

Annual Report 2021

Palestine Institute
for Biodiversity &
Sustainability



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Welcome!

Preface

When the Palestine Institute for Biodiversity and Sustainability and Palestine Museum of Natural History opened to the public in 2017, we set up a five-year (2018-2022) strategy of research, education, conservation and community service. We were pleasantly surprised that we were able to achieve our five-year strategy in just four years, despite the (now almost) two years' of COVID-19 pandemic. What drove the acceleration was:

Need - We were on the ground at the right time and the right place to serve a community that was thirsty for the kind of work that we did; from farmers who needed to develop their farming practices in organic ways, to students thirsty for knowledge, to a state of Palestine in the making of better policies, procedures, research, and conservation modules.

Human Capacity - Team members at this institute did amazing work beyond what was asked of them because they believe in our mission, vision, and goals (which center on service and respect). We are grateful to our 2021 team and volunteers. Among the regulars we cite: Mohammad Najajreh, Elias Handal, Mohammed Abusarhan, Johanne Gideon, Amal Handal, Rami Abu Sa'ad, Hanin Saliba, Reem Massad, Zohar Regev, Jessie Chang, and Mazin Qumsiyeh. They also built on the previous work of many others from 2014 until today. We are also grateful to university staff (finance and maintenance office in particular).



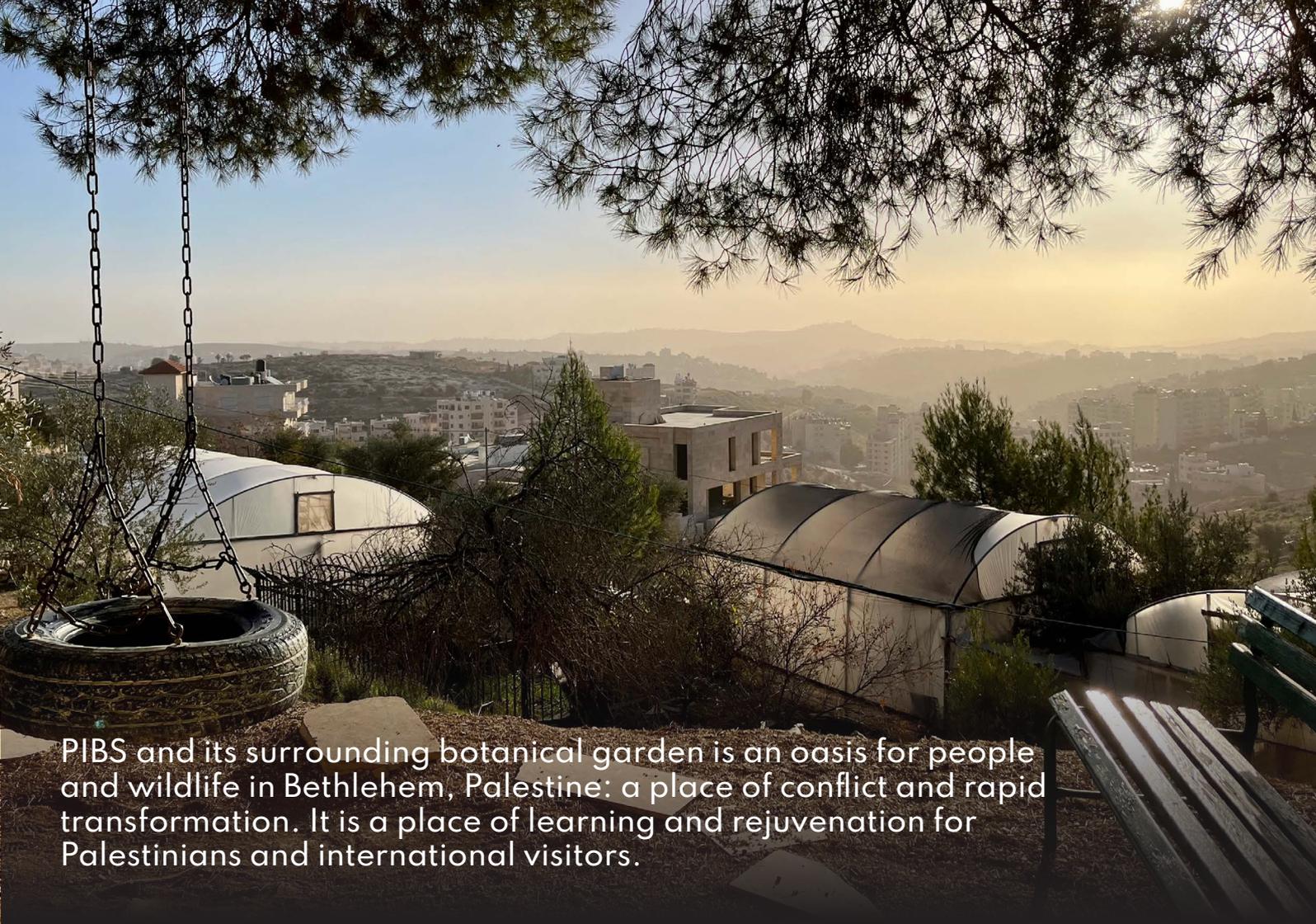
Support of Others - Our supporters were very generous with their monetary and in kind donations, technical advice, moral support, and much more. Without them, the above would certainly not be sufficient to achieve what we (collectively) did. We are also grateful to the trust placed in us by funding agencies and individuals.

Passion - Passion for our work is driven by the need we feel and the knowledge that our actions make a difference. The thousands of visitors that we welcome, students we teach, children who learn by doing, women who participate and discover the value of indigenous herbs, fellow researchers who read our publications and jointly publish with us, and locals in remote communities who feel our presence in

their lives. We can say that the animals and plants (wild or domestic) that we take care of are also appreciative of our work. This is why, unlike most institutions, we never stopped working even in the COVID-19 lockdowns. With specially secured permits, we were able to function and even improve throughout the year and to provide advice and support to local farmers and others on increasing food sovereignty.

When you flip through the pages that follow, you will be pleased to see that we accomplished much more than our supporters, team members, volunteers, and funders' expectations. But we are not just satisfied with this level, we always seek to grow and do more (with your continued support). We plan to renovate an existing building to become truly worthy of being a national museum, introduce new bachelor, masters, and even PhD programs in biodiversity and sustainability, and expand our regional and global influence.





PIBS and its surrounding botanical garden is an oasis for people and wildlife in Bethlehem, Palestine: a place of conflict and rapid transformation. It is a place of learning and rejuvenation for Palestinians and international visitors.

105 volunteers

5,000+ beneficiaries

59 field trips

22 publications

200+ educational events

>\$54,000 unrestricted

donations from **179** donors



History, Mission & Goals

The Palestine Institute for Biodiversity and Sustainability (PIBS) and its Palestine Museum of Natural History (PMNH) at Bethlehem University are national institutions that work to research, educate about, and conserve our natural world, culture and heritage. Our vision is sustainable human and natural communities.

The museum was established in June of 2014 by Prof. and Mrs. Mazin Qumsiyeh, and dozens of supporters, dedicated team members, selfless volunteers, and generous donors. PIBS and its surrounding botanical garden is an oasis for people and wildlife in Bethlehem, Palestine: a place of conflict and rapid transformation. It is a place of learning and rejuvenation for Palestinians and international visitors.

Our Goals are to:

- Explore the diversity of the fauna, flora, and human ethnography of Palestine via collections and scientific research.
- Promote environmental protection, conservation, and responsible interaction between people and the environment.
- Use the knowledge gained and the books, databases, and collections to promote science education.
- Develop and increase respect:
 - a) for ourselves (self-empowerment)
 - b) for our fellow human beings, regardless of background
 - c) for all living creatures and our shared earth.
- Use research results in areas such as biodiversity, history, culture, permaculture and biological control to promote sustainable communities, focusing on marginalized communities.

A briefing on our activities is found in this short video <https://youtu.be/BPhFLOsEIMO> and on the website <http://palestinenature.org>





Achievements

Museum of Natural History

Ethnography Exhibit

Herbarium Unit

Molecular Laboratory

Taxonomy Laboratory

Taxidermy Unit

Botanical Garden

Community Garden

Permaculture Facilities

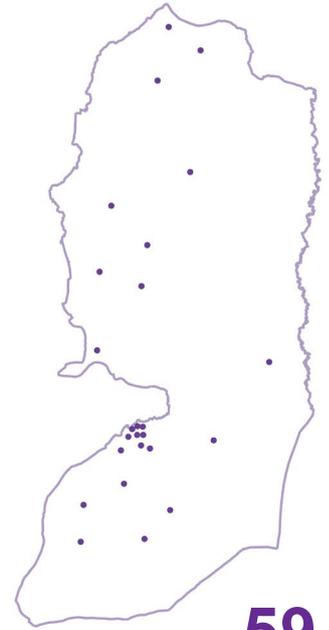
Children's Playground & Exploration Areas

In 2021, as part of a three-year European Union Peacebuilding Initiative (EUPI) funded project, “Unity and Diversity in Nature and Society”, a **Biodiversity Center** was established at PIBS. This included the establishment of a molecular laboratory and the renovation of our taxonomy laboratory space. We held the inauguration for this center on June 21, 2021. To see photos from the inauguration, please view the following [post](#).

Thanks to this fund, alongside The Royal Society fund, the molecular laboratory has been fully constructed and well equipped to do cutting-edge molecular studies (Facebook post [here](#)). Now, both of our molecular and taxonomy laboratories are able to host and train local as well as international personnel (whether they be students or researchers).

Building the Biodiversity Center was based on a scientific and methodical approach, including desktop studies, consultation, professional design of new facilities, and procurement of required materials before opening and starting work. Organizing and prioritizing research studies was then followed by targeted field trips to collect data (example of one [here](#)). In 2021, despite the COVID-19 lockdown, we went on **59 field trips within the West Bank of Palestine**. We especially made great use of the Spring, when most of our flora species blossom and insects are active.





59
Field Trips

The samples gathered from field trips have been used for many purposes. Some samples have been used in molecular research, others preserved, and yet others conserved in our ex-situ conservation program of rare and endangered species.

We are incorporating novel techniques in our **molecular laboratory** to assess the biodiversity of fauna and flora samples in Palestine, such as environmental DNA (eDNA) metabarcoding, as well as classic barcoding to construct phylogenetic trees of different Palestinian fauna and flora families. We expect our research publications to expand with our molecular work.

Invertebrate fauna specimens are mounted and preserved in special boxes, whereas vertebrate samples are either preserved in fluid preservation solutions, or mounted (taxidermied).

Flora specimens are preserved in our **herbarium unit**. This year, we added >600 samples to our previously existing 200 sample collection. Within these added samples we have more than >150 rare and endangered species.

Our ever-expanding collections are used for both research and education. With newly acquired space this year, we were able to curate our collections more efficiently. We have >10,000 invertebrate specimens, >1,000 vertebrate samples, and >800 herbarium species.





The work of our **botanical garden** is to preserve and protect >410 species belonging to 80 families. Currently, more species are being added through our field trips. Within our botanical garden, we have 79 rare species (many are in an ex situ conservation program), 3 parasitic species, and 6 invasive species (being combatted). Our **ex-situ conservation program** currently focuses on two endangered groups: Irises and Orchids. We have four iris species and 15 orchid species in the program.

We have also recently started distributing labels and signs for the plants within our botanical garden. The label data includes family name, Latin name, common Arabic and English name, and blooming period.

Our **community garden** has had new beneficiaries come and enjoy this opportunity, which we offer to the community, but also some of last season's beneficiaries have carried on with us too. It has been exciting seeing the harvested products from these beds, as well as seeing children of the beneficiaries assisting their parents. We have also used the beds that belong to PIBS volunteers as an educational module in some of our weekly environmental educational events.

At the Institute, food sovereignty has been greatly practiced due to the abundance of produce harvested from our **botanical garden**. We have food available from our garden, greenhouse, fruit trees and wild plants which we harvest throughout the year in the seasons as follows:

Winter: Rocket (arugula), broccoli, chard, cauliflower, cabbage, Palestinian carrots (small and purple), peas, parsley, mallow, fennel, green onion, clementine and lemons.

Spring: Fava beans, artichoke, loquat, mulberries, goldenberries, lettuce, and thyme (za'atar).

Summer: Eggplants, tomatoes, black-eyed peas and gourds (these go on through to November), snake cucumber, squash, cucumbers, corn, grapes, and garlic.

Fall: Peppers (both sweet and chili), figs, prickly pears, fennel seeds, basil, passion fruit, and okra.

There are also fish from the aquaponic systems, and eggs from the chickens that we harvest in all seasons.



This year, our animal rehabilitation unit cared for four wild animals brought to us. In December 2020, we received a juvenile Eagle Owl with an injured wing. We tended to the owl's needs, feeding it and caring for it until it was capable of flying again. The owl was [released](#) in late January in the Al-Makhrour Valley to preserve the biodiversity balance in the area.

In July, we [received](#) a seriously injured striped hyena that was attacked by a few villagers due to the lack of awareness in our society about hyenas and the belief that they pose a threat to humans. The hyena suffered many fractures in the spine and thoracic vertebrae. We brought a few veterinarians to assess the hyena's condition and treated her, but sadly the hyena did not make it past one week.

We also received a domestic Kestrel in August. This Kestrel had been kept as a pet by an individual, who after some time decided that they didn't want to keep the bird as a pet any more. Kestrels are wild animals, and they are prohibited to be kept as pets. However, since this Kestrel had been domesticated, it wouldn't have been able to survive in the wild. Therefore, we will keep this Kestrel company; we named her Angela!

Lastly, we [received](#) an injured Red Fox in September. The fox was run over by a car and suffered a head injury as well as a swollen eye. The fox stayed at our unit for a few days, and was assessed by two veterinarians, but its condition required it to be transported to Nablus to be treated by a vet there. The fox had an operation done and was soon [released](#) back to the wild.

We also occasionally care for snakes, which are found in neighboring areas. To minimize the killing of snakes, we rescue the snakes and release them in a far-off corner of the garden.





Environmental Education & Awareness

For us, education is a life-long-venture that contributes to a sustainable natural world and society. At PIBS, we provide an environment for people of all ages where they are able to grow their intrinsic curiosity and love of nature (we have influenced the lives of people ages 2-92!).

In January 2021, we started a new series of educational events tailored to **Palestinian children** of different ages and backgrounds. Thus far, we have held 33 events under this campaign, hosting over 609 children ages 3-14. Our events usually take place outdoors (mainly in our Botanical Garden), but sometimes some activities require being indoors. They include activities such as:

1. **Scavenger hunts** - for example, our “Leaf Identification Scavenger Hunt” required kids to hunt for specific shapes of leaves in our Botanical Garden.
2. **Upcycling and recycling activities** - for example making hydroponics self-watering planters from old water bottles or making bird feeders from toilet paper rolls.
3. **Taking advantage of herbs found in our garden** - picking za'atar, grinding it and making za'atar manakeesh (thyme pies), as well as making lavender/fennel/rosemary scented playdough.
4. **Crafts featuring nature** - such as nature impressions using clay, and bird nests using only organic material found in our botanical garden.

And finally, since PIBS has a biodiversity center focusing on the molecular aspect of science, we included scientific activities such as:

5. **Introductions to entomology, cytogenetics and microscopes**



Starting in June of 2021, we also partnered with the Salesians of Don Bosco in the Middle East Region at Cremisan to promote a similar idea. We have taken an approach of coaching that encourages children to love, respect and care for our environment by emphasizing how cultures, morals and religion foster such responsibility in us. We have held **ten events with 225 Palestinian children**.

Over the summer break, we also held **two separate summer camps** - one focusing on science, and another focusing on Palestinian heritage. The first hosted 23 children ages 7-14 for a total of 6 days, and the latter hosted 17 children ages 12-15 for a total of 6 days.

Our educational events have not been limited to serving children only, but we have also targeted other groups. For example, in June of 2021, we started a series of workshops for Palestinian women. These workshops aim to empower the entrepreneurial spirit of women from various backgrounds (age, economic status, those from urban areas, villagers, and refugees). We focus on protecting the environment through capacity building in areas such as; agriculture around the home, the production of household items including personal care products using natural ingredients, and the recycling and upcycling of solid and liquid waste. Thus far, we have held **16 workshops where a total of 95 women** have attended.





Within the EUPI funded project “Unity and Diversity in Nature and Society”, we have been targeting yet other groups: school and university students, as well as researchers and educators. We have had a total of 526 participants under this project this year. Some of these activities include:

- Tours in our Natural History Exhibit, Ethnography Exhibit, and Botanical Garden
- Exchange visits to other centers such as The Palestinian Centre for Rapprochement between People
- Workshops in our Biodiversity Center (molecular, taxonomy and herbarium laboratories)
- Workshops and training for Biology teachers and researchers

We have also been working on developing our Mobile Educational Unit (which falls within the EUPI project) as well. This unit aims to reach out to marginalized communities in Palestine who do not have the capability of visiting our museum. Our mobile museum will display different samples from our exhibit collection and spread awareness about Palestine’s natural history and extensive biodiversity. During visits to our institute, we use our exhibits as our major educational module. Despite the COVID-19 pandemic, **over 2,000 museum visitors learned about nature and nature conservation with us this year.**



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conservation with us this year.

We continue to update the exhibits by adding new specimens as well as printing new posters and brochures. This year, the PIBS team mounted three new vertebrate samples* to be added to the exhibit: a peacock, a fox and a hyena. In addition to advancing our natural history exhibit, this was a learning experience for our two new team members. View photos of the taxidermy event [here](#).

A most exciting addition to the natural history exhibit this year was the generous [donation](#) made on March 2nd of **a collection of 30 Palestinian birds**. The collection was created by Dr. George Ruddingo more than 70 years ago. We are very grateful to the Ruddingo family for trusting us to preserve such a collection and to use it for research and educational purposes.

A **biogas unit** constructed by volunteers was also added to our collection of modules this year. Biogas is a renewable fuel produced by the breakdown of organic matter such as food scraps and animal waste. The volunteers completed this project in just one day, and we have been using the gas produced on one of our stovetops. Watch a fun video about the volunteers bringing it to life at PIBS [here](#).

*Note that all the samples we taxidermy are deceased animals we receive, we do not harm the animals for taxidermy. Our mission is to conserve our biodiversity, but when these samples are found dead, we preserve them for educational modules.





Conservation

We were involved in numerous projects that promote conservation. One of our biggest accomplishments in 2021 was being entrusted by the State of Palestine to write the **6th National Report to the Convention on Biological Diversity (CBD)** and lead the construction of the **National Biodiversity Strategy and Action Plan (NBSAP)**. This year, after many working hours, we finished writing the 6th NR, and the report can be found [here](#). We are currently working on the National Strategy, which will map plans to 2050 for the whole country but also provide a blueprint for our own work. This project is an ambitious program and will develop significant funding and build human capacity in areas of biodiversity, climate change, adaptation and mitigation.

Through a grant from the Belgian Natural Academy of Sciences (MRV), we did a **project to generate a system of protected area management** that bridges the research-policy gap. Prof. Qumsiyeh also worked with a team of legal and environmental experts to review laws, treaties, and policies related to the environment so that we can have new sets of environmental laws and policies adopted by the State of Palestine. The same institute decided to fund us starting December 1 for six months to **mainstream the NBSAP**.

Prof. Qumsiyeh was also selected as an International Environmental Expert to be part of a team of consultants that worked to **reexamine environmental laws, policies, regulations, and international treaties** (signed or unsigned) by the state of Palestine (project under the leadership of the Environment Quality Authority).





We also believe that grassroot action for conservation is critical. In 2021, we were represented online both at COP16 for the CBD (in China) and at COP26 for the climate change convention (at Glasgow, UK). Working with various groups, especially from the global South, we try to make a difference in global agendas. In some areas we were collectively successful (e.g., in getting the EU and other countries to put more money to developing countries for biodiversity and climate change work) while in others we were not so successful (e.g., on getting serious about greenhouse gas emissions and deforestation in the Amazon and elsewhere). Public awareness activities through Palestine Action for the Planet will hopefully become more personal in addition to online activities as pandemic restrictions are lifted.

We are continually working on improving our knowledge about conserving our environment. We therefore participated in three international conservation training sessions this year. The first was the “3rd Mediterranean Plant Conservation Week ‘Strategies: from Science to Practice’”. These sessions aimed at training researchers and young scientists in the field of Mediterranean plant conservation. The second was “2021 CLP Project Planning and Fundraising Regional Training”, which aimed at increasing the capacity of young conservationists to obtain funds and to increase the quality of their proposals to the Conservation Leadership Programme (CLP) as well as to other small grants programmes. And last but not least, the “International Association of Botanic Gardens: ‘Botanical Garden Development and Management’” training course, which aimed at enhancing the botanical gardens within the conservation field in Asian developing countries.

In November 2021, we held the 1st Conference in Biodiversity & Human Diversity in Palestine. The main theme of the conference was strengthening biodiversity and human diversity in Palestine. The conference is conducted through the EUPI funded project titled “Unity and Diversity in Nature & Society”. The conference brought together experts from the region, as well as local researchers and students who are interested in diversity related topics, focusing on biodiversity, human diversity, and education. A total of 113 participants joined the conference, with 83 attending in person from different regions such as: the West Bank of Palestine, Jerusalem, and 1948 lands; and 30 attending virtually from all over the world.



Grassroot action for conservation
is **critical**



PIBS Team, Volunteers & Donors

2021 has been a year full of changes for the PIBS family. Unfortunately, we said goodbye to four of our team members (Abdelsalam Al-Janazrah, Mohammed Abu Amriya, Linda Majaj and Reena Saeed) due to their projects ending, moving overseas, or accepting new positions. We wish them all the best in their future endeavors! We also welcomed three new team members: Amal Handal, Johann Gedeon, and Rami Abu Sa'ad. Welcome to the PIBS family, and we wish you many years to come!

Our team now consists of 11 members, with three of them being full time volunteers (Prof. Mazin Qumsiyeh, Jessie Qumsiyeh, and Zohar Regev).

But the PIBS family does not just consist of our team, it consists of every person who supports this institute. One can be a supporter by simply following us on Facebook, keeping up with our news, liking and commenting on our posts, as well as sharing the works of this Institute. Other ways of support include volunteering.

At PIBS, we believe in providing the freedom for volunteers to implement whatever they envision without any restrictions. Volunteers are encouraged to bring their own ideas and areas of expertise to advance our institute. Some of our major educational modules were volunteer driven.

Volunteering at PIBS provides the opportunity to learn new skills, make a valuable contribution, meet new people, and learn about Palestinian culture. Some of the tasks

that the volunteers help with are: assisting in the botanical garden, feeding the animals, assisting in animal rescue and rehabilitation, research, fundraising, exhibit collection management, administration issues, cooking, helping with children's activities, design (for example this annual report), and much more! For non-local volunteers, all living costs (meals and accommodation) are covered.

In 2021, we had a total of 105 volunteers at PIBS. With COVID-19 travel restrictions, international volunteers declined compared to previous years, but local volunteers picked up the pace.

One example of accomplishments volunteers can reach in a short period of time is the example of Julius Pahl. Julius volunteered with us for a few months during the 2020 lockdown. He worked with Dr. Mazin on his undergraduate thesis surveying Orchids of the West Bank, and his thesis was recently published ([Pahl, J & M.B. Qumsiyeh, 2021](#)). But Julius helped in other tasks as well. He took lead on orchestrating the translation of the PIBS website, as well as designing the 2020 annual report. Julius will visit us again, as he is pursuing graduate study in plant conservation. This is just an example of what volunteering can look like at PIBS; a collaboration where both sides benefit.

Another exemplary model is our full-time volunteer Zohar Regev. Zohar has been volunteering at the museum since 2019. She occupies her time in our botanical and community garden: planting, weeding, feeding animals, watering and

harvesting the plants. Zohar's commitment and sense of responsibility to a sustainable living has enhanced our zero waste and food sovereignty practices.

Zohar, alongside Jessie, have been organizing and consistently holding our Monthly Virtual Volunteer Meetings. These meetings include both PIBS team members as well as local and remote volunteers. This has become a tradition that connects us with friends over the world, as well as keeps our supporters up to date on our progress. It is also a great place to strengthen relationships and network with new people. Those interested in joining these meetings, can send an email to: info@palestinenature.org.

Since we are a non-profit organization, we rely heavily on donations. This institute began with Dr. Mazin and Jessie's generous donation of a quarter million dollars, and has carried on due to the continuous donations from supporters like you. In 2021, we received >\$54,000 in unrestricted donations, from 179 donors, including eight organizations.

We are sincerely thankful for all of our supporters and donors. We know that if it wasn't for all the support we have gotten, we wouldn't be where we are today. A simple donation goes a long way. For example, Ms. Elena Probst donated €8,400 over the course of 1 year (2021), and that has allowed us to hold 34 free-of-charge children's activities, with a total of 649 Palestinian children participating in the events. Ms. Probst has rounded up her donation to €10,000 for 2022, and hopefully this will

allow us to double the number of events and participants in this coming year!

Of course, the more support we have, the more accelerated growth we have, the more people we influence. Donating (money or in kind) is an important way to help us build the institute and advance our collective work to serve nature and society. "For it is in giving that we receive", be part of the change, and support our cause.

TO VOLUNTEER

<https://www.palestinenature.org/volunteer/>

TO DONATE

<https://www.palestinenature.org/donations/>



Three of our team members: Reem Massad, Johanne Gedeon, and Zohar Regev did not appear in this photo.



Our Future

We plan to renovate a new building to become truly worthy of being a national museum, introducing new bachelor, masters, and even PhD programs in biodiversity and sustainability, and expanding our regional and global influence. The renovation of the north building in 2022 will be such that it creates a reception area, at least three exhibit areas (see figures below), a cafeteria, and a gift shop.



The following are our ongoing projects for 2022:

- Unity and Diversity in Nature and Society (EU funded): Strengthening the three centers (Biodiversity, Education, and Human Diversity)
- Enhancing molecular research work with Royal Society and Natural History Museum, London
- National Biodiversity Strategy and Action Plan: Stakeholder Engagement, workshops, writing, and mainstreaming (Italian and Belgium funded, EQA partnership)
- Medicinal Plants (Swiss funded): Researching, planting, scaling
- North Building Renovation and Museum infrastructure development
- Children Space Development
- Expanded Environmental Education and Awareness Program
- Expanded Animal Rehabilitation Unit
- Building an Ethnoecology Center

Research & Publication

Our mission in this institute is: research, educate about, and conserve our natural world, culture and heritage and promote responsible human interactions with our environment.

To accomplish our first mission, **research**, we had set an ambitious goal of publishing two articles per month this year, and we almost delivered! We published on many topics from plants, to insects, to reptiles, to birds, to illegal trade of endangered animals, to sustainability, to climate change, occupation, and much more. Visit this [link](#) to find our entire list of publications at PIBS.

Find below citations for the 2021 published articles:

Al-Sheikh, B. and M. B. Qumsiyeh. 2021. Imperiled ecosystems in Palestine: Rare plants as Indicators. Pp. 1-7 In Dominic DiPaolo & John Villella Imperiled: The Encyclopedia of Conservation", Reference Module in Earth Systems and Environmental Sciences, Elsevier. [Link](#)

Al-Sheikh, B. and M. B. Qumsiyeh. 2021. New Records for the Native Flora of the West Bank, the Occupied Palestinian Territories. *Jordan Journal of Natural History*, 9:11-19. [Link](#)

Handal, E. N., 2021. A Teratological Record of the Southern Green Stink Bug *Nezara viridula* (Hemiptera, Heteroptera, Pentatomidae) from the Occupied Palestinian Territories (West Bank). *Jordan Journal of Natural History*, 8:45-46.

Handal, E. N., 2021. Tail Malformation in *Ablepharus rueppellii* (Reptilia: Scincidae) from the Occupied West Bank, Palestine. *Jordan Journal of Natural History*, 8, pp.51-53.

Handal, E. N. and M. B. Qumsiyeh. 2021. Status and Distribution of the invasive Myna *Acridotheres tristis* (Linnaeus, 1766) in the Occupied Palestinian Territories (West Bank). *Sandgrouse*, 43:129-132 [Link](#)

Handal, E. N., Z. Amr, W. S. Basha, M. B. Qumsiyeh. 2021. Illegal Trade in Wildlife Vertebrate Species in the West Bank, Palestine. *Journal of Asia-Pacific Biodiversity*, 14(4):636-639.

Mourad-Hanna E., K. G. Friberg, and M. B. Qumsiyeh. 2021. Temporal change in traditional knowledge and use of wild plants in Artas, Palestine. *Palestine Exploration Quarterly* [Link](#)

Pahl, J. and M. B. Qumsiyeh. 2021. Orchids of the Occupied Palestinian Territories (West Bank, Palestine). *Mediterranean Botany*, 42:e72120. [Link](#)

Qumsiyeh, M. B. 2021. Challenging colonization: Building sustainable human and natural communities in Palestine. *Radical Ecological Democracy* [Link](#)

Qumsiyeh, M. B. 2020. Giving hope and getting results for sustainability in Palestine. *Kapitál* (Slovak cultural monthly journal). [Link](#)

Qumsiyeh, M. B. and M. Abusarhan. 2021. The Palestinian Environment under Israeli occupation. [Link](#)

Qumsiyeh, M. B. (in press) Of Thawed Memories: A novella. In *Detours: A Decolonial Guide to Palestine*, edited by Lila Adib Sharif, Jennifer Lynn Kelly, and Somdeep Sen. Duke University Press.

Qumsiyeh, M. B. A Palestinian Reflection on What We Learn. In "Our Vision for Liberation: Engaged Palestinian Leaders & Intellectuals Speak Out" edited by Ramzy Baroud and Ilan Pappé. [Link](#)

Qumsiyeh, M. B. 2021. An oasis of Hope Under Repression: The Palestine Institute For Biodiversity And Sustainability. *Bandung Spirit Bulletin*, 2:12-16. [Link](#)

Qumsiyeh, M. B. and M. Abusarhan. (in press) COVID-19 Impact on Biodiversity in Palestine. *Africana Studia*.

Qumsiyeh, M. B. and M. Abusarhan. 2021. Biodiversity and Environmental Conservation in Palestine. Pp. 1-22 In Münir Öztürk, Volkan Altay, & Recep Efe, editors "Biodiversity Conservation and Sustainability in Asia. Vol. 1. Prospects and Challenges in West Asia and Caucasus." Springer Nature, Switzerland.

Qumsiyeh, M. B. and I. M. Albaradeiya. 2021. The Palestinian Environment: Threats and Opportunities. *This Week in Palestine*, 276:12-18.

Qumsiyeh, M. B. and I. M. Albardeya. (in press) Palestinian environment: Threats and opportunities. *Africana Studia*.

Qumsiyeh, M. B. et. al. (in press) Culturally sensitive Climate Change Education Under Israeli Colonial Occupation in Palestine. *Africana Studia*.

Handal, E. N. and Christopoulos, A. Record of Hind Limb Malformation of *Heremites vittata* from Palestine (West Bank). *Herpetology Notes*. Submitted.

Handal, E. N., M. Abusarhan, M. B. Qumsiyeh, R. Bani Hani, D. A. Warrell, and Z. S. Amr. Epidemiology of scorpion sting in four districts in the Palestinian Territories. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. Submitted.

Qumsiyeh, M. B. and E. N. Handal. 2021. Revisiting adaptive nature of chromosome evolution in placental mammals. *Hystrix, the Italian Journal of Mammalogy*. Submitted.

We are also currently working on databases. We constructed our own preliminary list of 600 plant species of concern in the West Bank, based on Global Biodiversity Information Facility (GBIF) analysis. We produced that [list](#) as a part of the published paper "Imperiled Ecosystems in Palestine: Rare Plants as Indicators". Among those species are 187 endangered, 171 very rare, and 238 rare, and four are extinct.

We also promoted research through cooperation with Palestinian researchers. The EUPI funded project allowed us to give 19 grants each up to 4,000 euros for research in areas of human and biological diversity to local researchers on both sides of the Green Line. Each research will generate a publication and an educational module.

Kindly find below the titles of the ongoing research projects:

1. Enhanced Fodder Production Using Treated Wastewater from a Pilot Constructed Wetland System.
2. Medicinal Plant of North West Bank in Palestine: Diversity and Traditional Uses.
3. Use of wild and Medicinal Plant biodiversity in Palestine as a source of bio-pesticides.
4. Assessing the occurrence, distribution, and status of the Pallid scops owl, a new discovered breeding species in Palestine.
5. Final exon frameshift biallelic PTPN23 variants are associated with microcephalic complex hereditary spastic paraplegia.
6. Teaching and Learning Bee Extinction Through Project-Based Learning (PBL) and its Impact on the Classroom Climate Among Eighth Graders Students.
7. Removal of nitrates from water through the use of Chia seed.
8. Strategic Planning to Promote the Culture of Urban Agriculture among Palestinian University Students as a tool to Support Bio-human Diversity in the Palestinian Cities.
9. Survey of the Mosquito Fauna (Diptera: Culicidae) from the Jordan Valley - North Eastern the Occupied Palestinian Territories (2020-2021).
10. Solidifying human diversity and unity in the Palestine solidarity movement.
11. Ecological Corridors within the Al- Makhroul Valley System (Battir, Husan and Wadi Fukin).
12. Assessing the occurrence, distribution and the status of the Arabian wolf in Palestine: A critically endangered wolf species at the global level.
13. Studying the parasite fauna in resident and migratory birds, and the chromosomes of resident birds.
14. DNA Barcoding Orchids of Palestine.
15. Identification of Palestinian local eggplant accessions (*Solanum melongena* L.) using DNA barcoding.
16. Palestinian Food as a Form of Resistance.
17. The traditional use of the plants in Sabastiya in the past and present.
18. Molecular assessment, antimicrobial activity and antioxidant activity of carthamus species growing in Palestine.
19. Genetic identification and Conservation of the endangered White cucumbers in Palestine.

Fundraising - Grants

The following are ongoing grants/projects for which we received **funding**:

Jan 2022 to Dec 2023, "Innovative multiplexed, label-free DNA-based detection platform". Main German partner Prof. Wolfgang Fritzsche and main local partner Prof. Mazin Qumsiyeh. **€8,000** to our PIBS center funded by the German Federal Ministry of Education and Research.

Dec 2021 to May 2022, "Education and awareness for mainstreaming and public engagement in formulation of the new National Biodiversity Strategy and Action Plan (NBSAP)". **€7,964.29** funded by the Royal Belgian Institute of Natural Sciences (RBINS).

Oct 2021 to Dec 2024, Renovation of the North Building. **\$1,100,000** partially funded by USAID (ASHA).

Jan 2021 to Dec 2022, Educational Children Activities. **€18,400** funded by Ms. Elena Probst.

2021 (delayed to implement to 2022), "Crowdfunding campaign for a children room at the Museum". Exceeded our expectation of funds (**\$7,700**)

Jun 2020 to Jun 2021, "Green Oasis in Bethlehem for Plant and Ecosystem Conservation". **\$20,000** funded by Mediterranean Basin Hotspot-CEPF-MED.

Jul 2021 to Dec 2022, "Consultancy to build 6th National CBD report and National Biodiversity Action Plan (NBSAP) for Palestine". **€195,745** funded by the Ministry of Finance and Environment Quality Authority.

Jun 2020 to Jul 2021, "Academic Cooperation with the Environment Quality Authority to Refine Strategies for Biodiversity Conservation in Protected Areas in Palestine". **€6,127** funded by Royal Belgian Institute of Natural Sciences (RBINS).

Jan 2020 to Dec 2022, "Unity and Diversity in Nature and Society". Partnership of PIBS, Galilee Society and Palestinian Center for Rapprochement Between People. **€849,610** funded by the EU Peacebuilding Initiative. EuropeAid/162124/DD/ACT/Multi, Grant Reference ENI/2019/162124/83

Dec 2019 to Nov 2022, "British and Palestinian Museum Collaboration in Research, Education, and Conservation". Partnership from Prof. Alfried Vogler of the Natural History Museum, London and Prof. Mazin Qumsiyeh of PMNH. **£208,600** funded by the Royal Society.

We also submitted **four other grants** in late 2021, and expect to hear good news on them.

Media & Visibility

On January 1, 2021, PIBS launched a new website (www.palestinature.org/). The website has been translated into four languages: Arabic, Russian, French and German. Two more languages are underway: Italian and Spanish. This accomplishment has been heavily reliant on volunteers' efforts. We have had a total of 22 individuals work on the release of the website, with 19 of them being volunteers. Below we would like to acknowledge those involved in the translation process as well as the design of the website:

Arabic (Mohammad, Mohammad, Belal and Reena)
Russian (Katja)
French (Brooke, Martin, Inga, Lysiane, Chris and Dine)
German (Julius, Inga and Clemens)
Italian (Stefano and Susanna)
Spanish (Carmen, Alejandro, and Marta)
Design (Betty, Rob, Belal, Yolanda, and Dany)

Through several projects, we have designed and printed several brochures, which serve as an educational module and informative sheet. Some of these brochures are:

Botanical Garden at PIBS
Biodiversity Center
Orchids of Palestine
Al-Makhroul Valley
Farmer's guideline

In cooperation with Enabel, the Belgian Development Agency, and Terre des Hommes Italy, we have produced six animation movies based on existing brochures that educate children on important, relevant topics. These topics and the links are as below:

1. Climate Change: [Video](#), [PDF](#)
2. Energy and transportation: [Video](#), [PDF](#)
3. Agriculture: [Video](#), [PDF](#)
4. Biodiversity: [Video](#), [PDF](#)
5. Waste & Chemicals: [Video](#), [PDF](#)
6. Geography: [Video](#), [PDF](#)

Under the Darwin Initiative - United Kingdom project, we also produced four TV sessions, which have been broadcast on local TVs. These sessions are very informative, and they do a good job of introducing people to the concept of Biodiversity (which until this day is an unfamiliar word to some, or most, people), as well as emphasizing the concept of ethical and local shopping.

1. Biodiversity and Sustainability: [link](#)
2. Biodiversity Conservation: [link](#)
3. Community Farmers and Nature: [link](#)
4. Community Enhancement: [link](#)

Palestine Institute for Biodiversity and Sustainability

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