Environmental Leadership & Training Initiative

COURSE REPORT

INTRODUCTION TO R: A TOOL FOR DATA ANALYSIS OF ECOLOGICAL RESTORATION MONITORING

September 3-5, 2018
Samboja, East Kalimantan, Indonesia

A workshop organized by:
Environmental Leadership & Training Initiative (ELTI),
Tropenbos Indonesia Program (TBI) and
Research & Development Institute for Natural Resource Conservation Technology (BALITEK-KSDA)

Course participants and organisers.

Background: Monitoring and data analysis are key components of forest restoration that allow for the accurate reporting of results and further the development of innovative restoration strategies. Data analysis, however, is one of the most limiting aspects of restoration projects in Indonesia and ecological research more generally. One major source of the problem is that powerful data analysis platforms are either poorly understood due to the complicated nature of their use or are very expensive.

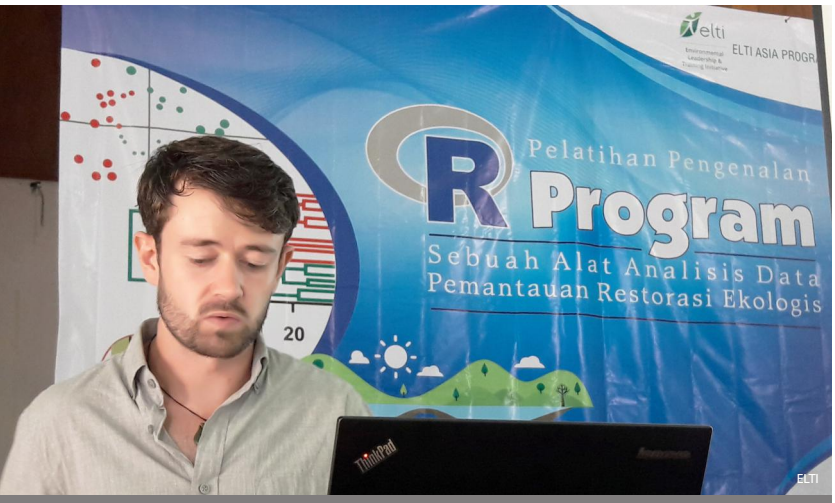
Opening ceremony with Dr. Arbainsyah and Mr. Ahmad Gadang Pamungkas.

R is a statistical computing program that is used widely by ecologists for data analysis. It is open source and therefore can be downloaded by anyone and used for free. Unfortunately, it is notoriously hard to learn, which often discourages beginners from getting past the initial challenge of becoming acquainted with the program and understanding how it works. Once the initial hurdle of learning the program is overcome, R can become a valuable tool for any researcher or land manager who needs to process ecological data.

This training, held at Balitek-KSDA, was designed to give students the knowledge and tools to surpass that initial hurdle to learning R. R is a computer programming language and as with any language, learning is an ongoing process. This course therefore was organized to connect students who are learning the software and form a network so that the students can use each other as resources to tackle the challenges of R as a team rather than on their own. It was hoped that the network would persist long after the course is complete.

Objectives:

1. Provide knowledge and tools to get past the initial hurdle of learning the basics of R and begin to tackle challenges in R independently.
2. Widen the range of participants who are able to conduct data analysis.
3. Show the power of R in order to inspire participants to continue studying the program.
4. Create a network of people learning R to tackle challenges together and encourage each other to continue studies in R after the course is completed.
5. Demonstrate the use R for data analysis of ecological restoration monitoring results.



Mr. David Woodbury giving an introduction to the R statistic program.

Mr. David Woodbury explaining the function of R to participants.

Participants practicing the R functions.

Program

The training started with an Opening Ceremony, including a prayer and opening remarks by Dr. Arbainsyah (ELTI Asia Program Assistantand Mr. Ahmad Gadang Pamungkas (Head of BALITEK-KSDA. Mr. David Woodbury (Yale Master's degree student conducting his thesis research at ELTI's focal training site in East Kalimantan then gave an introductory presentation about R. Afterwards, participants downloaded R and R studio and installed them on their computers. During the first two days of training, Mr. Woodbury conducted short presentations introducing each of the four lessons to explain key terminology and concepts before demonstrating on a computer at the front of the class. Students followed along on their own computers and then practiced on their own. Various data sets were used including data on trees from Barro Colorado Island in Panama.

On the final day of the training, the participants were divided into 3 groups. One group worked with fauna data from Ms. Ulfah Karmila Sari (Balitek-KSDAwhile the two other groups worked with flora data from Dr. Arbainsyah using R scripts from the internet. Each group then presented their results to the organizers, including an explanation of the analysis conducted, a description of their operations in R and a description and interpretation of their results. Mr Woodbury and fellow participants asked questions and provided feedback. Dr. Arbainsyah then provided an introduction to the ELTI Leadership Program, which the course alumni could apply to for additional training, professional development, and project support. The training ended with a course evaluation and closing remarks by Dr. Arbainsyah, Mr. Woodbury and Mr. Pamungkas.

Working groups of participants.

Mr. David Woodbury helping participants create a graph using the R program.

Course participant presenting his group's results.

Mr. Ahmad Gadang Pamungkas giving a gift to Mr. David Woodbury during the course closing.

Participants:

The training was attended by 18 representatives from BALITEK KSDA, Pusat Pengendalian Pembangunan Ekoregion Kalimantan, Balai Besar Dipterokarpa, Balai Konservasi Sumber Daya Alam Kalimantan Timur, The Nature Conservation, Jejak Pulang Foundation and the University of Mulawarman.

Follow-up:

The participants remained very active throughout the training, with some expressing the need for additional follow-up training and practice. A WhatsApp group was created so that participants could easily converse with each other about R and follow-up with Mr. Woodbury if any questions arise.

This event was possible thanks to Arcadia, whose Environmental Conservation grants support programmes that protect and enhance biodiversity, and provide field training and academic research.