	Tea Break and Discussion	
1200 – 1300 hrs.	Enabling Citizen Science using FOSS4G Tools	Mr. Kapil Oberai (IIRS)
1300 – 1400 hrs.	Lunch	
1400 – 1730 hrs.	Practical: Hand-on Mobile Based Data Collection using Open Source Tools	Mr. K. Shiva Reddy/ Kapil Oberai/ Prabhakar Alok

		Verma (IIRS)
Day 3 – 1/Nov/2017		
0900 – 1000 hrs.	Citizen Science Data Collection and Management	Mr. A.K. Jha (IIRS)
1000 – 1100 hrs.	Citizen Science Data Validation and Analysis	Mr. K. Shiva Reddy (IIRS)
1100 – 1200 hrs.	Tea Break and Discussion	
1200 – 1300 hrs.	ISRO's Initiatives in Citizen Science	Mr. A.K. Jha (IIRS)
1300 – 1400 hrs.	Lunch	
1400 – 1730 hrs.	Practical: Geoprocessing and Visualization of Collected Data	Mr. K. Shiva Reddy/ Kapil Oberai/ Prabhakar Alok Verma (IIRS)
Day 4 – 2/Nov/2017		
0900 – 1000 hrs.	Role of Citizen Science in Mitigating Natural Disasters (e.g. Forest Fire and Landslide)	Dr. Subrat Sharma (G.B. Pant National Institute of Himalayan Environment & Sustainable Development, Almora, India)
1000 – 1100 hrs.	Bhuvan Platform for Citizen Science (Visualization and Analysis)	Mr. D. Giri Babu (National Remote Sensing Centre, Hyderabad, India)
1100 – 1200 hrs.	Tea Break and Discussion	
1200 – 1300 hrs.	Pilot Project	
1300 – 1400 hrs.	Lunch	
1400 – 1730 hrs.	Pilot Project	
Day 5 – 3/Nov/2017		
0900 – 1000 hrs.	Role of Open Data in Citizen Science	Dr. K.S. Rajan (International Institute of Information Technology, Hyderabad, India)
1000 – 1100 hrs.	Pilot Project	

1100 – 1200 hrs.	Tea Break and Discussion
1200 – 1300 hrs.	Pilot Project Presentation
1300 – 1400 hrs.	Lunch
1400 – 1600 hrs.	Pilot Project Presentation Contd.
1600 hrs.	**Feedback and Valedictory**