

Field experiments of an ecotourism support system in tropical forests

Tetsuhiko Yoshimura^{*}, Seca Gandaseca^{**}, Mitsutoshi Abe^{*} and Tetsuro Sakai^{*}

1. Introduction

Indonesia lost 13,124,000 ha of its forests during 1990 to 2000 due to commercial, logging, forest fire, shifting cultivation, and plantation development such as oil palm and rubber. However, there is no panacea to conserve forests in Indonesia or other developing countries because timber is often the largest income source for forest-related industry. Ecotourism brings economic benefits to local people who provide tourists with local food, souvenirs, accommodation and tour guides while conserving the natural environment. Thus, local people are motivated to conserve their forests since they can earn income through ecotourism activities. In this study, we designed and developed an ecotourism support system using up-to-date information technology. This system was evaluated through field experiments in Indonesian tropical forests.

2. Methods

Field experiments were carried out in the Bogor Agricultural University Forest in Gunung Walat located in west Java, Indonesia. The developed system consists of a GPS receiver and external antenna (Trimble Pathfinder Pocket), a PDA (TOSHIBA e335) with the operation system of Pocket PC 2002, a cap with a pocket for the external antenna and a waist bag. The user's position is determined every second by the GPS, and the user's current position is displayed on the map while walking in the forest. Meanwhile, nature information appears on the PDA at some information points. The distances between the user and all information points are calculated each second. Considering the error in GPS positioning without a differential GPS is 10 to 20 m, the user's position is determined by averaging the latest five position fixes. When the distance between the user's position and an information point is shorter than 10 m, nature information for the point will appear on the PDA. The coordinate and nature information for each information point are stored in the PDA. Each PDA contains log files, in which operation history, tracks determined by GPS, HTML file names referred, and quiz scores are stored. These files were used to evaluate educational efficacy in this study. For the field experiments, 25 test subjects were recruited from Bogor Agricultural University.

3. Results and discussion

The results showed that more than 80% of the participants evaluated the system as excellent or good in terms of interest, enjoyment, and operation. On the other hand, only 40% of the participants answered that quizzes and nature information appeared at the accurate points. As for GPS signal reception, the appearance rates of educational materials at some information points were less than 70% due to large diameters, great heights and high stand density of *Agathis* trees in the study site. According to the questionnaire results, it was found that there was positive education efficacy in terms of acquisition of information and knowledge on nature.

Keywords: ecotourism support system, field experiment, GPS, PDA, tropical forest

^{*} Grad. Sch. of Informatics, Kyoto University, Kyoto 606-8501, Japan

^{**} Fac. of Agric. and Food Sci., UPMKB (Universiti Putra Malaysia Kampus Bintulu), Bintulu 97008, Malaysia