

УДК 378.147.88/ 502.34

ECOLOGICAL TRAILS AS A MEANS OF ECOLOGICAL EDUCATION  
FOR FUTURE TOURISM PROFESSIONALS

M. V. VARDANYAN \*

*Brusov State University, Armenia*

The article discusses the essence of ecological trails, presenting the definitions found in the professional literature. The main goals of the creation and the usage of ecological trails are discussed. The criteria for classifying ecological trails and the features of their creation are briefly presented.

The article also highlights the educational significance of ecological trails, emphasizing their role in acquiring professional knowledge and enhancing students' skills particularly for tourism department students.

As a case study, the ecological trail at Yerevan Botanical Garden is analyzed to demonstrate its role in developing ecological competence of future tourism professionals. The article further proposes to organize an extracurricular lesson at Yerevan Botanical Garden aimed at developing students' professional skills.

<https://doi.org/10.46991/PYSUC.2025.59.1.069>

**Keywords:** ecological trail, future tourism professional, ecological education.

**Introduction.** Modern society's unsustainable lifestyles and insufficient environmental literacy have led to one of today's most critical global challenges. Ecological education plays a vital role in somehow mitigating the environmental crises humanity is facing today.

The role of ecological education is particularly significant in the context of tourism education. The importance of integrating ecological education into tourism education is driven by the growing role of sustainable and nature-based tourism which, in turn, leads to an increased demand for environmentally literate and conscious professionals in the tourism sector.

One of the means of organizing ecological education for future tourism professionals is ecological trails. These trails can be an essential learning tool, combining theoretical knowledge with real-world experience. Furthermore, they will enable future tourism professionals to acquire the fundamental knowledge and skills necessary for promoting sustainable and responsible tourism development. These factors determine the relevance of the topic.

According to Hrachya Acharyan's "Explanatory Dictionary of Modern Armenian Language", a trail (or path) is a narrow path paved by foot [1]. Throughout

---

\* E-mail: [merivardanyanv@gmail.com](mailto:merivardanyanv@gmail.com)

history, trails have been used for various purposes: commercial, religious, tourism, educational, etc.

The trails used for educational purposes are referred to in different ways: “nature trails”, “green trails”, “natural trails” and “ecological trails”. The above-mentioned terms are equivalent in terms of content, but the term “ecological trail” will be used in this article.

The purpose of this article is to present ecological trails as a means of forming ecological competence of future tourism students.

The research objectives are to study the concept of “ecological trail”, to emphasize the educational significance of ecological trails and, with the case study of the ecological trail at Yerevan Botanical Garden, to show their role in the process of implementing ecological education of future tourism professionals.

The novelty of the research is determined by the fact that ecological trails are presented as a means of developing ecological competence among future tourism professionals.

**Research Methods.** The research methods used in the article include the study of professional literature, analysis, comparison and summarization.

**The Essence of Ecological Trails.** The purpose of developing ecological trails for educational purposes is discussed in the interrelation of three main components: recreation, training and education. The significance of these trails lies in their ability to create optimal conditions for fostering environmental consciousness among learners [2].

Professional literature presents various definitions of ecological trails. The ecological trail is defined as “a well-maintained, often pedestrian route that includes various biocenoses, landscapes and areas of cultural and historical value” [3]. According to another definition, the ecological trail is a route that passes through natural areas that have aesthetic, environmental and historical value [4]. An ecological trail is also defined as “a special route through a natural area, which is used for environmental and educational purposes, aiming at minimizing negative impacts on the environment” [5]. Combining the above-mentioned definitions, we can note that ecological trails are routes that include natural as well as man-made objects and are used for educational purposes.

Ecological trails developed for educational purposes are designed to solve the following problems:

- educational-cognitive (familiarization with the local flora and fauna, study of various ecosystems and identification of ecological connections between plants, animals and environmental conditions, analysis of the impact of human activity on ecosystems, familiarization with scientific methods of studying natural objects, acquisition of self-education and research skills);
- developmental (development of cognitive processes such as attention, memory, thinking, perception, observation, creative skills);
- educational (formation and development of environmental culture);
- health-improving (combination of mental work and physical activity in natural areas) [6].

Ecological trails are classified according to various criteria:

- according to their duration – short and long;

- according to the means of transport – pedestrian, bicycle, automobile;
- according to the type of direction – linear, semicircular, circular, branched;
- according to the level of informational content – educational-cognitive, scientific-educational, touristic and cognitive-hiking [3].

The development of an ecological trail is implemented in multiple stages: organizational, route planning and mapping, design and improvement, route operation [6].

At the organizational stage, it is necessary to create an initiative group of students headed by a lecturer. The lecturer of the course (“Geography of the Republic of Armenia”, “Ecology and Fundamentals of Nature Studies”, “The Organization of Ecotourism”, etc.) can act as the group leader. When designing the trail, the geographical features of the terrain, existing obstacles, the length of the trail, the steepness of the slopes, the speed of the river flow are taken into account, which play a significant role in the process of developing the trail.

At the stage of planning and mapping of the route of the ecological trail, it is necessary to involve students with knowledge of Geography, particularly Cartography and Information Technologies. The lecturers of the courses “Geography”, “Information Technologies of Tourism”, “Historical and Cultural Heritage” can also be involved in this work as consultants. The group studies the route of the trail in detail, picks out the objects to be exhibited along the route, the location of observation decks and recreation areas, the layout and placement of information boards, signs. A detailed map is created marking all natural and man-made objects and designated stopping points along the trail.

The stage of designing and improving the trail includes cleaning the area, installing information boards, marking activities, as well as equipping the trail with permissive, warning and prohibitive signs. At this stage, it is necessary to involve a larger number of students.

The operational stage represents the final phase of the trail development, encompassing not only day-to-day management but also long-term conservation and maintenance efforts.

***The Educational Significance of Ecological Trails.*** Ecological trails serve as a vital tool for ecological education enabling students to develop ecological thinking and culture. Ecological trails are effective forms of learning due to the integrated approach, the usage of interactive methods, as well as the active participation of students in their development and operation. The development of an educational ecological trail and all related tasks rely on the individual and group activities of students. Moreover, when integrated into educational programs, ecological trails can incorporate interactive methodologies such as gamified learning, structured debates, problem-solving tasks, and field research techniques [6].

The educational value of ecological trails lies in their ability to help students develop ecological literacy, environmental stewardship competencies, practical wilderness skills and field research skills.

The organization of extracurricular classes on ecological trails allows students to consolidate the theoretical knowledge gained in the classroom, as well as acquire new knowledge about Botany, Zoology, Climatology, Geography, Geology and other disciplines, which in its turn contributes to a deeper understanding of the

complex processes of nature and forms a responsible attitude towards the environment.

While exploring the ecological trail, students gain firsthand knowledge about ecosystems, natural features, and ecological processes and phenomena. The guided excursion along the ecological trail integrates environmental education, recreational engagement and aesthetic education. This integrated approach enhances information perception and retention through participants' positive emotional experiences during the activity [7].

Ecological trails contribute to the formation of practical wilderness skills. Through such trails learners gain practical knowledge about the natural processes and patterns of the environment, which in turn develops a high sense of responsibility towards the environment.

One of the main objectives of ecological trails is to facilitate scientific research. They enable students to carry out studies ranging from the simplest field observations to more complex, professional-level research. Research can be conducted within the framework of various professional courses (“Geography”, “Fundamentals of Nature Studies and Ecology”, “Tourism and the Environment”, “Organization of Ecotourism”). Conducting such research allows students to form and develop their analytical, critical and research skills. By conducting research, students also learn to comprehensively evaluate the results of their research and predict the environmental consequences of human activity [8]. In addition, research allows them to identify local environmental problems and solve them in their own way [9].

Therefore, it is important to emphasize that the key characteristic of ecological training and education through ecological trails is that the learning process does not depend on traditional didactic conditions. Rather, it occurs in a natural setting, driven by the spontaneous acquisition of information and behavioral standards [10].

***The Educational Significance of the Ecological Trail at Yerevan Botanical Garden.*** The ecological trails developed in the RA play an important role in the process of implementing ecological education. Modern trail construction in Armenia has begun to develop since 2017. Since then, various programs have been implemented making it possible to design, build and equip numerous ecological trails throughout Armenia and Artsakh.

Trails for Change non-governmental organization (hereinafter referred to as NGO) plays an important role in the field of trail construction in Armenia, founded by the American–Armenian Hans Keifer. As the owner of the professional trail construction company “Bellfree Contractors” in Los Angeles, he visited Armenia in 2017 as an international expert, participating in the trail design activities and training the volunteers involved in the program.

To date, this organization, in collaboration with more than 30 organizations, has created 80 hiking and cycling trails throughout Armenia and Artsakh, with a total length of more than 1 000 km.

Another key player in Armenia’s trail-building sector is Transcaucasian Trail NGO, which acts as the Armenian representative of Transcaucasian Trail Association headquartered in Washington, D.C. Transcaucasian Trail is a regional trail network that spans approximately 3 000 km from the Black Sea to the Araks

River. The organization's first and largest project involves the construction and equipment of a hiking trail connecting Armenia's northern border with its southern border in accordance with international standards.

In 2017, through a partnership with Trails for Change NGO, an 85 km multi-day loop trail was built in Dilijan National Park, adhering to international standards. It includes Dilijan–Khachardzan, Parz Lake–Goshavank and Dilijan–Haghartsin trails.

The ecological trail at Yerevan Botanical Garden was also established through the initiative of Trails for Change NGO, which plays a pivotal role in fostering ecological awareness and education within society.

Yerevan Botanical Garden is an institution of scientific, environmental, educational and recreational significance, the main goal of which is the import of highly ornamental and economically valuable plant species from different phytogeographical regions of the planet, the creation of living collections, the discovery of their behavior in new ecological conditions and the introduction of the most adapted species into the landscape of cities and settlements. Yerevan Botanical Garden prioritizes ecological education initiatives and public engagement programs to promote understanding of Armenia's unique biodiversity.

Yerevan Botanical Garden holds significant eco-educational importance for tourism students. Thanks to its convenient location, the garden serves as a unique experiential learning site for professional tourism training programs. Moreover, the garden acts as a platform for research activities, contributing to the development of students' theoretical knowledge and practical skills. Participation in the workshops organized here (such as “Paleobotany Workshop” and “Flower Cultivation Workshop”) will enable students to conduct individual or group research projects by applying the theoretical knowledge obtained.

Botanical Garden is also considered a practicum site for future tourism professionals. By completing practicums here, students will not only acquire professional knowledge but also develop new tourism products, gain experience in conducting excursions and learn to organize green events. The development of students' ecological skills is fostered not only by the educational programs and workshops organized in the park, but also by the ecological trail of the garden.

Yerevan Botanical Garden Trail is a 1.5 km long equipped ecological trail, where visitors can get acquainted with the biodiversity of Yerevan Botanical Garden. The trail is circular, has two entrances: from Myasnikyan Avenue and Tsarav Aghbyur Street. The duration of the trail is 1 hour. According to the level of difficulty, it is an easy trail. The trail is designed for both walking and cycling.

Fig. 1 below shows the route of the park trail and the main objects and valuable plant species included in the trail.

The ecological trail includes the garden's valuable tree species, alleys and boulevard, expositions representing dendroflora from different regions, plus the Ecoepicenter and the Botanical Museum.

The Ecoepicenter serves as a public and research center. Plants transferred here from their natural habitats are studied from various perspectives. Moreover, being part of the Department of the Conservation of Genetic Resources of the Armenian Flora, the Ecoepicenter acts as an experimental zone for cultivating plants

from seeds and using tissue culture techniques in the laboratories of the department. The focus is primarily on rare and endangered species in these activities.



Fig. 1. Yerevan Botanical Garden Trail:

1. Ecoepicenter;
2. Botanical Museum;
3. Tropical Plants Greenhouse;
4. Linden Alley;
5. Caucasian Zelkova;
6. Honey Locust Alley;
7. Chestnut-Leaved Oak Alley;
8. Caucasian Dendroflora Exposition;
9. Osage Orange Alley;
10. North American Dendroflora Exposition;
11. Common Oak Alley;
12. Horse Chestnut Alley;
13. Euro-Siberian Dendroflora of Exposition;
14. Dawn Redwood;
15. White Poplar Alley;
16. East Asian Dendroflora Exposition;

17. Common Oak Alley; 18. Eastern Cottonwood; 19. Virginian Juniper Grove; 20. Nursery; 21. Maidenhair Tree; 22. Rosarium; 23. Lilac Collection; 24. Armenian Flora Exposition.

The Botanical Museum showcases information about the modern flora of the Republic of Armenia, along with exhibits of fossils, remains and imprints of plants that thrived in past geological periods of the region, ranging from several thousand to 370 mln years old.

In the context of ecological education of future tourism professionals, the Exhibitions of the Caucasus Dendroflora and the Armenian Flora of Yerevan Botanical Garden are of particular importance. This experience equips future tourism professionals – especially tour guides and hiking guides – with specialized knowledge of Armenia’s flora, significantly enhancing their professional qualifications.

To strengthen ecological knowledge and develop professional skills among tourism department students, we propose organizing an extracurricular practical lesson at Yerevan Botanical Garden as part of professional tourism training programs.

In the framework of the extracurricular lesson, students first walk along the trail and get acquainted with the flora of the garden, after which they participate in “EcoQuest”. First, students should be divided into groups and briefed on the quest rules. Each team must then work to correctly answer all questions and complete the assigned tasks in the shortest time possible. The first team to finish will be declared the winner and receive rewards such as complimentary botanical garden entry tickets or professional reference books.

Thus, ecological trails not only significantly enhance students’ ecological knowledge but also play a vital role in their physical and mental development.

Furthermore, they foster essential soft skills, including: problem-solving skills; critical thinking; spatial orientation skills; communication skills; time management skills; teamwork skills.

**Conclusion.** Studies show that ecological trails serve as an effective tool for advancing both ecological education and professional competencies of tourism students. In addition to professional competencies, trails form a number of other skills, such as practical wilderness skills, critical thinking, spatial orientation, problem solving, communication, time management and teamwork skills.

An analysis of Yerevan Botanical Garden’s ecological trail reveals its significant role in enhancing students’ ecological literacy and developing professional competencies.

To enhance the ecological knowledge and develop the professional skills of tourism students, it is proposed to organize a practical workshop – “EcoQuest” at Yerevan Botanical Garden in the framework of tourism professional courses. This workshop will enable students to acquire professional knowledge and practical competencies. It will also foster essential soft skills, including critical thinking, problem-solving, spatial orientation, communication, time management and teamwork skills.

Received 25.03.2025

Reviewed 27.04.2025

Accepted 30.04.2025

## REFERENCES

1. Acharyan H. *Explanatory Dictionary of Modern Armenian Language, Institute of Language named after Hrachya Acharyan*. Yerevan, Publishing House of the Academy of Sciences of the Arm. SSR I (1969), 2763 (in Armenian).
2. Sargsyan J. *Educational Ecological Trails (Methodological Instructions)*. Ministry of Enlightenment of the Arm. SSR. Yerevan, Central Station of Young Nature Lovers (1985), 15 (in Armenian).
3. Volochaev I.S., Trusheva N.A., Napso I.M. *The Role of Ecological Trails in the Development of the Culture of the Population*. Krasnodar (2020), 44–50 (in Russian).
4. Maladaeva O.K., Tsyrendorzhieva T.B. Ecological Trail as a Form of Ecological Education and Optimization of Recreational Activities. *Vestnik of Buryat State University: Biology, Geography* (2010), 45–47 (in Russian).
5. *Walking Green: Ecological Trails for a Greener Tomorrow* (2024).
6. Glazyrina N.L. Organization of Educational Ecological Trails. *Vestnik of Yuzhno-Ural State Humanitarian and Pedagogical University* (2014), 38–49 (in Russian).
7. Beshko N., Ibotova K., Umarchodzaeva U. *Ecological Trails. Methodological Manual for Teachers*. Tashkent (2010), 44 (in Russian).
8. Popova E. Creating an Ecological Trail as a Means of Forming a Culture of the Population and Preserving Rare Protected Species of Flora. *IOP Conf. Ser.: Earth Environ. Sci.* **392** (2019) 012004.  
<https://iopscience.iop.org/article/10.1088/1755-1315/392/1/012004>
9. Evstafiyeva N.S., Velitchenko I.A., et al. Project “Ecological trails” as a Means of Forming Ecological Culture of Schoolchildren, Eco-psychological Studies – 6. *Ecology of Childhood and Psychology of Sustainable Development* (2020), 368–373 (in Russian).
10. Bogucharskaya A.E., Napso I.M. *The Role of Ecological Trails in the Development of Tourism in the Mountain Forests of Adygea*. Krasnodar (2020), 21–23 (in Russian).

Մ. Վ. ՎԱՐԴԱՆՅԱՆ

ԷԿՈԼՈԳԻԱԿԱՆ ԱՐԱՀԵՏՆԵՐԸ ՈՐՊԵՍ ՉԲՈՍԱՇՐՋՈՒԹՅԱՆ  
ԱՊԱԳԱ ՄԱՍՆԱԳԵՏՆԵՐԻ ԷԿՈԼՈԳԻԱԿԱՆ ԿՐԹՈՒԹՅԱՆ ՄԻՋՈՑ

Ա մ փ ո փ ու մ

Հոդվածում քննարկվում է էկոլոգիական արահետների էությունը՝ ներկայացնելով մասնագիտական գրականության մեջ տեղ գտած սահմանումները: Անդրադարձ է կատարվում էկոլոգիական արահետների ստեղծման և օգտագործման հիմնական նպատակներին: Համառոտ ներկայացվում են էկոլոգիական արահետների դասակարգման չափանիշներն ու դրանց ստեղծման առանձնահատկությունները:

Հոդվածում ներկայացվում է նաև էկոլոգիական արահետների կրթական նշանակությունը՝ կարևորելով դրանց դերը սովորողների, մասնավորապես զբոսաշրջության բաժնի ուսանողների մասնագիտական գիտելիքների ձևավորման և հմտությունների կատարելագործման գործում:

Որպես օրինակ վերլուծության է ենթարկվում Երևանի բուսաբանական այգու էկոլոգիական արահետը և ներկայացվում է դրա դերը զբոսաշրջության ապագա մասնագետների էկոլոգիական կոմպետենցիայի ձևավորման գործում: Հոդվածում ներկայացվում է նաև Երևանի բուսաբանական այգում արտալսարանային դասի կազմակերպման առաջարկ, որը միտված է ուսանողների մասնագիտական հմտությունների զարգացմանը:

М. В. ВАРДАНЯН

ЭКОЛОГИЧЕСКИЕ ТРОПЫ КАК СРЕДСТВО ЭКОЛОГИЧЕСКОГО  
ОБРАЗОВАНИЯ БУДУЩИХ СПЕЦИАЛИСТОВ В ОБЛАСТИ ТУРИЗМА

Резюме

В статье рассматривается сущность экологических троп, представлены определения, встречающиеся в профессиональной литературе. Освещены основные цели создания и использования экологических троп. Кратко представлены критерии классификации экологических троп и особенности их создания.

В статье также представлено образовательное значение экологических троп, подчеркивается их роль в формировании профессиональных знаний и совершенствовании навыков учащихся, в частности студентов отдела туризма.

В качестве примера анализируется экологическая тропа Ереванского Ботанического сада и представлена ее роль в формировании экологической компетентности будущих специалистов в области туризма. В статье также представлено предложение по организации внеаудиторного занятия в Ботаническом саду Еревана, направленного на развитие профессиональных навыков студентов.