Impact of Ethnolinguistic Research in Dhofar – A case study

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Abstract

In Dhofar (Oman) and al-Mahra (Yemen) there is a unique ecosystem due largely to annual monsoon winds from the Indian Ocean which are caught by a coastal mountain range. The endemic languages and cultures are closely linked with the local ecosystem. However, due to socioeconomic shift, rapid development, climate change, and the introduction of Arabic as the language of business and education, that link has weakened significantly and the local languages, cultures, and ecosystems are in decline. The population of the region has been using Arabic in the place of the local languages; the cultures are likewise shifting from traditional to modern lifestyles, which along with the language shift has led to a breakdown in communication between the older and younger generations; the ecosystems have been heavily damaged by increased livestock herds, overgrazing, and urbanisation.

Recent research in this region such as the Documentation and Ethnolinguistic Analysis of Modern South Arabian languages (DEAMSA) project has slowed this decline through community involvement in documenting the languages and cultures. Follow-up work including the author's PhD research using and extending DEAMSA's work within the local communities have seen that impact grow.

This paper provides a case study of the impact the research has had in these regions drawing from personal testimony of research collaborators, e-resources developed with DEAMSA material and in collaboration with Dhofaris, a survey exploring Dhofaris' interest in the local flora, and cultural considerations on measurement of impact.

1. Introduction: A brief history of documentation work in Dhofar

In Dhofar (Oman) and al-Mahra (Yemen), a coastal mountain range catches annual monsoon winds from the Indian Ocean resulting in a cloud forest biome. Due to geographic isolation and the unique climate, this region is home to several endemic plants,[1] animals,[2]

[1] Shahina A. Ghazanfar, and Martin Fisher, *Vegetation of the Arabian Peninsula* (Springer Science & Business Media, 1998);

Anthony G. Miller, and Miranda Morris, *Plants of Dhofar: The Southern Region of Oman: Traditional, Economic and Medicinal Uses* (Oman: Office of the Adviser for Conservation of the Environment, 1988).

[2] Janet C. E. Watson, Andrea Boom, and Abdullah Musallam al-Mahri, 'Modern South Arabian: Appraising the Language–Nature Relationship in Dhofar', in *Proceedings of the 47th Annual Meeting of the North Atlantic Conference on Afroasiatic Linguistics (NACAL 47)* (Leeds, accepted 2021).

languages and cultures.[3] The indigenous languages, collectively the Modern South Arabian Languages (MSAL), are all categorised as endangered, that is, falling out of use to varying extents.[4] The two largest MSAL are Mehri, with approximately 200,000 speakers, and Shehret with approximately 40,000 speakers.[5] Traditionally, the Mahra (Mehri-speaking tribes) lived north of the escarpment mountains of Dhofar and al-Mahra in the arid plateau and desert. The Shehret speakers traditionally lived in the monsoon-affected mountains surrounding the Salalah plain (See Figure 1 Map of Dhofar). Today, most speakers have settled into towns and cities, the largest of which is Salalah, Oman to the south of the mountains. Though a proportion of the Mehri-speaking population lives in Yemen, data for this paper is largely taken from Oman due to ongoing conflict in Yemen.

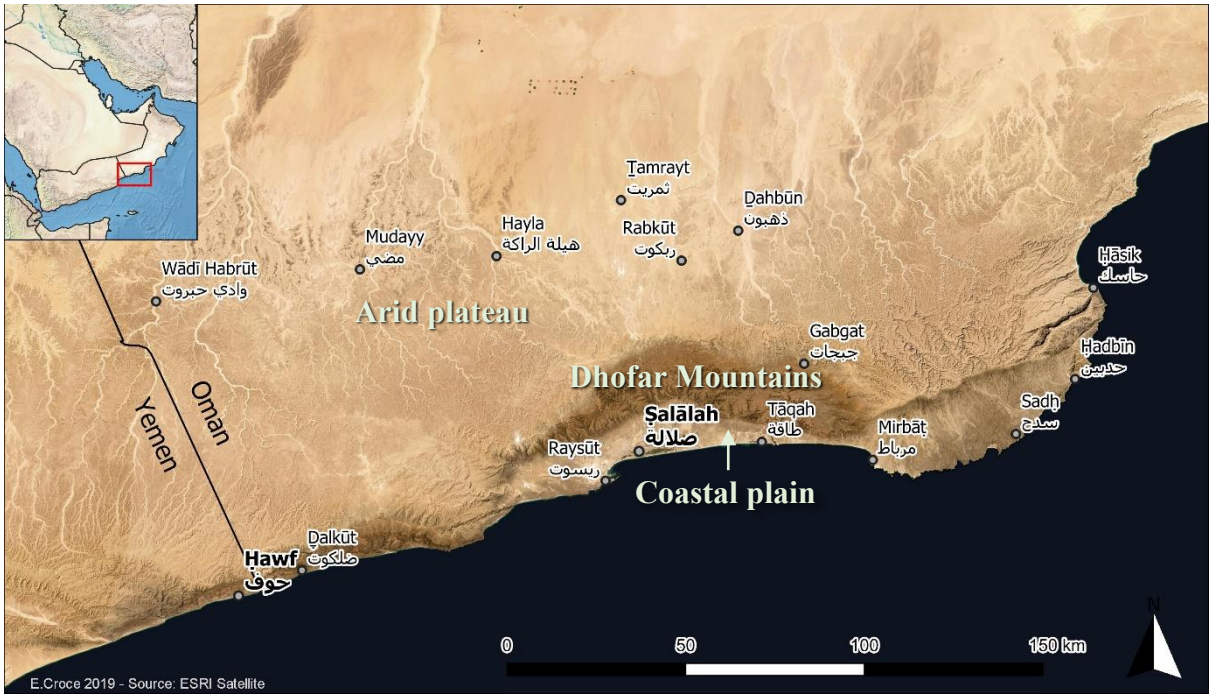

Figure 1 Map of Dhofar

[3] Watson, Boom, al-Mahri.
Marie-Claude Simeone-Senelle. 2011. 'Modern South Arabian.' in Stefan Weninger, Geoggrey Khan, Michael P. Streck and Janet C.E. Watson (eds.), *The Semitic languages: An international handbook* (Walter de Gruyter GmbH: Berlin/Boston).

[4] Janet C. E. Watson, and Abdullah Musallam al-Mahri, 'Developing Resources for Modern South Arabian Languages', in *Communicating Linguistics: Language, Community and Public Engagement*, ed. by Hazel Price and Dan McIntyre (Routledge, 2023), pp. 168-79.

[5] Watson, al-Mahri.

Oman modernised recently and rapidly. Prior to 1970 there were two hospitals in the capital city, Muscat,[6] few schools and a total of six miles of paved road.[7] Today, there are thousands of miles of paved roads, modern healthcare, and schools and universities across the country. These changes largely took place between 1970 and 2000 with development continuing to the present day.[8]

This modernisation has had enormous impact on wellbeing measures such as infant mortality rates which decreased 99.24% from 1972 to 2008.[9] The socioeconomic development has also impacted the local ecosystem; as wealth and stability increased, livestock and human population also increased leading to significant ecological damage.[10] The traditional knowledge has been disappearing as the domains in which it was used have shifted. For example, traditional houses have been replaced with concrete cinderblock houses;[11] traditional water sources, once necessary for survival, have been replaced by indoor plumbing.[12] In much the same way, the indigenous languages are negatively impacted by these changes; as schooling, modern healthcare, and other government services were introduced, Arabic replaced local languages as the language for business, entertainment, and education.[13]

In response to this, documentation projects such as the Documentation and Ethnolinguistic Analysis of Modern South Arabian languages (DEAMSA),[14] and follow-up fieldwork have focused on documenting the traditions and languages. Knowledgeable speakers of local

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[6] Moeness M. al-Shishtawy, 'Four Decades of Progress: Evolution of the Health System in Oman', *Sultan Qaboos University Medical Journal,* 10 (2010), 12-22.

[7] Linda Pappas Funsch, *Oman Reborn: Balancing Tradition and Modernization* (Springer, 2015).

[8] See for example, al-Shishtawy;
World Bank, 'GDP Per Capita (Current US$) - Oman', World Bank Group, (2021) <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=OM> [Accessed 2 Sept 2021];
The Consulate General of the Sultanate of Oman, 'Oman's Booming Healthcare Sector' (2021) <http://oman.org.au/omans-booming-healthcare-sector/> [Accessed 2 Sept 2021].

[9] al-Shishtawy.

[10] Lawrence Ball, Douglas MacMillan, Joseph Tzanopoulos, Andrew Spalton, Hadi al-Hikmani, and Mark Moritz, 'Contemporary Pastoralism in the Dhofar Mountains of Oman', *Human Ecology,* 48 (2020), 267-77.

[11] Watson, Janet C. E., Andrea Boom, Amer al-Kathiri, and Miranda Morris, 'Three Shehret Texts: Building with flora.' in Fabio Gasparini, Kamala Russell and Janet C. E. Watson (eds.), *Language and Nature in Southern Arabia* (Cambridge, 2023).

[12] Saeed al-Mahri, "Traditional water sources in Dhofar." In *Water@Leeds Blog*. https://wateratleeds.wordpress.com/2015/02/18/traditional-water-sources-in-dhofar/: (University of Leeds: 2015)

[13] Watson and al-Mahri.

[14] Janet C.E. Watson, and Miranda Morris, 'Documentation of Modern South Arabian: Mehri', in *Endangered Languages Archive* (http://hdl.handle.net/2196/e1220e3a-459f-4565-bb7c-5a748d01ef97: 2016);
———, 'Documentation of Modern South Arabian: Shehret', in *Endangered Languages Archive* (http://hdl.handle.net/2196/00-0000-0000-000E-D5F2-1: 2016).

languages were recorded describing aspects of life prior to the changes of the 1970s and 80s in their local languages. Topics include vocabulary lists, stories about memorable events, information about landscapes, wind types, and local plants, etc. The archives from the DEAMSA project are housed at the Endangered Languages Archive (https://www.elararchive.org/). Collaborative research has continued in both Dhofar and al-Mahra, and the archives are updated regularly with new material.[15]

Documentation is an important first step. However, for language revitalisation to be successful, language use must be expanded to new domains of use.[16] The changes of the past fifty years created new domains such as schools, hospitals, government agencies, the internet, etc. This is also true for the indigenous knowledge of the region. Some new domains include urban planning, biodiversity conservation, livestock management etc.[17] These domains, however, already include the use of Arabic, so intentional intervention is needed to extend the local languages and traditional knowledge.

This case study examines how arts and humanities research has helped the process of extending the use of the languages and traditional knowledge. The next section discusses data gathering methodologies. §3 provides results and analysis. §4 suggests future projects and conclusions are found in §5.

2. Methodology

Two methodologies were employed and are discussed in the following sections: first, participant observation and second, an online survey. Participant observation demonstrated the impact of the ethnographic research and the online survey provided an opportunity to pursue more specific questions about the previous research and participants' interest in future projects.

[15] Watson and Morris;
[16] Adam Stone, and Erik Anonby, 'Cybercartography in Indigenous Language Education', in *Further Developments in the Theory and Practice of Cybercartography: International Dimensions and Language Mapping*, ed. by DR Fraser Taylor, Erik Anonby and Kumiko Murasugi (Elsevier, 2019), pp. 441-60.
[17] Andrea Boom, 'Small, Green and Prickly: Local Botanical Knowledge in Modern South Arabian Languages', in *34th Deutscher Orientalistentag* (Freie Universitat Berlin: 2022).

Participant observation

Participant observation is a methodology in which the researcher observes and participates in lived experiences of a social group.[18] This experience is recorded in a field journal which is then used in the analysis of the observations.[19] Participant observation data were gathered in Dhofar over several field visits, online collaborations for webinar sessions and conferences, and through personal connection via Zoom and WhatsApp. The findings from this method are described below in §3.

Survey

In addition to participant observation, a survey measuring the impact of research outputs was run from 22 November until 10 December 2022. It was sent to nine personal contacts in Oman and shared through a WhatsApp group of 65 researchers working on language and nature among the MSAL from around the world, approximately 15 of those are Dhofari. Ethical approval (FAHC 21-008) was given 1 October 2021 through the University of Leeds Ethics Committee. The survey included a standard privacy policy and excluded people aged 0-17.

The survey was constructed around a story map built using the ArcGIS online StoryMap tool (https://storymaps.arcgis.com/). The story map is based on information about local plants' names and uses in skin care and is available in English (https://arcg.is/0XSWPH) and Arabic (https://arcg.is/S0XWL). It was written together with Kamela al-Barami and translated into Arabic by Hammal al-Balushi.

The survey is divided into four sections. The first section gathers demographic information, while the second section evaluates participants' botanical knowledge and their involvement in botanical use and conservation. Following this, the survey includes a story map, and the survey closes with questions about participants' future plans related to use and conservation. The justification and goals for each survey section are outlined below.

[18] Fiona Copland, and Angela Creese, 'Data in Linguistic Ethnography', in *Linguistic Ethnography: Collecting, Analysing and Presenting Data*, ed. by Fiona Copland and Angela Creese (55 City Road, London: SAGE Publications Ltd, 2015).

[19] Uta Papen, 'Participant Observation and Field Notes', in *The Routledge Handbook of Linguistic Ethnography*, ed. by Karin Tusting (Routledge, 2019), pp. 141-53.

Demographics

Participants' age, gender, location, tribal affiliation, and language use were collected in the demographic section. This information was compared against participants' knowledge and conservation participation. It was also collected to exclude participants who are underage or who are not from southern Arabia.

The survey was available in Arabic and English which provided greater accessibility for people in Dhofar as Arabic is used more than English. Translating the survey into Mehri and Shehret was considered, but ultimately this would not have expanded the scope enough to warrant the effort. This is because the population that does not know Arabic well enough to complete the survey also cannot read well enough to complete the survey in Mehri or Shehret. Unfortunately, this meant that older, monolingual MSAL speakers were excluded from the survey. In the future, the survey will be run in-person in Mehri and Shehret to include these speakers.

The rapid development that has occurred since the ascension to power of Qaboos bin Said (1970) and the end of the Dhofar War (1963-1975)[20] has led to dramatically different upbringing experiences for young Dhofaris. As such, the survey asked participants which of the following age ranges they fall into:

- 85+ (born before 1937) – these participants would have memory of the pre-Qaboos era and most came of age within the subsistence lifestyles of their ancestors.
- 56-84 (b. 1938-1966) – these participants were children when Qaboos became sultan and were born into subsistence lifestyles. They are expected to have a high degree of ecological knowledge and conversely, less formal education.
- 41-55 (b. 1967-1981) – these participants grew up in a rapidly changing environment. They would have learned some survival skills from their parents who had been dependent on the ecosystem. Arabic education was increasingly common during this period but reportedly not high quality.
- 25-40 (b. 1982-1997) – these participants experienced socioeconomic change during their childhood. Those from nomadic families were either born in a town or moved to a town or city as a child. Most of this generation have some formal education in Arabic.

[20] Watson and al-Mahri.

- 18-25 (b. 1998-2004) – Dhofaris in this age group were born after most of the change had taken place; most families had settled in towns or cities where schooling and healthcare are available.
- 0-17 (b. 2005-2022) – any respondent born between 2005 and 2022 was automatically excluded and provided a link to view the story map. This was done to safeguard vulnerable sectors as at the time of the survey, these people were under 18.

Following this, participants were asked about their comprehension and frequency of use of Mehri and Shehret. Both languages are in danger of falling out of use[21] which could also result in the loss of the local knowledge.[22] By measuring the frequency of the languages' use, we can better target revitalisation efforts. Demographic information was collected to compare against participants' knowledge and use of the local flora.

Botanical knowledge, conservation, and use

Following the demographic section, the survey asked participants to identify three common Dhofari plants from photographs. The goal was to determine the baseline knowledge prior to viewing the story map which identifies the plants in question. The plants were chosen for their usefulness, habitat, and prevalence. All three are used in skincare; each plant comes from a different biome in Dhofar, the coastal plain, the mountains and the plateaux north of the mountains; these plants are recognisable to most people with knowledge of the local flora.

Further questions set a baseline for the participants' use of local flora for food and medicine, and their participation in conservation efforts. These results are compared with the demographic profiles determining who is using and conserving the local flora. This in turn directs future targets for involving wider participation from the community. These results are also compared with information collected following the story map to measure its impact.

Story map

At this stage in the survey there is an embedded version of the story map.

Follow-up

The follow-up section measured the attitude change toward using and conserving local flora after learning some traditional uses. This was done through a series of questions relating

[21] Watson and al-Mahri.
[22] Rodrigo Cámara-Leret, and Jordi Bascompte, 'Language Extinction Triggers the Loss of Unique Medicinal Knowledge', *Proceedings of the National Academy of Sciences,* 118 (2021).

to participants' intention to conserve and/or extend the use of the local flora. These results are compared to baseline information about conservation and use to measure the impact of making information about the plants accessible.

Participants could then provide contact information to be notified when other e-resources are published, other surveys are available, and to volunteer to help build more e-resources. The contact information is held in a separate location to protect participants' identity. The survey results showed interest in the local flora, its uses, and conservation.

3. Results

Arts and humanities research has begun reversing the declining health in the local languages and knowledge. Findings from participant observation and the online survey demonstrate this.

Participant observation

Analysis of the participant observation data looked at whether there is interest in the history and tradition of the region and whether language and knowledge use are expanding into new domains. Evidence for interest in the history and tradition and new domains for language use were found. New domains for knowledge application are not in evidence.

Renewed interest in history and tradition

The impact documentation projects have had in Dhofar is visible in the younger generation joining the research because of a renewed interest in their parents' history. This is observed first through the conversations that precede the recording of stories or information for the archive. While doing recording for this research, the whole family would gather to listen to the conversation and add information as they were able. This allows younger speakers (under 25) to participate even if they do not know enough information to make a recording themselves.

Second, some younger speakers (under 25) are continuing the documentation by recording or writing about their older relatives' history. This is possible in part because the DEAMSA project provided some recording instruments available for use in Oman and training on how to prepare recordings for archiving.[23] Recordings done by local researchers are valuable because Dhofaris can document topics that are of interest to them.

[23] Watson and Morris.

Documentation work done prior to DEAMSA has also inspired renewed interest in the history and tradition of the area. For example, documentation for the book 'Plants of Dhofar'[24] is still having impact today. Today, one of my main Dhofari collaborators is the son of one of the consultants involved in that book. He has continued to research the traditions and lifestyles of his parents' generation and has begun working on his own book on traditional beautification practices, to be published later this year.

The rich history and tradition of Dhofar are still valued by the younger generation. Arts and humanities research has given them a new avenue for learning those traditions and history. The next section describes how language use is similarly affected by arts and humanities research.

Expanded domains for language use

Languages which are falling out of use are described as endangered. When the everyday domains of language use change or disappear, the language becomes endangered unless it expands to new domains.[25]

The DEAMSA project developed an Arabic-based orthography for the MSAL allowing them to expand into domains which require writing. The online messaging app, WhatsApp, has been a natural domain for using the new orthography because it is easily accessible and widely used. For example, Professor Watson uses WhatsaApp to text in the local languages with her Dhofari contacts on a regular basis. Another new domain where the written languages are used is in children's books found online here: https://ahc.leeds.ac.uk/modern-south-arabian-languages/doc/resources-2.

Another extended domain for language use is teaching outsiders the languages. Professor Watson has run language courses together with a Dhofari colleague for four years. This interest in the languages and outsiders using them has raised their perceived value in the region. When Professor Watson meets new people and speaks the local language with them there is often excitement that a foreigner can speak the language.

A third new domain is on social media such as X (formerly Twitter) and YouTube. There are X users who post in Mehri and others who post about Mehri. There are also growing numbers of videos of traditional songs, poems, and chants in Mehri online. Shehret is less represented on social media.

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[24] Miller.
[25] Stone.

These new domains for language use are still small. This adaptation provides hope for the languages' continued use, but further expansion is needed. The DEAMSA project has made these domains possible through the new orthography and valuing traditions and history by recording them. Next steps for expanding language use into more domains are discussed in §4 Future Work.

Expanded domains for knowledge use

Interest in the local knowledge in Dhofar appears to be growing as demonstrated above in the section on Renewed interest in history and tradition and in the survey results below. However, new domains for applying that knowledge are not in evidence today. §4 Future Work discusses some possible domains and strategies for expansion.

Survey results

This section describes the survey data. The first section introduces the participants; the second section describes their knowledge, conservation, and use of the local flora. The final section describes the impact as seen through future intentions to expand use and conservation of the local flora and engage with future e-resources.

Participants

The ten participants of this survey represent geographic diversity and diversity in the languages spoken at homes. There is a heavy gender imbalance, and the age spread is not very wide. Two participants have been excluded from the results because they are in Saudi Arabia, one is American, and neither speak MSAL leaving eight participants included in the results presented here. There are fewer participants than envisioned when the survey was set up, but the results offer insight into the impact of research in the region, nonetheless.

Two participants gave their age range as 41-55 when completing the survey, the rest were born between 1982 and 1997, aged 25-40. The 25-40 years olds tend to have stronger technology and literacy skills which could have been a barrier for older participants. The two respondents over the age of 40 are new contacts and one is from a tribal group that has not yet been involved with DEAMSA or the follow-up fieldwork.

Seven participants are men, one is a woman. Most of the researchers in the WhatsApp group and my personal contacts are men which could partly account for this disparity. The female respondent had similar answers to the other participants in her age group. The one difference is she was the only respondent to decline participation in future surveys or creating

other e-resources which, along with her being the only female participant, could indicate women are less inclined to participate in this type of survey.

All participants included in the results are living in Dhofar. The regions represented are on the coastal plain, on the plateaux north of the mountains, and in the coastal mountains in western Dhofar. These locations encompass many of the biomes of the region (see Figure 1 Map of Dhofar).

Every participant reported comprehension in both Mehri and Shehret. Both languages are widely spoken in the regions represented which could account for this result. Six participants speak Mehri at home and three participants speak Shehret at home – one household is bilingual. The greater number of Mehri speakers could be due to the higher population of Mehri speakers.

Only one household uses both languages at home even though each respondent reports understanding both languages. This is a pattern that is found more widely. One of our consultants, who did not participate in the survey, is a Mehri speaker but spends time each evening with her neighbours who speak Shehret. She understands most of the conversation but does not speak Shehret herself. Conversely, there was a visitor who came to visit a Mehri speaking household but only speaks Shehret and Arabic herself. This pattern of bi- or multi-lingualism is not universal, however. Further away from the main city and in the diaspora, it is far more common that people only understand one MSAL.

Initial botanical knowledge

Age played a role in participants' botanical knowledge, as anticipated. The older two participants labelled all three plants successfully and only one of the six younger participants did so. Botanical knowledge appears to be stronger in Dhofaris born while reliance on the environment was still necessary. Only one participant, a Shehret speaker between the age of 25 and 40, did not label any of the plants; the rest of the participants knew at least one of the three.

Conservation participation

In the next section, participants were asked how often in the past year they had participated in ecological conservation efforts and were then asked whether they wanted to increase their involvement in conservation after viewing the story map.

Conservation participation appears to be linked to botanical knowledge. The three participants who are not already involved in conservation efforts were also the three least able

to label the plants in the earlier section. These three participants indicated they would like to increase their participation in conservation following reading the botanical information in the story map suggesting increasing knowledge could also increase willingness to join conservation efforts.

Five participants were already involved in conservation. This indicates that there is concern for the local ecosystem and awareness of the declining ecological health. Further evidence for this is found in the fact that the new contacts were already involved in conservation, so the result is not entirely accounted for by my personal contacts already being involved in this type of work.

There is concern for the local ecosystem. All eight participants indicated they were interested in increasing their involvement in conservations projects. One participant indicated they have a project in mind that they would like to start, demonstrating innovation within the community. Two other participants indicated they would participate if others were joining as well. Community action is important to these projects, both in terms of drawing more people in and in terms of the success of the efforts overall.

Conservation is a high priority to these participants which could indicate a pattern in the wider community. In addition, interest in conservation increased when knowledge of the flora was accessed.

Use of local flora for food

Most participants in this survey have used local plants for food at least once in the past year. Even the younger participants who grew up without relying on the local ecosystem for survival use the flora for food. Following the story map, four participants indicated they were interested using local plants for food more often. One of those four indicated they wanted someone to show them the plants and how to use them. Other consultants have expressed this as well outside of the survey; one consultant said to me in relation to this topic, ‘I wish my parents would take me to the desert and show me what the plants are and tell me their names.’ This is how this information was passed down for centuries, but as life shifted away from reliance on the ecosystems, the context in which the younger generations learned has disappeared. This desire to know more shows that the ecosystems are still valued by the population, even the younger generation.

Use of local flora for medicine

Six respondents reported they had used plants for medicine in the past year at least once. Following the story map, six participants indicated they were interested in increasing their use of local plants for medicine but want more information about the plants. This again shows the value of the traditions and the ecosystem but also highlights the difficulty in accessing the necessary information.

There are other sources of medical care today; modern healthcare is commonplace, even in some of the smaller villages. However, the care provided is often reactive rather than preventative. Primary care doctors are not commonplace, so health check-ups and general health monitoring are not available. Also, health professionals can be dismissive. For example, while on fieldwork, my friend's nine-month-old daughter was having difficulty breathing, so together we took her to a nearby hospital. The triage nurses there dismissed the mother's concerns and told her it was probably a birth defect. We tried a medical clinic next and the doctor there was unable or unwilling to give advice. Eventually we returned home with no care strategy, next steps, or treatment. The mother used aloe (a plant indigenous to the region) on the baby's face and chest and her breathing improved significantly in the next couple of days. While healthcare is available and can treat many health problems, home treatments are sometimes still more accessible.

Follow-up and next steps

At the end of the survey, participants were asked if they were interested in collaborating to develop more e-resources. Three people said yes. One of those was a Shehret speaker who did not identify any of the plants earlier in the survey. This is another way the impact is evident in the region: having access to a small amount of information can build curiosity and interest in learning and applying more information.

Making the information accessible is valued by the people in the region. A high proportion of respondents were interested in knowing about further work being done: six were interested in participating in future surveys, and seven wanted to be notified when new e-resources were published. Even though this survey did not draw many participants, those that did participate are concerned about the ecosystem and interested in making more information about it accessible to others.

Conclusion

The survey results demonstrate that the ecosystem is valued by the population, even the younger generation (under 25), but information about it is difficult to access. Making information available increased the willingness of respondents to participate in conservation in the future. In addition, the participant observation results show that the rich history and tradition of Dhofar are still valued by the younger generation. Documentation projects in Dhofar renew interest in the history and tradition and provide new ways of accessing that information to younger generations. New ways of learning are necessary because the traditional domains have disappeared.

The next section describes and outlines future direction for making the traditional knowledge more accessible, and expanding the languages and knowledge into new domains to encourage sustainability.

4. Future work

Knowledge accessibility

Further surveys and interviews will be conducted to target revitalisation in a way that is both culturally appropriate and accessible to the population. Greater geographic representation and age-group representation would be helpful. Further, women are underrepresented and appear less willing to participate in surveys, so new strategies for connecting with women will be necessary. As such, a next step is to conduct interviews in person and in one of the MSAL, hopefully drawing more women in as well as older generations with lower literacy rates. As connections grow in the region, particularly with Yemeni Mehri speakers, running the survey a second time could help expand the geographic representation.

I will continue to support the younger generation who are interested in documenting and describing the history and tradition of the region. One way this has already been implemented is through co-authoring presentations and journal articles with young Dhofari researchers. This gives them exposure and confidence to present their knowledge in academic settings. This enriches both their presence and voice in academia, and their communication of their history and identity. Some of these young researchers are now publishing independently. In the future I will continue collaborating with the hope that one day the publications about Dhofar are written in Dhofar by Dhofaris.

The survey has demonstrated that there is interest among younger speakers in the history and tradition. There is also innovative thinking, with new ideas for conservation projects and books being produced. There are also suggestions from this generation on topics of further interest which will be the basis for new e-resources to be constructed in the future.

I will continue to work with and engage those who indicated interest in the work of making the knowledge accessible. This group of interested individuals will continue to be updated on new publications and will be collaborators on new material. These resources will be published open access so that the community can benefit from them.

Sustainability

The languages need to be extended into more domains to be sustained. Some possible new domains are school curriculum and government services. There are examples of mother-tongue curriculum in sub-Saharan Africa, such as Mali ,where the first two years of primary education are taught exclusively in the mother tongue when children are taught the basics of literacy and numeracy. In the third and fourth years of school they transition to being taught exclusively in the trade language by the fifth year.[26] This approach has led to fewer drop-outs and increased pass rate and speed for students in schools that practice this pedagogy.[27] Other countries, such as Canada and Wales, have implemented language and culture curriculum in higher education settings.[28] Both of these curriculum strategies have had impact on the resilience of the local languages and on the well-being of the children who are balancing cultures – their parents' and the mainstream culture around them.[29]

Likewise, multi-lingual government services are offered in many places around the world. The Canadian government operates entirely in French and English throughout the country. However, in the far north, territorial government services are also available in many Indigenous languages. The Northwest Territories has 11 official languages, nine of which are Indigenous.[30]

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[26] Penelope A Bender, 'Pedagogie Convergente (Convergent Pedagogy): Using Participant Perspectives to Understand the Potential of Education Reform in Primary School Classrooms in Mali' (Michigan State University, 2006), p. 456.

[27] Maggie Canvin, 'Language and Education in Mali: A Consideration of Two Approaches' (University of Reading, 2015).

[28] W. Gwyn Lewis, 'Current Challenges in Bilingual Education in Wales', *AILA Review,* 21 (2008), 69-86; Stone.

[29] Stone.

[30] 'Official Languages Map', Office of the Northwest Territories Official Languages Commissioner, (2023) <https://olc-nt.ca/resources/official-languages-map/> [Accessed 28 May 2023].

The local knowledge also needs to be expanded into new domains. The botanical knowledge has potential to impact new domains such as urban planning, biodiversity conservation, and livestock management. All these domains could benefit from knowing the uses and value of the plants that are in the diverse areas of Dhofar. Since much of the local knowledge is held in the local languages, expanding the domains in which the knowledge is applied will also help revitalise the languages. At the same time, since this knowledge allowed human population in this region to live sustainably for centuries, this knowledge also has potential to improve the ecological health of the region, even assuming an increased use of the local flora.

5. Conclusion

In conclusion, interest in the history and traditions of the region is being revitalised by arts and humanities research. People are interested in conservation, learning more about the local flora, and in making the traditional knowledge accessible to younger generations.

The languages have new domains into which they are spreading such as text messaging, children's stories, and YouTube videos. The archived material is also being used to create e-resources including the languages and traditional knowledge. These domains are not central to daily life, however, and a greater expansion into daily domains is needed.

There is interest in the traditional knowledge but little evidence that it is expanding. Intentional work is needed to integrate the knowledge into new domains such as urban planning, livestock management, and biodiversity conservation. Since the local knowledge is intrinsically linked with the local ecosystem, making it more accessible should improve local ecological health as well.

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