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Toward Stronger Integration of Education for Sustainable Development Into the Carpathian Convention Activities: Reflection on the Process and Outlook

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The Carpathian Convention is a multilateral environmental agreement focused on nature conservation and sustainable development of the Carpathian Mountain region; its articles cover various thematic and cross-sectional areas. Article 13 of the convention outlines provisions for awareness raising, education, and public participation and is central to integrating education for sustainable development (ESD) into the convention documents and activities. We have been involved in ESD-related processes of the convention since 2007, in line with ESD-related guidance provided by the United Nations, including the 2030 Agenda for Sustainable Development and the recently adopted ESD for 2030 framework of the United Nations Educational, Scientific and Cultural Organization, which highlights the importance of implementing ESD. In this paper, we reflect on the participatory

ESD-related processes of the convention and provide recommendations for further integration of ESD. Our study is based on a review of the convention documents and the results of participatory workshops conducted in 2018–2019. We conclude that interest in ESD is evident among numerous convention actors and stakeholders. We recommend (1) establishing a convention working group or network of experts focused on education and awareness raising and (2) facilitating stronger support for ESD by the convention presidency.

Keywords: mountain region; education; awareness raising; sustainable development; regional agreement.

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Introduction

Sustainable development, both globally and specifically in mountainous areas, is an internationally recognized paradigm (eg UN 1992, 2015; Jansky et al 2002; Maselli 2012). The United Nations (UN) Sustainable Development Goals (SDGs) and associated targets attest to the complexity and interconnected nature of sustainability transformations. Furthermore, they highlight the important role of education in achieving them—in the dedicated SDG 4 and in targets for several other goals (UN 2015). The critical role of education for implementing the UN's 2030 Agenda for Sustainable Development has been reiterated in academic and policy documents (ie Garcia et al 2017; UNESCO 2019). Moreover, how sustainable development is understood and achieved at local, national, and regional levels is subject to negotiation and societal learning (Barth 2016). Education for sustainable development (ESD), highlighted in SDG 4.7 (UN 2015), provides a framework for such societal learning. It advocates both for educational approaches, which facilitate societal transitions toward sustainable livelihoods, and for the use of

sustainability as a learning context to enhance educational praxis (UNESCO 2014; Barth 2016).

The recently adopted United Nations Educational, Scientific and Cultural Organization (UNESCO) global framework on ESD for the period of 2020–2030 (ESD for 2030) builds on the results of the Global Action Programme (GAP) on ESD (UNESCO 2014). It provides guidance for strengthening ESD as a tool for making progress in implementing SDGs (UNESCO 2019). The framework maintains the 5 GAP priority areas to support its comprehensive implementation (policy, education and training, educators, youth, and communities). With respect to policy, it calls for cooperation, highlighting the role of governments (para 3.5, Annex II, UNESCO 2019) and integration of ESD into regional policies (para 5.14, Annex II, UNESCO 2019).

The governments of the countries sharing the Carpathian Mountains (Czech Republic, Hungary, Poland, Romania, Serbia, Slovak Republic, and Ukraine) have agreed to cooperate on nature conservation and sustainable development of the mountains. In 2003, they adopted a multilateral environmental agreement (MEA), following the

experience of the Alpine Convention, the first such MEA for a mountain region (Price 2000). The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) facilitates multistakeholder dialogue and the joint development of strategies, policies, and projects in several thematic and cross-sectional areas. As such, the convention could be considered a mechanism for mutual learning and negotiation with respect to what constitutes sustainable development—and consequently, the implementation of the UN's 2030 agenda—in the Carpathians.

Article 13 of the convention outlines provisions for awareness raising, education, and public participation (Borsa et al 2008). As such, it is central to integrating ESD into the convention documents and activities. Integration of educational topics took place to various degrees from the convention's entry into force in 2006. However, it has received unprecedented attention since Hungary announced ESD was among its priorities during its 2017–2020 presidency of the convention. Although these developments are in line with SDG 4 and related provisions of the UN's 2030 agenda, as well as with UNESCO's ESD for 2030 framework, a longer-term perspective is needed to ensure the outcomes achieved are followed up (Sarabhai et al 2012). It is not clear whether the next presidency (Poland) will continue to focus on ESD.

The authors have actively facilitated and directed the ESD-related processes of the Carpathian Convention since 2007 on behalf of educational, scientific, and governmental institutions in Hungary and Poland, as well as the convention secretariat. We take advantage of this focus issue of *Mountain Research and Development* to reflect on the systematic participatory process of integrating ESD into the convention, with the aim of consolidating its main outcomes and developments to date, and to outline recommendations for the secretariat and the incoming Polish presidency.

The Carpathian Convention and its ESD-related developments

The Carpathian Convention was adopted in 2003 and entered into force in 2006. It is governed by the Conference of the Parties (COP), which constitutes its main decision-making body, and is administered by the secretariat, provided by the United Nations Environment Programme (UNEP), Office in Vienna (Church 2008). The contracting states (parties) are represented by focal points: nominated governmental representatives, usually from the ministries of environment, agriculture, or the equivalent, of each signatory country. The parties take turns in presiding over the convention triennially.

The COP is responsible for adopting protocols and amendments to the convention; deciding on the political direction, the program of work, and the budget; and reviewing implementation. The Implementation Committee and thematic working groups constitute subsidiary bodies, which prepare technical input and advice to support political decisions and the implementation of activities (Church 2008). The convention working groups are composed of the national focal points, or experts nominated by them, and are open to observers (partner organizations, experts, national and international nongovernmental

organizations [NGOs]) and their input. They provide space for the exchange and cocreation of knowledge and recommendations on specific issues covered by the convention (Church 2008).

The convention provisions, outlined in its articles, protocols, COP decisions, and program of work, are implemented through various projects, activities, and initiatives. These are proposed and developed by the partners or the secretariat and carried out by the convention partners representing local, national, and international organizations, including governments, NGOs, and scientific bodies. The secretariat also facilitates exchange and cooperation with actors from other mountain regions and other international organizations and initiatives. Updated information about the official partnerships of the convention, its protocols, and the activities of the working groups is available at the convention website (SCC 2020).

ESD in the Carpathian Convention

Article 13 of the convention, “Awareness raising, education and public participation,” is a cross-sectional article. Its provisions should be embedded in all thematic areas of the convention, in line with the international sustainable development paradigm and documents (UN 1992, 2015). As such, although there is no dedicated working group or protocol on education, the topic has been addressed in existing protocols and several other convention documents (for details, see Appendix S1, *Supplemental material*, <https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1>).

ESD-related developments of the convention include several projects addressing formal and nonformal education. One example is the Move4Nature Initiative, which focused on integrating local natural and cultural heritage into the curriculum of rural schools in Romania (Tóth 2018). Vocational training is also included; for example, sustainable tourism development training for the local population is addressed in several projects (eg Inversini et al 2015). Several initiatives are aimed at creating regional networks, such as the Carpathian Sustainable Learning Network (CASALEN) (Tóth 2018). Moreover, the convention secretariat liaises with the United Nations Economic Commission for Europe (UNECE) Steering Committee on ESD (SC ESD) to coordinate relevant activities (eg UNECE 2016).

An important development with respect to ESD (although not directly aimed at the implementation of Article 13) was the establishment of the Science for the Carpathians (S4C) network in 2008 (Björnsen Gurung et al 2009). The network aims, among others, to define research priorities for the Carpathian region and to link research, policy, and practice. S4C closely cooperates with the convention secretariat, coordinating input from its scientific conference, Forum Carpaticum, to the COP (Björnsen Gurung 2013). Since 2016, ESD sessions and workshops have been organized by the authors during Forum Carpaticum with support from the S4C Executive Committee (Forum Carpaticum 2018; Tóth 2018).

Many ESD-related developments and projects of the secretariat have originated by chance, based on the availability of resources and without a systematic approach or longer-term vision. However, all have been reflected in the respective COP decisions (as outlined in Appendix S1, *Supplemental material*, <https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1>).

D-20-00025.1.S1), and the secretariat has tried to establish links among them to provide continuity in ESD-related implementation of Article 13. Moreover, many relevant initiatives of convention parties, partners, and stakeholders have not been accounted for, unless officially presented at the COP or Implementation Committee meetings. Few secretariat initiatives to collect, share, and coordinate activities among the ESD programs of the Carpathian countries have been successful. The reasons for this include a lack of time and financial resources among the secretariat and stakeholders, as well as a lack of active interest among the parties. In 2017, the topic of education received an unprecedented boost when it was prioritized by the Hungarian government, which took over the convention presidency at the fifth COP meeting.

Prioritization of ESD under the Hungarian presidency

The decision of the Hungarian presidency to designate ESD as one of its priority areas was triggered by a combination of national and international factors. These included the growing awareness of its importance in the Hungarian educational system, as well as other sectors, and the interest of the Hungarian government in the political processes of the Carpathian region.

The former was marked by the acceptance by the Hungarian government of the Concept for Global Responsibility Education in Formal and Non-Formal Education in Hungary (EACEA 2019). ESD competency was introduced into the evaluation criteria system of Hungarian educators in 2017 (Symeonidis 2019) and corresponded to an increasing number of certified ecoschools (Gan et al 2019) and green kindergartens (Varga et al 2017). The Hungarian ecoschool program started in 2000 as a pilot program for the adaptation of the ecoschool initiative of the Environment and School Initiatives network. In 2004, the Ministry of Education and the Ministry of Environment launched the first open call for the official ecoschool title. This consisted of the following criteria: school documents, school organization, operation, education, school specialties, communication, and external cooperation with ESD actors and the local community (Gan et al 2019). In 2019, ecoschools numbered 1003 (about a quarter of all Hungarian schools). The success of the Hungarian ecoschool network, highlighted by UNESCO (2018), motivated the Hungarian government to prioritize ESD during its Carpathian Convention presidency.

Moreover, sustainability is a key value represented in the 2012 constitution of Hungary, with clear references to the relevance of education. ESD has been an integral part of the National Core Curriculum in Hungary since 2012, as well as of several national strategies (eg the national youth strategy and the lifelong learning strategy). Growing awareness of the importance of ESD in other sectors has led the Ministry of Technology and Innovation of Hungary to plan a national sustainability awareness strategy (Infostart 2019).

Other factors that triggered the prioritization of ESD included the willingness of the Hungarian government to support educational cooperation in the Carpathian basin (Lőrinczi 2018), facilitated by the convention, and the interest of UNECE in developing ESD in Hungary (UNECE 2016). This encouraged the focal point of the convention from the Ministry of Agriculture (also responsible for the

environment), with UNECE, UNESCO, and the Ministry of Human Capacities (responsible for education), to integrate ESD into the agenda of the Hungarian presidency of the convention.

The convention secretariat embraced this initiative. It supported the Hungarian team in organizing the first Carpathian ESD Seminar, which took place in April 2019. The seminar brought together ESD experts and actors from many sectors and from all Carpathian countries for the first time. The authors, who took active part in the seminar, tried to gear the discussions toward producing recommendations relevant for the convention.

With this paper, we aim to link the main outcomes of the Carpathian ESD Seminar and the ESD workshop at Forum Carpaticum 2018 with the preceding participatory ESD processes of the convention. In addition, we outline recommendations for the secretariat and the incoming Polish presidency, with the aim of facilitating further integration of ESD into the convention. We tackle this challenge by addressing the following questions:

- How has been ESD integrated into the convention to date?
- How can further integration of ESD be facilitated under the next presidency of the convention?

Methods

We used a mixed methods approach, including literature research and participatory workshops. We examined COP-related documents, available on the convention website, as well as materials from ESD-related projects and S4C documents, looking for the keywords “education” and “capacity building.” The list of reviewed documents is presented in Table 1. Two of the authors have been actively engaged in the ESD-related activities of the convention since 2008. This allowed us to access and select relevant project documents and reflect on the respective activities to formulate the results and recommendations.

We organized 3 participatory workshops during Forum Carpaticum 2018 and the ESD seminar. Information about the workshops and participants is summarized in Table 2. Workshops held at the ESD seminar were co-organized with the ESD experts of the Ministry of Human Capacities and Ministry of Agriculture of Hungary and constituted (1) a workshop focused on the science–policy–practice interface and (2) a concluding discussion of the seminar, with a focus on policy recommendations. A modified format was applied in the latter case because of organizational challenges. Notes were taken during all workshops.

We collected recommendations from the participatory workshops and cross-checked them with the recommendations from the convention documents. We classified the recommendations into 3 categories that we considered a useful: (1) directed at the convention secretariat and focal points and relevant for policy, (2) relevant for S4C and the science–policy–practice interface, and (3) relevant for practice, project implementation, and management. Moreover, we extracted additional recommendations from the documents. These were identified as important during a joint reflection, based on their perceived relevance for the convention and the integration of ESD in its activities, as well as on informal

TABLE 1 Carpathian Convention–related documents reviewed.

| Event or initiative | Documents reviewed |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COP1, 11–13 Dec 06 | COP1 decisions Secretariat note on cross-cutting issues, including awareness raising, education, and public participation |
| COP2, 17–19 Jun 08 | COP2 decisions Progress report on the implementation of the convention Meeting report–workshop: “The possibilities of Carpathian cooperation in the field of ESD” and the CASELEN <i>Handbook on the Carpathian Convention</i> , prepared by the Regional Environmental Center for Central and Eastern Europe and the European Academy Bolzano, Apr 07 <i>A Heightened Perspective: Regional Assessment of the Policy, Legislative and Institutional Frameworks Implementing the Carpathian Convention</i> , prepared by the Regional Environmental Center for Central and Eastern Europe and the European Academy Bolzano with the support of national experts, Dec 07 (Regional Assessment 2007) |
| COP3, 25–27 May 11 | COP3 decisions Progress report by the interim secretariat Protocol on Sustainable Forest Management to the Carpathian Convention Protocol on Sustainable Tourism to the Carpathian Convention |
| COP4, 23–26 Sep 14 | COP4 decisions Progress report by the interim secretariat Strategic Agenda on Adaptation to Climate Change in the Carpathian Region Strategy for the Sustainable Tourism Development of the Carpathians Protocol on Sustainable Transport to the Carpathian Convention COP4 side events program Evaluation of the UNEP project: preliminary findings Presentation: “Know your. . . Carpathians. Place-based learning a useful tool for education and awareness raising in the Carpathians,” Jana Urbancikova, Bílé Karpaty Education and Information Centre Memorandum of understanding between the Carpathian Convention and S4C Presentation: “Carpathians and Carpathian science addressing the global challenges,” Ľuboš Halada, S4C Presentation: “Science for the Carpathians—developing the network,” Jacek Kozak, S4C |
| COP5, 10–12 Oct 17 | COP5 decisions Progress report by the secretariat Protocol on Sustainable Agricultural and Rural Development Presentation and discussion: “Education for sustainable development in the Carpathians,” Andreas Beckmann, WWF DCP and the convention secretariat Presentation: “A seminar on environmental and sustainable development education and awareness raising in kindergartens and schools,” Attila Varga on behalf of the incoming Hungarian presidency Email feedback received from Andreas Beckmann, WWF DCP, following COP5 |
| ESD-related documents | Move4Nature project report Carpathian Mountain ESD Training Tool Kit Proceedings of the final conference of the project “Big foot: Crossing generations, crossing mountains,” 5–6 Jun 13, Vienna, Austria |
| S4C-related documents | Proceedings of the successive Forum Carpathicum conferences (2010–2018) <i>Research Agenda for the Carpathians 2010–2015</i> (Kozak et al 2011) <i>The Carpathians: Integrating Nature and Society Towards Sustainability</i> (Kozak et al 2013) |

Note: COP1, first meeting of the COP to the Carpathian Convention; COP2, second meeting of the COP to the Carpathian Convention; COP3, third meeting of the COP to the Carpathian Convention; COP4, fourth meeting of the COP to the Carpathian Convention; COP5, fifth meeting of the COP to the Carpathian Convention; CASELEN, Carpathian Sustainability Education Network; WWF, World Wildlife Fund; DCP, Danube–Carpathian Programme.

feedback received from participants during the stakeholder workshops.

The process: milestones and main messages

Table 3 provides an overview of the systematic participatory process of ESD integration into the Carpathian Convention, including developments related to the S4C network. We indicate which outcomes were reflected in COP decisions (see Appendix S1, *Supplemental material*, <https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1>), as well as which role, if any, the authors played in the respective developments.

The recommendations received from the participatory workshops relevant for policy and the science–policy–practice interface are summarized in Table 4. We also list convention documents, where we found references to similar recommendations (in the Source column), and indicate recommendations added by the authors, with reference to the specific documents on which these are based.

Reflection on ESD in the Carpathian Convention

Our overview of different actors’ contributions to strengthening the integration of ESD into the convention activities shows interest in ESD among the convention

TABLE 2 Participatory stakeholder workshops conducted.

| Details | Workshop name | | |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Education for Science & Society in the Carpathians | The Role and Competences of Educators for Sustainable Development in the Carpathians | Steps Toward Regional Collaboration in ESD |
| Date | 16 Oct 18 | 18 Apr 19 | |
| Occasion | 5th Forum Carpaticum, 15–18 Oct, Eger, Hungary | Carpathian Convention Seminar on ESD, 16–18 Apr 19, Budapest | |
| Participants (approximate number) | Scientists, convention secretariat, ministerial bodies, students, and pedagogues from all Carpathian countries | Teachers, educators, representatives of NGOs and the government, and scientists involved in ESD from all Carpathian countries | |
| | (25) | (18) | (56) |
| Format | Several brief statements from invited panel speakers, followed by participatory discussion using a fishbowl format World cafe (20- to 25-minute interval discussions at each table), followed by results summarized by each table host (the authors) and plenary discussion | Introductory presentation, followed by world cafe (20-minute interval discussions at each table), followed by results summarized by each table host (2 authors and a colleague) and plenary discussion | Modified world cafe: participants stayed at the same tables throughout the workshop, and one common question was discussed at all tables; the results of the discussion were summarized by the organizers |
| Main questions addressed | What are the main challenges for facilitating sustainability transformations via education (ESD)? What good examples of participatory/transdisciplinary education projects exist in the Carpathians? What recommendations can we provide to the Carpathian Convention for the most effective actions in this field? ^{a)} | Which competences are the most important for you in teaching ESD? What type of barriers do you face in implementing ESD? What could the solution be? ^{a)} In what way can science, especially educational science, support you in implementing ESD? ^{a)} | Which steps should be taken to support regional collaboration in ESD in the Carpathians? ^{a)} |

Source: Compiled by the authors.

^{a)} Questions, answers to which were considered in answering the second research question.

stakeholders. Although the authors initiated and steered many activities, several fundamental documents contain references to ESD independent of the authors' contribution (ie the convention text, its protocols, and other documents, as indicated in Appendix S1, *Supplemental material*, <https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1>). The Hungarian presidency's decision to prioritize ESD based on its national developments, including its ecoschool network, and its interest in facilitating regional educational initiatives and promoting its achievements internationally show its support for ESD.

The Carpathian ESD Seminar, initiated by the Hungarian actors, demonstrated commitment to ESD among actors and experts from ministries, NGOs, and academia in every Carpathian country. It also pointed to the importance of (1) leadership by governmental experts, (2) integration of the focal points of the convention into ESD-related processes, (3) availability of funds to support participation of experts and actors from all Carpathian countries, and (4) cooperation among the convention focal points, the secretariat, and the S4C network.

However, previous attempts to mobilize focal points from all Carpathian countries to facilitate and coordinate ESD-

related activities had not been successful, even though several COP decisions called for such coordination. This points to the importance of leadership on behalf of the convention parties. Understanding the motivation for this and facilitating the leadership required are among the tasks of the secretariat. This could benefit from further implementation-oriented research and a strengthened science-policy-practice interface. This could be achieved via further cooperation of the secretariat with the S4C network.

In the case of Hungary, the Hungarian government considers that cooperation within the convention could benefit countries beyond the Carpathian ecoregion. So far, the ESD process of the convention has reinforced the ongoing educational processes throughout Hungary and supported dialogue between Hungarian scientists and their colleagues in other Carpathian countries. The natural systems and economic and social developments in the Carpathian Mountains constitute an integral part of the wider systems functioning within and beyond the Carpathian countries (Bjørnsen Gurung et al 2009, 2012). Thus, it is important that the parties can see the potential of the convention-related activities to benefit sustainability transformations at a national level. At the same time, the

TABLE 3 The Carpathian Convention and Science for the Carpathians processes related to education for sustainable development, actors, and outcomes. (Table extended on next page.)

| Date | Activity | Main Carpathian Convention–related actors |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| May 03 | Carpathian Convention adopted and signed | Convention parties and UNEP |
| Jan 06 | Carpathian Convention entered into force | Convention parties and SCC |
| Nov 07 | First meeting of CASALEN | Education experts from Czech Republic, Slovakia, Poland, Ukraine, Hungary, and Austria (Ministry of Education) |
| Jun 08 | First meeting of Carpathian ESD experts at COP2 | SCC, ESD experts from Carpathian countries, CASALEN, REC, and ENSI Romanian actors: Ministry of Education Research and Innovation, school inspectorates, WWF, other NGOs, and protected area staff |
| 2008–2009 | Project: Move4Nature Donor: Move & Help, international corporate social responsibility initiative of the Austrian Mineral Oil Administration | |
| Sep 10 | Forum Carpaticum 1: Integrating Nature and Society Towards Sustainability | S4C, other scientists from the Carpathian countries and abroad, research institutes, international experts, SCC, and NGOs |
| Jan 11 | RCE Vienna established | SCC |
| May 11 | ESD side event at COP3 | Ministry of Education Research and Innovation of Romania and SCC |
| 2011–2013 | Project: “Big foot: Crossing generations, crossing mountains” Donor: European Commission | SCC, European Association of Elected Representatives from Mountain Areas, and indirectly, Carpathian Network of Protected Areas |
| May–Jun 12 | Forum Carpaticum 2: From Data to Knowledge, from Knowledge to Action | S4C, other scientists from the Carpathian countries and abroad, research institutes, international experts, SCC, and NGOs |
| Apr 14 | 9th UNECE SC ESD meeting | SCC and UNECE SC ESD secretariat |

TABLE 3 Extended. (First part of Table 3 on previous page.) (Table continued on next page.)

| Date | Main ESD-related outcomes (indication of outcomes reflected in COP decisions) | Role of the authors |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| May 03 | Article 13, "Awareness raising, education, and public participation," became part of the convention | None |
| Jan 06 | | None |
| Nov 07 | CASALEN established to exchange information and practices and to find common project possibilities; active until 2010 ESD activities suggested in schools, field centers, higher education, and communication Report communicated to the convention by the Austrian Ministry of Education (reflected in decision COP2/10/3) | AV participated in the meeting and became a member of CASALEN |
| Jun 08 | Move4Nature project initiated (contribution of REC and ENSI reflected in decision COP2/10/2) | TM organized and moderated the meeting on behalf of SCC AV participated in the meeting |
| 2008–2009 | ESD network (CASALEN with project partners and experts) working on a common project Teacher training workshops conducted for teachers from rural schools in several counties of Romania Raising awareness about the convention Creating partnerships among schools, protected areas, and environmental NGOs Integrating local cultural and natural heritage into the school curriculum First Carpathian teaching materials produced Romanian version distributed to schools English version, adapted to the wider Carpathian region, placed on the convention website (reflected in decisions COP3/9/1, COP3/9/2, and COP4/9/5) | TM coordinated the project development and implementation on behalf of SCC AV participated in the project on behalf of CASALEN and ENSI in 2014 |
| Sep 10 | "Research agenda for the Carpathians 2010–2015" mentioned inter- and transdisciplinarity and the importance of capacity building in sustainability science Book: Kozak et al 2013 (no direct reference to education, but evidence of Carpathian educational institutions involved in addressing regional challenges) | None |
| Jan 11 | UNEP Vienna–SCC became a partner of RCE Vienna, with the aim to promote similar developments in the Carpathian countries (reflected in decision COP4/9/5) | TM coordinated SCC participation |
| May 11 | Move4Nature project results presented Expert from the Ministry of Education Research and Innovation of Romanian ministry met and discussed potential synergies with experts and focal points from the Ministry of Environment of Romania | TM co-organized the side event |
| 2011–2013 | Transferability Tool Kit produced and edited by SCC, focused on linking intergenerational learning and sustainable development in rural mountainous areas, and available on the convention website (reflected in decision COP4/9/1) Final Conference: Intergenerational Learning for Sustainable Development, organized by SCC, produced policy recommendations Community Livelihood Platform made available online for convention stakeholders (reflected in decision COP4/9/3) Raised awareness of the Carpathian Network of Protected Areas on enhancing local educational activities of protected areas | TM codeveloped the project and coordinated participation of SCC and integration of the project results into the convention |
| May–Jun 12 | Memorandum with the interim SCC mentions collaboration on information exchange, knowledge transfer, capacity building, project development and implementation, and the science–policy interface | None |
| Apr 14 | Informal meeting with the participating Carpathian focal points from Ukraine and Poland, focused on cooperation on ESD in the Carpathian region and potential of establishing a Carpathian Regional Network on ESD (reflected in decisions COP4/9/6 and COP4/9/7) | TM co-organized the meeting with Carpathian focal points |

TABLE 3 Continued. (First part of Table 3 on pp A6–A7.) (Table extended on next page.)

| Date | Activity | Main Carpathian Convention–related actors |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 2013–2014 | Coordination of educational activities with the UNIDO | SCC and UNIDO |
| Sep 14 | Forum Carpaticum 3: Local Responses to Global Challenges | S4C, other scientists from the Carpathian countries and abroad, research institutes, international experts, SCC, and NGOs |
| Sep 14 | Educational provisions in several strategic documents | SCC, WG on Sustainable Tourism, WG on Sustainable Forest Management, WG on Adaptation to Climate Change, and convention parties |
| Sep 14 | ESD-related side events at COP4 | SCC, ACUNS, and convention partners from Czech Republic, Poland, Romania, and Ukraine |
| 2012–2015 | Project: InRuTou Donor: European Commission | SCC and convention partners from Poland, Romania, and Ukraine |
| Jun 15 | 10th UNECE SC ESD meeting, informal meeting of the Carpathian focal points | SCC, UNECE SC ESD secretariat, and Carpathian participants from Czech Republic, Hungary, Poland, Slovakia, and Ukraine |
| Sep 16 | Forum Carpaticum 4: Future of the Carpathians: Smart, Sustainable, Inclusive | S4C, other scientists from the Carpathian countries and abroad, research institutes, international experts, SCC, and NGOs |
| 2016 | Draft report summarizing convention activities related to ESD and the convention countries' reports to the UNECE SC ESD from 2015 | SCC, UNECE SC ESD focal points from Hungary and Slovakia, and InRuTou project partner from Ukraine |
| 2017 | Hungarian presidency designates ESD as one of its priority areas | Hungarian convention focal points and experts of the Ministry of Agriculture and Ministry of Human Capacities of Hungary |
| Oct 17 | ESD consultation during COP5 | SCC, WWF DCP, and Hungarian Institute for Educational Research and Development on behalf of the Hungarian presidency |

TABLE 3 Extended, continued. (First part of Table 3 on pp A6–A7.) (Table continued on next page.)

| Date | Main ESD-related outcomes (indication of outcomes reflected in COP decisions) | Role of the authors |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 2013–2014 | Coordination of SCC with UNIDO on the potential integration of training of young entrepreneurs in the Carpathian region in sustainable and green entrepreneurship (reflected in decision COP4/9/10) | TM maintained dialogue with UNIDO |
| Sep 14 | Thematic session “Smart mountains I,” included several ESD-related presentations | AV and TM co-organized the ESD session; AV moderated the session |
| Sep 14 | Education provisions included: Strategy for the sustainable tourism development of the Carpathians Strategic action plan for the implementation of the forest protocol Strategic agenda on adaptation to climate change in the Carpathian region (for details, see Appendix S1, <i>Supplemental material</i> , https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1) | None |
| Sep 14 | Awareness and participation of youth and local communities in sustainable development, co-organized by SCC and ACUNS InRuTou in the Carpathians and other mountain areas, co-organized by the Carpathian InRuTou partners and SCC Know your Carpathians—learning to value, and share, organized by Bílé Karpaty Education and Information Centre, Czech Republic Carpathians and Carpathian science addressing the global challenges, organized by S4C | TM co-organized the first 2 events with ACUNS and InRuTou partners |
| 2012–2015 | Vocational educational training developed and implemented in Poland, Romania, and Ukraine (on community-based sustainable tourism in rural mountainous regions), online training materials <i>Transferability Manual</i> , edited by SCC, available in print and on the convention website Networking event, organized by SCC in June 2015, produced ESD-related recommendations Project inspired follow-up training in rural tourism and ecotourism, led by a Hungarian organization (reflected in decisions COP4/9/2, COP4/9/3, and COP5/14/4) | TM codeveloped the project with convention partners and coordinated participation of SCC and integration of the project results into the convention |
| Jun 15 | Carpathian UNECE SC ESD focal points expressed interest to cooperate with the convention focal points via an informal network on ESD, as well as to use the occasions of the subsequent steering committee meetings to coordinate Carpathian activities Participants agreed that the first activity of the network would be production of a report on ESD in the Carpathians to serve as the basis for further joint activities (reflected in decision COP5/14/3) | TM co-organized and moderated the meeting AV participated in the meeting as the Hungarian focal point |
| Sep 16 | Session on ESD | AV and TM co-organized the ESD session AV moderated the session |
| 2016 | Carpathian process reflected in the UNECE SC ESD best practice publication (UNECE 2016) Report, drafted by SCC, with input from UNECE SC ESD focal points from Hungary and Slovakia, and convention actors from Ukraine, not approved by the convention focal points as a formal document because of their lack of involvement in the production | TM drafted the report AV provided input into the report as the Hungarian focal point |
| 2017 | (reflected in decision COP5/19) | AV involved as an expert advising the Hungarian convention focal point |
| Oct 17 | Official proposal by Hungary to organize an educational seminar, presented by the Hungarian Institute for Educational Research and Development Recommendations provided by WWF DCP in coordination with SCC as a result of the participatory consultation process | TM coordinated with WWF AV participated as a presenter on behalf of Hungary |

TABLE 3 Continued. (First part of Table 3 on pp A6–A7.) (Table extended on next page.)

| Date | Activity | Main Carpathian Convention–related actors |
|--------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oct 17 | Educational provisions of the agriculture protocol | SCC, WG on Agriculture and Rural Development, and convention parties |
| Oct 18 | Forum Carpaticum 5: Adapting to Environmental and Social Risk in the Carpathian Mountain Region | S4C, other scientists from the Carpathian countries and abroad, research institutes, international experts, SCC, and NGOs |
| Apr 19 | Carpathian ESD Seminar | Ministry of Human Capacities of Hungary; Ministry of Agriculture of Hungary; convention and UNECE SC ESD focal points from Hungary; ESD ministerial experts, practitioners, teachers, and NGOs from all Carpathian countries; SCC; and S4C |
| Apr 19 | Participatory exercise during the Carpathian Convention by the WG on Biodiversity | WG on Biodiversity members, observers, SCC, and S4C |
| Feb 20 | ESD-related input into the 6th Forum Carpaticum ^{a)} | S4C and SCC |

example of Hungary points to the importance of highlighting successful pilot activities (such as the ecoschool network) on the national level, which could motivate leadership on behalf of governments.

Challenges and possible pathways for ESD integration into the convention

Education has been defined by UN and other international bodies as a key tool to achieve sustainable development for at least 3 decades. Therefore, it is worth reflecting on why it is still a struggle to strengthen ESD's position in international processes dealing with sustainable development, such as the convention. Based on our experience, we consider several challenges for stronger coordination and integration of ESD into the convention and propose possible pathways to overcome them in Table 5.

Other conventions also face challenges with respect to integration of ESD into their activities. Sarabhai et al (2012) analyzed educational agendas of the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification. They pointed out to the need to link CBD and UNFCCC more closely to the ESD process to support their implementation.

International ESD-related processes, such as UNESCO's ESD for 2030 framework, can play an important role in maintaining the interest of the governments in ESD issues, but coordinated efforts, "a paradigm shift towards a systems approach" (Bjørnsen Gurung et al 2012: 54), and institutional leadership and competences for transformative

education (Balsiger et al 2017) are needed to raise awareness and resources that support implementation.

Recommendations

The importance of further coordination of activities related to ESD within the convention is evident from the process to date and the recommendations of the Carpathian experts and stakeholders. Moreover, it resonates in the provisions of UNESCO's ESD framework. We recommend focusing on the following steps:

- Providing information and support to the convention focal points, especially the rotating convention presidency, to ensure continuous prioritization of education-related activities within the convention. This would benefit from the continuous engagement of an ESD expert (staff member or consultant) on behalf of the secretariat.
- Clearly outlining the links and identifying synergies between convention ESD activities with the process of reaching the SDGs in general and SDG 4 in particular, as well as education-related activities specified under the CBD (ie its Communication, Education and Public Awareness program) and UNFCCC (ie its developments on climate change education).
- Establishing a convention working group or network of experts to coordinate ESD-related activities outlined in Tables 4 and 5, link them with other thematic areas of the convention, and support intersectoral and transdisciplinary cooperation on the national level (ie between ministries of education and convention focal points) and among the Carpathian countries.

TABLE 3 Extended, continued. (First part of Table 3 on pp A6–A7.)

| Date | Main ESD-related outcomes (indication of outcomes reflected in COP decisions) | Role of the authors |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Oct 17 | Well-elaborated educational provisions included in Article 1, para 3, and in Article 16, “Promotion of formal and informal education of the Protocol on Sustainable Agriculture and Rural Development to the convention” (for details, see Appendix S1, <i>Supplemental material</i> , https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1) | None |
| Oct 18 | Importance of transdisciplinary approaches highlighted by several keynote speakers ESD-dedicated session and workshop—inclusion of ESD-focused research into Forum Carpaticum meetings ESD-related recommendations communicated to SCC | All authors participated in organizing the forum and ESD session and workshop |
| Apr 19 | First multistakeholder meeting focused on ESD in the Carpathians and involving participants from all Carpathian countries Exchange of knowledge and best practices Participants expressed motivation to meet regularly ESD-related recommendations produced in the field of practice, science, and policy, as well as the science–policy–practice interface | TM supported Hungarian ministerial focal points in co-organizing the seminar JZ and TM co-organized a workshop |
| Apr 19 | Exchange and coproduction of knowledge between S4C and WG participants Precedent established for a stronger science–policy–practice interface | JZ and TM co-organized the exercise |
| Feb 20 | ESD session and workshop planned as a follow-up to the Carpathian ESD Seminar Interest expressed by ESD experts from Leuphana University Luneburg to attend Forum Carpaticum and support the convention ESD process with research; keynote speaker on ESD (from Leuphana) invited and confirmed | JZ and TM provided input TM coordinated communication with Leuphana |

Source: Compiled by the authors based on their experience and examined documents.

Note: SCC, Secretariat of the Carpathian Convention; AV, Attila Varga; COP2, second meeting of the COP to the Carpathian Convention; REC, Regional Environment Center; ENSI, Environment and School Initiatives; TM, Tamara Mitrofanenko; WWF, World Wide Fund for Nature, Danube-Carpathian Programme; RCE, Regional Centre for Expertise in ESD; COP3, third meeting of the COP to the Carpathian Convention; UNIDO, United Nations Industrial Development Organization; WG, working group; COP4, fourth meeting of the COP to the Carpathian Convention; ACUNS, Academic Council on the United Nations System; InRuTou, Innovation in Rural Tourism; COP5, fifth meeting of the COP to the Carpathian Convention; DCP, Danube–Carpathian Programme; JZ, Joanna Zawiejska.

^{a)} The Forum Carpaticum was planned for June 2020 but has been postponed to June 2021 because of the COVID-19 pandemic.

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within the convention, which we reflect in this paper. We also thank both reviewers, Lydia Kater-Wettstädt and Georg Gratzner, for their helpful and constructive remarks in an open review process. Open access funding has been provided by BOKU Vienna Open Access Publishing Fund. Attila Varga's work was supported by the ELTE Thematic Excellence Programme 2020 funded by the National Research, Development and Innovation Office (TKP2020-IKA-05).

TABLE 4 Education for sustainable development–related recommendations to the Carpathian Convention. (Table continued on next page.)

| Recommendations | Source: W1–W3, previous documents, and authors' reflections |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Directed at the Secretariat of the Carpathian Convention and focal points and relevant for policy | |
| Facilitate organization of Carpathian ESD seminars annually or biennially | W3 |
| Continue to integrate discussions and regional exchange on ESD into the COPs of the convention and S4C events, such as FC | W3, ESD session at COP5 2017, ESD session at FC 2016, draft ESD report 2016 |
| Enhance communication among convention focal points, ministries of education and other ministries (eg Ministry of Regional Development), and international bodies such as UNESCO and UNECE SC ESD | W1, ESD session at COP5 2017, ESD session at FC 2016, draft ESD report 2016 |
| Establish a way to integrate new findings from the convention into curricula of schools, higher educational institutions, and vocational training | W1, draft ESD report 2016, InRuTou project networking event 2015 |
| Approach funding programs and donors to discuss elaboration of specific funding programs and calls, focused on ESD and transdisciplinary learning for sustainability transformations in the Carpathian region | W3 |

TABLE 4 Continued. (First part of Table 4 on previous page.)

| Recommendations | Source: W1–W3, previous documents, and authors' reflections |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Promote cooperation with other mountain regions in the field of ESD | W1, draft ESD report 2016 |
| Facilitate the establishment of a working group (or an equivalent regional expert network) on ESD under the convention; working group tasks: Facilitating continuous regional exchange on ESD and exchange with experts from outside the region Supporting development of joint projects and other forms of collaboration Coordinating communication with donors Potentially developing a respective protocol Facilitating exchange with other working groups to ensure relevant thematic input into educational materials and initiatives, and vice versa | W1, W3; importance of a regional network also mentioned in CASALEN report 2007, draft ESD report 2016 |
| Relevant for S4C and the science–policy–practice interface | |
| Accompany the ESD process in the Carpathians with continuous research, including encouraging researchers (from the Carpathian region and beyond) in the following: Work on evaluating ESD initiatives in the Carpathian countries Cocreate recommendations with practitioners and policymakers to facilitate sustainability transformations in the region Compare curricula and its implementation throughout the education systems | W1, W2, W3 |
| Enhance communication between the convention stakeholders and the (S4C) science community, including involving ministerial officials from the ministries of education and environment in research, to facilitate integration of the best practices on the policy level | W1, W2, ESD session at COP5 2017, draft ESD report 2016, <i>Handbook on the Carpathian Convention</i> , 2007 |
| Develop a Carpathian summer school, master's program, and doctoral school in sustainable mountain development | W1 |
| Linking science to the classroom, including the following: Involving teachers and students in research Supporting citizen science initiatives, with a focus on developing scientific inquiry competences among teachers and students Reporting scientific findings back to teachers and students and improving mutual communication | W2, citizen science mentioned in the ESD session at COP5 2017, InRuTou networking event 2015 |
| Use and promotion of local, indigenous, and traditional knowledge and its incorporation into ESD to support preservation of cultural heritage, biodiversity, development of sustainable tourism and agriculture, etc | Authors, based on the ESD session at COP5 2017, draft ESD report 2016 |
| Promote universities to become role models for participatory governance through the implementation of transdisciplinary case-based teaching projects | Authors, based on FC 2018 |
| Relevant for practice, project implementation, and management | |
| Coordinate or build a database with information about ongoing ESD projects in the Carpathians | W1 |
| Emphasize the importance of the Carpathians and help adapt curricula to the future needs of the Carpathian region | W1 |
| Give preference to long-term ESD projects, with regular reflection and adaptation based on realities of implementation in the countries | W2 |
| Promote projects focused on teacher education for ESD | W1, W2, UNEP/Carpathian Convention/decision COP1/13 2007, Regional Assessment 2007 |
| Require scientific assessments of all ESD-related projects in the Carpathians | W1 |
| Embed an ESD component into all convention initiatives and projects by integrating social learning and participatory reflection into the activities | Authors, based on draft ESD report 2016 |
| Promote initiatives to train civil servants to develop intersectoral ESD programs within the state sector | Authors, based on proceedings of FC 2018, ESD session at COP5 2017, Regional Assessment 2007 |

Source: Compiled by the authors based on the recommendations received from the workshop participants. The additional recommendations, including those based on authors' reflections, are marked as "Authors," and the documents on which these additional recommendations were based, are indicated.

Note: W1, Education for Science & Society in the Carpathians; W2, The Role and Competences of Educators for Sustainable Development in the Carpathians; W3, Steps Toward Regional Collaboration in ESD; FC, Forum Carpathicum; COP5, fifth meeting of the COP to the Carpathian Convention; InRuTou, Innovation in Rural Tourism.

TABLE 5 Challenges and pathways for integrating education for sustainable development into the Carpathian Convention.

| Challenge | Potential pathway to address the challenge |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Lack of awareness among many focal points about the cross-sectional nature of ESD and the contribution it can provide to the implementation of other convention activities (biodiversity, climate change, sustainable tourism, agriculture, etc), as well as national obligations with respect to other international frameworks and conventions, including CBD, UNFCCC, and the 2030 Agenda for Sustainable Development; this partly results from the following:</p> <p>Lack of understanding that ESD encompasses a societal learning process beyond school curricula and is strongly related to the bottom-up or grassroots initiative, ownership, and success of sustainability transformations, such as the implementation of SDGs (UNESCO 2019)</p> <p>General political indifference to facilitating ESD in the Carpathian countries (Barton and Dlouhá 2014)</p> | <p>The secretariat, in cooperation with partners, such as S4C, should enhance communication and awareness-raising efforts targeting the convention focal points on the linkages between ESD and other international frameworks and convention activities.</p> <p>Use of participatory research methods, such as a focus group discussions, with the convention focal points should be further explored.</p> <p>Better coordination should be developed between the ESD-related activities of the secretariat and those implemented by convention parties and partners in the Carpathian countries (eg Hungarian ecoschool programs).</p> |
| <p>Lack of commitment among the focal points, potentially resulting from the following:</p> <p>Lack of time (and reluctance to take on additional priorities, which may indicate additional workload)</p> <p>Lack of awareness (as described earlier)</p> <p>Lack of readily available resources</p> | <p>ESD-related activities should be integrated into projects and initiatives focused on other thematic areas of the convention, such as the implementation of the education-related provisions of the agriculture protocol and strategic documents on sustainable tourism, forestry, and climate change (for details, see Appendix S1, <i>Supplemental material</i>, https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1).</p> <p>The secretariat should continue fundraising for activities focused on ESD.</p> |
| <p>Lack of coordination and exchange between ministries and staff responsible for ESD and those responsible for the implementation of the convention on the national level:</p> | <p>The secretariat should continue efforts to link convention focal points with their counterparts focused on ESD in each Carpathian country, taking into account the specific national context, for example, by suggesting specific tasks for collaboration of the respective officials or ministerial experts.</p> <p>Specific tasks for the focal points could include projects and initiatives using the convention to support implementation of the ESD for 2030 framework, SDG 4 and other education-related targets of the 2030 agenda, and education provisions in other international mechanisms, such as CBD and UNFCCC.</p> |
| <p>Low prioritization of ESD among academic and governmental institutions in the Carpathian countries</p> <p>Slow development of inter- and transdisciplinary approaches</p> <p>Poor integration of ESD into S4C activities, until it was facilitated by the authors in 2016 (Björnsen Gurung et al 2009; Tóth 2018) because of the lack of educational experts in the S4C network, preventing communication of ESD-related recommendations to the secretariat and focal points to support respective decision-making</p> <p>Underdeveloped practice of communicating research results to the decision makers in the Carpathian countries later (Barton and Dlouhá 2014)</p> | <p>This challenge has been addressed by the secretariat, in cooperation with the S4C, and facilitated by the authors since 2015.</p> <p>Continuous further efforts are needed to strengthen the integration of ESD into S4C activities and strengthen transdisciplinary approaches and the science–policy–practice interface in Carpathian educational institutions.</p> <p>Efforts should be made to include ESD experts and teachers in S4C and convention activities.</p> <p>The secretariat, in cooperation with S4C and the convention focal points, should develop communication and cooperation with respective ministries of education and science regarding the inclusion of ESD themes as priorities in school curricula, teacher education, and research projects.</p> |

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Supplemental material

APPENDIX S1 Text related to education for sustainable development in the Carpathian Convention Conference of the Parties decisions and other convention documents.

Found at <https://doi.org/10.1659/MRD-JOURNAL-D-20-00025.1.S1>.