

Youth Participation in UNESCO Biosphere Reserves: A Scoping Review

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Abstract

Social-ecological systems have steadily evolved from expert-led management towards community involvement. In line with the upcoming engagement of youth as a separate stakeholder group within the UNESCO Man and the Biosphere Program, this scoping literature review provides an overview of studies currently existing in regard to youth within UNESCO biosphere reserves. By using a sequential and qualitative selection procedure, an analysis is made of the involvement of youth within UNESCO biosphere reserves. Hereby theoretical backgrounds and methodological approaches are clustered, and recommendations for future inquiry are made. Seven articles were selected for full-text in-depth analysis. In line with specific youth definitions and delineations found within the selected articles, most studies do not include high levels of participation in biosphere reserve research or praxis. Results show that it is considered essential to create a structured multi-method research plan adopting an adaptive research approach throughout the process of data collection and integrate a system theory approach to include all relevant contextual factors. The literature review concludes that there exists a research gap of youth within the UNESCO biosphere reserves framework. Thus, the recommendation is made for the explicit inclusion of the essential aspect of youth as explicitly stated and separate entities within future biosphere reserve research.

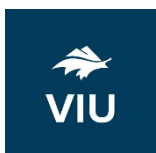
Keywords

Biosphere Reserve; Youth; Participation; Scoping Review.

1. Introduction

Youth as a valuable community asset is often overlooked when it comes to social-ecological system management. Whereas expert-led management of ecosystems has steadily evolved towards community involvement in social-ecological systems (Berkes, 2004), it is hypothesized that current literature does not explicitly distinguish youth as separate stakeholders within the conservation and development perspective of social-ecological systems. However, in line with international engagements such as the UNESCO MAB program, literature and praxis is moving towards a more holistic approach in the recognition and involvement of youth in social-ecological system management.

In 1971 the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched the Man and Biosphere Program (UNESCO, 2017c). This intergovernmental scientific program aims to establish a scientific basis for the improvement of relationships between people and their environment (UNESCO, 1996). By establishing a World Network of Biosphere Reserves, the Man and Biosphere Program aims at promoting solutions reconciling the conservation of biodiversity with its sustainable use (Ishwaran, Persin, & Tri, 2008; UNESCO, 2008, 2017d). Since the Seville Strategy (UNESCO, 1996) was developed, each biosphere reserve can be seen as a 'science for sustainability support site' in order to test interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity (UNESCO, 2017a, 2017b). Biosphere reserves are characterized by



three interrelated zones which aim to fulfil three complementary and mutually reinforcing functions. Whereas the core area(s) comprises a strictly protected ecosystem, a surrounding buffer zone includes and encourages development activities comprising scientific research, monitoring, training, and education (Ishwaran, Persin, & Tri, 2008). Thereafter, a transition area allows even more invasive activities like fostering economic and human development that is socio-culturally and ecologically sustainable (Ishwaran, Persin, & Tri, 2008).

Within the UNESCO Man and the Biosphere Program, youth as a separate stakeholder group is a key engagement. Youth can be identified as the age cohort between children and adults. However, composing an unambiguous definition of this rather familiar concept is complex. Whereas the UN Convention on the Rights of the Child describes a child as being under the age of 18 (UN, 1989), the UN, through their World Programme of Action for Youth, adopts a statistical definition of youth as persons between the age of 15-24 (UN, 2010). Hereby, it is stated that definitions have changed continuously in response to fluctuating political, economic, and socio-cultural circumstances of Member States (UN, 2010). Furthermore, several UN entities adopt alternative age ranges (Karkara, Ragan, & Solberg, 2012). UNESCO follows the UN age boundary of 15-24 (UNESCO, 2019). They state this definition to be flexible, context specific and fluid, as “the experience of being young can vary substantially across the world, between countries and regions” (UNESCO, 2019). In the context of biosphere reserves, the MAB strategy document only refers three times to the concepts of youth and young people, without giving a clear definition of both terms (UNESCO, 2017d).

The level of participation of youth in research and praxis is considered relevant as literature suggests that youth participation through for example participatory action research, both as research method and intervention, allows for the enhancement of youth empowerment and development (Kim, 2016). Levels of stakeholder participation (including youth) within the scope of biosphere reserves are based on an adapted version of Arnstein’s ladder of participation, used in Roldan, Duit, and Schultz (2019). Four different, sequential levels are indicated: (1) information; the degree to which the Biosphere Reserve informs and consults local actors about its activities, (2) implementation; the participation of local stakeholders in day-to-day management and monitoring efforts, (3) involvement; the degree to which stakeholders partake in setting the goals for the BR, and (4) representation; if local stakeholders are being represented in the BR’s steering committee or board. Participatory action research in specific is considered to be not defined by the methods used within the selected studies, but by the relationship between the researcher(s) and the participants (Newing, Eagle, Puri, & Watson, 2011). Three types of participation are identified, delineating this relationship: (1) adult-driven, (2) youth-adult partnership, (3) youth-driven research (Kim, 2016; Newing et al., 2011). Furthermore, an evolution toward a more innovative approach called ‘Youth-led Participatory Action Research’ (YPAR) can be noted. This approach focusses on youth empowerment and incorporates a range of methods to engage youth in sharing their perspective, i.e., empowering the voices of youth (Kim, 2016; McRuer & Zethelius, 2017). The involvement of youth within such collaborative research approaches is however not frequently reported (Powers & Tiffany, 2006).

2. Materials and Methods

This article provides insights into both research and praxis of youth within UNESCO biosphere reserves. It clarifies the research designs and research methods used to analyze the involvement of youth within UNESCO biosphere reserve research. Scoping review as a type of knowledge synthesis is acknowledged to be a methodology ideal to examine the extent, range, and nature, identify literature gaps, and summarize findings from knowledge that is methodologically heterogenous (Arksey & O’Malley, 2005; Pham et al., 2014; Tricco et al., 2018). Hence, the research undertaken as part of this scoping literature review addressed three key questions:

1. What is the conceptual and theoretical background of existing research of youth stakeholders within UNESCO biosphere reserves?
2. What are the methodological approaches taken and which empirical research methods were put into practice?
3. What are recommendations made for future research regarding youth stakeholders?

A scoping literature review regarding youth involvement within UNESCO biosphere reserve research is considered essential before conducting in-depth case studies and creating guidelines for future innovative approaches. Therefore, the hypothesis of this review is as followed: ‘Youth is an underrepresented group of stakeholders within the research context of stakeholder participation in UNESCO biosphere reserve research’. We envision the need for a holistic in-depth research of youth involvement in biosphere reserve management. Hence, this scoping literature review is considered a background analysis for future academic research regarding youth as biosphere reserve research and management stakeholders.

Focusing on the broad concept of youth, this article aims to provide knowledge about their involvement as stakeholders within the international framework of UNESCO biosphere reserves. For the purposes of the literature review, all ethnicities and geographical scopes were included in the review, and no initial distinction was made on the basis of methodology. As part of these different boundaries and in line with the explorational objective of this literature review, no predetermined age-related delineation was set on the concept of ‘youth’ or

‘young people’. On the contrary, to analyze the similarities and differences of definitions used within the selected articles, it was considered to be of specific value to this scoping literature review. Hence, the review focuses on all youth stakeholders throughout all biosphere reserves.

The literature search was conducted from November 2019 until the end of January 2020 and followed a stringent search and analysis strategy. With youth as stakeholders within UNESCO biosphere reserves as its focus of inquiry, and due to the global acknowledgment and use of the terms ‘youth’ and ‘young people’, no other synonyms or related terms were used. Based on those inclusion criteria, the following keywords and search combination for the literature search were derived:

["Biosphere Reserve*" AND (Youth OR "Young People*")]

This search combination was used in two databases, i.e., Web of Science and Limo. First, Web of Science was consulted using the search combination ‘ALL’ field tag, which includes for example title and topic. Next, Limo was consulted using two extra rigorous criteria, (1) source type: article; (2) search area: the term ‘biosphere reserve*’ within article keywords and the term ‘youth OR young people’ within full document, to narrow search results.

Following this, each body of literature from the search process was analyzed in a sequential and qualitative way (see Figure 1). A brief checklist of quality criteria was developed to determine the quality and appropriateness of the information: (1) Is the reference a study within or related to one or multiple biosphere reserves recognized by the UNESCO MAB program, and (2) does the study include and/or focusses on youth/young people? If it was possible to answer both questions with ‘yes’, a full review of the literature item was carried out provided the full text was available. Only those articles which have come through the quality assessment, have been fully reviewed.

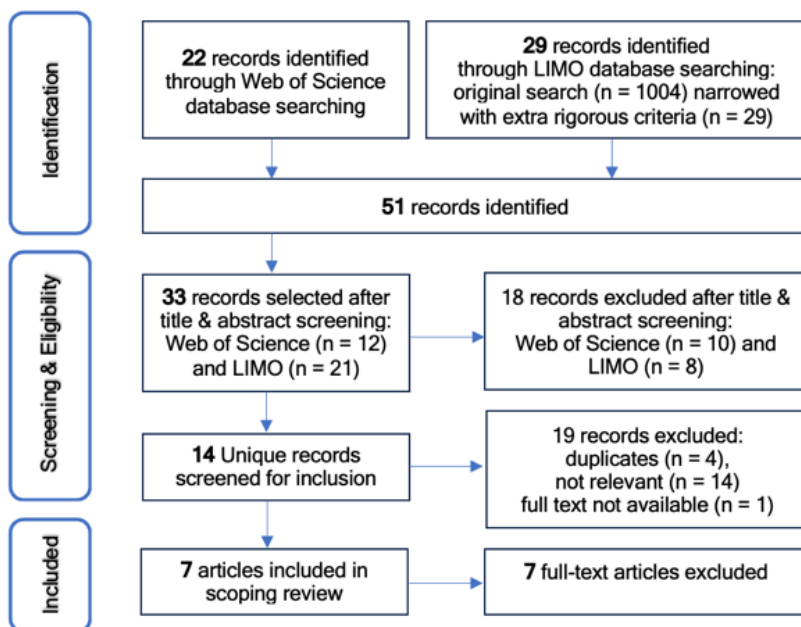


Figure 1. PRYSMA flowchart of study selection process.

4. Results

Using Web of Science and LIMO to survey academic literature on youth participation in Biosphere Reserves, subject to the rigorous quality checklist, resulted in a total of 7 unique records included in this review. Table 1 provides an overview of the selected papers that deliver useful information to address the three key questions of this research: the conceptual and theoretical background of existing research of youth stakeholders within UNESCO biosphere reserves; the methodological approach taken, and empirical research methods put into practice; the recommendations made for future research regarding youth stakeholders. Moreover, it summarizes relevant information and content of the selected articles, including (1) geographical scope, (2) overall objectives and research aim, (3) data collection methods, and a clear distinction between (4) research executors and respondents. Thereafter, Table 2 indicates the levels of participation in research and practice, which will be explained further.

Table 1. Included articles regarding youth within UNESCO biosphere reserve research.

Article reference	Geographical scope	Overall objectives & Research aims	Data collection methods	Executor (E) & Respondents (R)
Mendis-Millard and Reed (2007)	Clayoquot Sound BR & Redberry Lake BR - Canada	Overall objective: To engage biosphere reserve volunteer board members and general residents in determining the kinds, characteristics, and accessibility of local natural, social, economic, and human capital available to assist local people. Specific aim: - To assess how community-based research can effectively, and even help build, community capacity and inform the concept of ecosystem management.	- Semi structured in-depth interviews, focus groups, workshops	[E] Researchers [R] Local residents (e.g. youth)
Sylvester et al. (2016)	La Amistad BR - Costa Rica	Overall objective: To examine culturally specific relationships with wild food, the extent and frequency of wild food use in forests, and young people's wild food consumption. Specific aims: - To gather information regarding (1) hunting and consuming wild meat, (2) harvesting and consuming wild plant foods, (3) wild resource sharing, and (4) gendered and generational harvesting [surveys]; - To gather information related to interviewees' engagement in wild food harvesting, consumption, and food sharing [interviews]; - To extend understanding of young people's food consumption focusing on interactive activities related to Bribri food, including story telling by Elders, a show-and-tell about wild food [traditional food workshop & photography exposition].	- Participant observation, interviews, focus group discussions, household surveys & a traditional food workshop	[E] Researchers [R] Local residents e.g. youth; Specific focus on high school youth during traditional food workshops.
Mammadova (2017)	Mount Hakusan BR - Japan	Overall objective: To assess the site-specific elements that links biological and cultural diversity of the region. Specific aims: - To assess intensive teaching activities, e.g. in-class activities for theoretical and methodological tools - To assess five fieldtrip activities.	- Informal interviews (during each course) - Post-fieldtrip-survey-reports - Post-activity-feedback, awareness & knowledge-survey (considered very basic)	[E] Academic students [R] Local villagers [E] Researchers [R] Academic students (n=21) [E] Researchers [R] Academic students (n=21)
Sedano et al. (2018)	the Urdaibai BR - Spain	Overall Objective: To study the effectiveness of activities carried out outside the school which boost pupils' motivation and promote concept learning. Specific aims: - The acquisition of information about the Basque youth's attitude towards nature; - The assessment of the effectiveness in promoting interest in nature of visiting the Ekoetxea Interpretive Center.	- Pre-visit-survey & Post-visit-survey	[E] Researchers and Secondary School students

Mammadova (2019)	Volzhsko-kamsky BR, Baykalskiy BR & Far East Marine BR – Russia Mount Hakusan BR – Japan	<p>Overall objectives: To evaluate the changes in students' knowledge, attitude, and skills towards each other's culture, after intercultural exchange and learning. - To examine how well BRs can be effective to increase intercultural competence in youth. Specific aims: - To evaluate the intercultural competence elements like attitudes/awareness, knowledge, and skills on culture of each country</p>	<p>- Post-course-survey-reports [R] Japanese & Russian students</p>
Mitrofanenko et al. (2018)	Salzburger Lungau & Kärntner Nockberge BR Austria	<p>Overall objective: - To examine the motivations and barriers for participation of the youth and elderly women in processes and activities related to the implementation of the biosphere reserve. They hereby consider the potential for applying intergenerational practice (IP) as a means to increase their involvement. Specific aims: - Individual inter-views and focus groups - Background analysis of existing reports, BR-websites, and participatory events What are the perceptions of the biosphere reserve among the elderly women and youth, as well as the obstacles to and motivations for them to engage in biosphere reserve-related activities? What are the elderly and younger residents' perceptions of the other generation and intergenerational practice? Are the biosphere reserve managers aware of the potential held by the involvement of youth and elderly, and to which extent are they familiar with IP?</p>	<p>- Semi-structured interviews - Face-to-face interviews - World Café - Individual inter-views and focus groups - Background analysis of existing reports, BR-websites, and participatory events [E] Researchers [R] young residents [E] Researchers [R] school classes [E] Researchers [R] Elderly women [E] Researchers</p>
Grasser et al. (2016)	Grosses Walsertal BR – Austria	<p>Overall objective: To identify present methodological details of participatory approaches in ethnobiological research. Specific aims: To document the diversity of wild plant species gathered by local people with state-of-the-art interdisciplinary methods; To highlight the close link between biodiversity and local culture; To actively support various local initiatives concerning the sustainable conservation of biodiversity and biosphere management by involving these actors in the research process and disseminating the results.</p>	<p>Phase 1: Freelist interviews & participant observation Phase 2: school workshops structured questionnaires Phase 3: Two 5-day participatory video workshops Phase 4 (evaluation): Semi-structured questionnaires/survey Participant observation Phase 1: [E] First author [R] Local people Phase 2: [E] First Author [R] Students [E] Students/children [R] family members Phase 3: [E] Co-production children-researchers Phase 4 (evaluation): [R] Children interviewed local experts Phase 4: [E] Researchers [R] Children who took part in the video workshop (n=10) [E] Researchers [R] Children</p>

4.1. Geographical Scope

A geographical scope (see Table 1) that is (partly) labelled as biosphere reserves recognized by UNESCO was one of the quality criteria developed to determine the quality and appropriateness of the selected studies. Hence, all studies were conducted within a relatively similar administrative and internationally recognized status, i.e., a biosphere reserve. Nonetheless, these reserves still include a variety of terrestrial, marine, and coastal ecosystems (UNESCO, 2017b), management approaches, levels of community-involvement and levels of development. Moreover, each reserve is divided into a core zone, a buffer area, and a transition zone. Further in-depth analysis of those varieties and zones was not considered relevant in regard to the formulated research questions.

Results show ten different biosphere reserves across six different countries and three continents. Three out of the seven studies included multiple biosphere reserves as geographical scope in their research approach. Notably is the fact that one study, Mammadova (2019), was partly conducted in multiple acknowledged biosphere reserves. Other National Parks and one Nature Park were also part of their geographical scope. A biosphere reserve as geographical scope was not a fundamental element during their research.

4.2. Overall objectives and research aim in relation to youth delineation

An analysis of research objectives and aims in relation to youth delineation presupposes the inclusion of a youth definition or at least descriptive statement. In total, five out of seven articles define their youth participants as students. Sedano, Ortuzar, and Diez (2018) use Primary Education and Secondary School students as sample group. Mammadova (2017) focuses on educating youth, defined as students in general. In her intercultural education and exchange program, Mammadova (2019) examines Japanese and Russian students. Grasser, Schunko, and Vogl (2016) use the terms students and children to define their respondents. At last, Mendis-Millard and Reed (2007) and Sylvester, Segura, and Davidson-Hunt (2016) focus on local residents, including their implicit notion of youth. Hereby, Sylvester et al. (2016) targeted high school youth during the workshops. Yet, none of these studies include a clear exclusive and exhaustive outline of what these concepts include.

Only one out of the seven articles (Mitrofanenko, Snajdr, Muhar, Penker, and Schauppenlehner-Kloyber, 2018), includes an analysis of youth definitions in their article. Via their synthesis, they define youth participants as “20 years old and younger” and emphasize this adopted definition is used in intergenerational literature and is compatible with the official Austrian definition of youth as aged between 14 and 19 years (Mitrofanenko et al., 2018, p. 433).

In regard to the relation between adopted research designs (see Table 1) and multiple youth delineations, a wide variety in objectives and levels of participation and management competence can be found. Firstly, with the global loss of biodiversity as a starting point, Sedano et al. (2018) consider environmental education as a widely demanded and fundamental element to improve the situation of the ecosystems of the world. Therefore, their research assesses the efficiency of environmental education programs within a Spanish biosphere reserve, viewing young people, defined as students, as survey participants. Next, survey respondents were household heads in the study of Sylvester et al. (2016). Therefore, they indicate the possibility of misrepresented data in regard to younger generations. Although younger household members volunteered to respond to survey questions 26 percent of the time and some were present when surveys with adults were carried out, supplement surveys with other methods, e.g., individual interviews and discussions during a traditional food workshop, were necessary to ensure the representation of youth’s views. The authors argue that youth’s participation defined as research respondents, turned out to be crucial in order to understand the many factors that shape access and availability of wild food, including relationships with non-human beings, health, work, school and time constraints, and/or access to rifles or dogs, enabling them to triangulate their data as well as to enrich the understanding of short responses provided in their household surveys (Sylvester et al., 2016).

Another notable research approach can be found in the study of Mammadova (2019). In partnership with relevant stakeholder organizations, she created educational programs for Russian and Japanese students to evaluate the intercultural competence through learning of each other culture and nature inside the biosphere reserves. Mammadova (2019) conducted cross-cultural inbound courses to Japan for 14 Russian students and outbound courses to Russia for 50 Japanese students, by using the biosphere reserves as a platform to increase their intercultural competencies. The course objectives consisted of; (1) understanding the diverse cultural and natural differences of each country, (2) increasing the communication, creativity, and decision-making skills between Russian and Japanese students during BR’s natural activities, (3) learning about Human-Nature-Culture Interaction, and (4) using that knowledge for the regional revitalization of each country (Mammadova, 2019).

Notably is the research objective of Mitrofanenko et al. (2018). These authors examined the motivations and barriers for participation of both youth and elderly women in processes and activities related to the implementation of biosphere reserves. The Intergenerational practice (IP) approach was applied as a means to increase

their involvement. This approach brings young and old age groups together in order to build more cohesive communities (Mitrofanenko et al., 2018).

4.2. Data collection methods

Five of the seven selected articles (Grasser et al., 2016; Mammadova, 2017; Mendis-Millard & Reed, 2007; Mitrofanenko et al., 2018; Sylvester et al., 2016) used multiple research methods to gather data. The remaining two (Mammadova, 2019; Sedano et al., 2018) only used surveys as they conducted research within the context of educational programs. In total, seven different research methods were found: questionnaire (Grasser et al., 2016), World Café (Mitrofanenko et al., 2018), survey (Mammadova, 2017, 2019; Sedano et al., 2018; Sylvester et al., 2016), participant observation (Grasser et al., 2016; Sylvester et al., 2016), workshops (Grasser et al., 2016; Mendis-Millard & Reed, 2007; Sylvester et al., 2016), focus group (Mendis-Millard & Reed, 2007; Mitrofanenko et al., 2018; Sylvester et al., 2016), and interview methods (Grasser et al., 2016; Mammadova, 2017; Mendis-Millard & Reed, 2007; Mitrofanenko et al., 2018; Sylvester et al., 2016). Note that both survey and questionnaire are considered different research methods. Represented analysis adopted the terms used in the referred studies. However, no definition of both survey and questionnaire was given within these studies. Therefore, the possibility of overlapping methods cannot be excluded.

In Mendis-Millard and Reed (2007), the concept of adaptive research methods appeared. This approach emphasizes the importance of flexible academic research and researchers themselves. Mendis-Millard and Reed (2007) observed that conducting community-based research combined with an adaptive approach require researchers to monitor their work constantly and to be sensitive to many research stakeholders on a regular basis throughout the process. Moreover, by stating funding agencies to be typically seeking research questions where outcomes are predictable rather than emergent, Mendis-Millard and Reed (2007) argue that it may prove difficult to promote this approach.

Although they don't quote the term adaptive research methods, also Sylvester et al. (2016) emphasize the value of being flexible throughout the research process:

We did not plan to conduct a workshop on traditional food consumption but did so at our colleagues' recommendation. As our research illustrates, developing these methods can be context specific. At the same time, we found it helpful to start with general tools to gather information about wild foods (e.g., household surveys) and to modify these tools based on the advice of our research colleagues. (Sylvester et al., 2016, p. 459)

Throughout the use of sequential data collection methods, multiple authors argue it to be crucial to adopt a reflexive research practice (Mendis-Millard & Reed, 2007; Mitrofanenko et al., 2018; Sylvester et al., 2016). This approach refers to critical reflection throughout the research process that helps "sensitize the researchers to the cultural, social, political, and economic contexts of the research and to acknowledge multiple possible interpretations of the findings" (Mendis-Millard & Reed, 2007, p. 547).

Finally, a significant difference regarding the written conscious considerations in the choice of research methods is found between the study of Mitrofanenko et al. (2018) and all other selected articles. While most authors give a brief description of the chosen research method(s), the article of Mitrofanenko et al. (2018) gives a deeper and more specific explanation of the sequential selection procedure of research methods. Thereby, they include an overview (see Table 2, page 434 in Mitrofanenko et al., 2018) representing the interviewees. Moreover, they refer to other authors during their research method disquisition, indicating the conscious considerations during selection procedures.

4.3. Research Executors and respondents

Each empirical study in this literature review includes both research executors (i.e., the person(s) responsible for data collection) and respondents (i.e., the person(s) who provide raw data to be analyzed). An ad verbum overview of all research executors and respondents is outlined in Table 1. In line with the overview of, and separations between research executors and respondents, it is considered relevant to analyze levels of participation in academic research and biosphere reserve practice within the selected studies. This turned out to be crucial in order to understand adopted definitions of youth. Although not explicitly stated in the selected studies, the level of research participation and the embraced level of youth stakeholder participation in biosphere reserves was analyzed during literature analysis. Based on the levels of participation as stated by Kim (2016), Newing et al. (2011) and Roldan, Duit, and Schultz (2019),

Table 2 gives an overview of the levels of participation in both research and biosphere reserve praxis. Based on Kim (2016), the level of participation in biosphere reserve research, comprises (1) adult-driven research, (2) youth-adult partnership, and (3) youth-driven research. Based on Roldan et al. (2019), the level of stakeholder participation in biosphere reserve praxis encompasses (0) missing data; no implicit or explicit indication can be found, (1) information; the biosphere reserve informs and consults local actors about its activities, (2) implementation; the participation of local stakeholders in day-to-day management and monitoring efforts, (3)

involvement; stakeholders partake in setting the goals for the biosphere reserve, and (4) representation; stakeholders are being represented in the biosphere reserves steering committee or board.

Table 2. Levels of Youth Participation in Biosphere Reserve Research and Praxis.

	Level of participation in research (based on Kim, 2016)	Level of participation in praxis (based on Roldan et al., 2019)
Mendis-Millard and Reed (2007)	Youth-adult partnership	Involvement
Sylvester et al. (2016)	Adult-driven research	Information
Mammadova (2017)	Youth-adult partnership	Missing data
Sedano et al. (2018)	Adult-driven research	Missing data
Mammadova (2019)	Adult-driven research	Missing data
Mitrofanenko et al. (2018)	Adult-driven research	Implementation
Grasser et al. (2016)	Youth-adult partnership	Missing data

4.3.1. Levels of youth's research participation

Notably, only the studies of Mammadova (2017) and Grasser et al. (2016) included research methods in which young people adopted the role of executor. Academic students in the study of Mammadova (2017) only conducted informal interviews with local villagers as part of their own education program. Also, in Grasser et al. (2016), the "children" only partially adopted a researcher role when they interviewed local experts during participatory video workshops.

4.3.1. Levels of youth's stakeholder participation

Like stated above, only Mitrofanenko et al. (2018) specifically focus on defining youth as biosphere reserve stakeholders. Moreover, they argue that although stakeholder participation is considered of high importance in UNESCO biosphere reserves, certain groups, i.e., youth and elderly women, remain underrepresented. Mitrofanenko et al. (2018) hereby support this scoping review's hypothesis. Furthermore, they propose Intergenerational Practice (IP) as a means of involving both youth and elderly women and explore its options and barriers. Their results reveal obstacles and motivations to participating in biosphere reserve implementations and intergenerational activities and imply that much potential for IP exists in the Lungau and Kärntner Nockberge biosphere region in Austria. Hence, suitable solutions from the field of IP are proposed to overcome identified participation obstacles. Benefits of incorporating IP as a management tool into biosphere reserve activities are suggested. These consist of tackling the lack of understanding and information in order to create opportunities to inform youth and elderly about the reserve in general, and local people's potential in specific. Moreover, IP could make benefits visible and address power inequalities and hierarchy, lack of agreement and trust issues. This IP approach can be implemented into biosphere reserve management on several levels, including international, regional, and national levels (Mitrofanenko et al., 2018).

Furthermore, in the context of environmental education, Mammadova (2019) argue that biosphere reserves can be used as platforms to link cultural and biological diversity. They are considered to be helpful to develop new educational methodologies for both youth and other relevant stakeholders (Mammadova, 2019).

5. Discussion

This scoping review was conducted to explore youth participation within biosphere reserve research. The quantity of selected studies (n = 7) pinpoints the current literature gap of youth and young people as a separate stakeholder entity within participatory biosphere reserve research. In line, multiple considerations can be identified as possible review limitations. After the systematic selection procedure, only seven studies passed the selection criteria. Within the context of 701 biosphere reserves in 124 countries, this is considered remarkable. Furthermore, it is even more striking that two of the seven studies have the same author and were partially conducted within the same geographical scope.

A possible cause of this limited search result can be identified in the concept of biosphere reserves as geographical scopes. Like identified during the narrative synthesis, the study of Mammadova (2019) also included multiple areas in the geographical scope, going beyond the context of recognized UNESCO biosphere reserves. Hence, it is considered possible that youth-oriented research mainly adopts a broader or more specific geographical scope.

Despite the possibility of the aforementioned literature review limitations, our results highlight the need for a fundamental, clarified conceptual and theoretical framework of youth participation in biosphere reserve research. With the types of research participation of Kim (2016) and participation ladder of Roldan et al. (2019) in mind, it is clear that full participation, identified as youth-driven research and being represented in the biosphere reserve's steering committee or board, is far from common. Moreover, even if some type of research participation was applicable, a clear exploration remains exceptional, i.e., only three out of seven papers could be analyzed based on the participation ladder of Roldan due to incomplete or lack of information on the contextualization of youth involvement at hand. There is still a lot of progress possible to reach the goal of true youth participatory action research which ensures that research happens with instead of on youth, and practice-oriented approaches decolonize the so-called expert knowledge in order to empower local youth experiences (McRuer & Zethelius, 2017; Newing et al., 2011). A possible explanation can be found within the selected paper of Mendis-Millard and Reed (2007). Despite the success of a research method adaptation during their participatory research, Mendis-Millard and Reed (2007) struggled with tensions between appropriate academic research protocol and conducting community-based research. "Researchers who practice reflexivity, respectfully engage communities, and alter research methods to fit local needs and desires can leave some participants with a sense of empowerment and trust in the ability of research to provide positive outcomes" (Mendis-Millard & Reed, 2007, p. 555). Their experience underlines the importance of adopting both reflective attitudes as researchers and adaptive research methods and research methodology when conducting community-based research. In turn, Mammadova (2017) discusses the missing of prior evaluation of the local villagers before starting fieldtrips. With a main focus on educating the academic students, this research missed out on properly involving local villagers to enhance and deepen their research results. Hence, it is considered essential to create a structured research plan which adopts an adaptive research approach throughout the process of data collection.

In the selected cases, professionals' reports are based on collected data using young people as sample population. As indicated above and seen in Table 2, only two studies took a first modest step towards actively including youth in their research process. Further explorational or case study research might fill this gap. For example, by adopting an intergenerational practice (IP) approach, which has been proposed as one way of enhancing participation of youth (and elderly women) within biosphere reserves (Mitrofanenko et al., 2018). Furthermore, five out of the seven selected articles used multiple research methods. Using multiple methods to collect and analyze data in the context of conservation research from a social science perspective is acknowledged and encouraged in methodological literature (Bryman, 2016; Newing et al., 2011). Hence, it can be concluded that future research towards youth stakeholders within biosphere reserves must adopt a similar multi-method approach. More specific, semi-structured interviews seem to be an overall research method to explore contextual information and collect relevant in-depth data.

In regard to the different geographical scopes, a variety of terrestrial, marine and coastal ecosystems, management approaches, levels of community-involvement and levels of development form study-specific research contexts. Hence, all selected articles could undergo a more in-depth analysis regarding their geographical scope and its relationship with the perceived results. However, this was not considered relevant in regard to the scope of this review and corresponding research questions.

Based on this scoping literature review, further (in-depth) research on youth participation in biosphere reserve research and management is needed. Multiple authors included in this review, support this statement. For example, Mammadova (2019) claim to further evaluate how acquired intercultural skills can contribute to future employment of youth. They hereby retain their approach of youth as sample population. In the context of wild food consumption and access, Sylvester et al. (2016) recommend the need for further in-depth analysis of differences among young people or among members of other social groups. Mitrofanenko et al. (2018) in their turn suggest future research should include in-depth case study examples and evaluate applications of intergenerational practice approach in the context of UNESCO biosphere reserves and other protected areas. Moreover, they consider the testing of methods used in other contexts relevant in the contribution to theory development. In conclusion, all studies suggest further research explicitly involving youth stakeholder. Hence, the review hypothesis regarding youth as an underrepresented group of stakeholders within the context of stakeholder participation in UNESCO biosphere reserve research is supported.

6. Conclusions

This literature review focused on youth as the (under)represented group of stakeholders within the context of stakeholder participation in UNESCO biosphere reserve research. Our hypothesis envisioned the need for a holistic in-depth research of youth involvement in biosphere reserve management. Based on an in-depth review of seven papers, the hypothesis turns out to be valid. First, the conceptual and theoretical background of existing research of youth stakeholders within UNESCO biosphere reserves turns out to be rather limited. Second, the methodological approach taken, and empirical research methods put into practice are mostly adult-driven and youth-driven research was non-existent. Finally, further in-depth theoretical and case study-based research regarding youth stakeholders is recommended.

In regard to the overall objective defined as providing insights into both research and practice of youth within UNESCO biosphere reserves, this modest scoping literature review turns out to have three possible overall conclusions. Either it revealed a huge research gap of scientific research focusing explicitly on youth relevant research stakeholders within the context of UNESCO Biosphere Reserves, or the research and/or geographical scope of this review is too narrow. A comparative analysis between biosphere reserves and other geographical scopes might therefore be interesting. Furthermore, one can question the relevancy of discrepancy between such geographical scopes, as well as the possibility of generalizing results of youth participation in environmental research in general. Further research might elaborate on this.

In conclusion, this scoping literature review is considered an explorational background analysis for future academic fieldwork regarding youth as biosphere reserve management stakeholders. Hence, a more in-depth study including official UNESCO and biosphere reserve documents is considered essential. Collecting relevant studies and documents could hereby think beyond academic databases such as Web of Science and Limo and include both the UNESCO database and actively involving all current biosphere reserve managers in order to collect good-practice, local based studies conducted within their biosphere reserves. Further research can possibly rule out one or multiple of the limitations stated above and can increase both quality and quantity of the scoping literature review regarding youth in UNESCO biosphere reserve research.

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