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Factors of success and failure for transboundary environmental cooperation: projects in the Gulf of Aqaba

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ABSTRACT

After signing a peace accord in 1994, joint projects were initiated between Israel and Jordan aimed at enhancing environmental protection and resource management. This paper discusses the Red Sea Dead Sea Canal, the Eilat-Aqaba Municipal Cooperation initiative, the Joint Oil Spill Contingency Plan and the Red Sea Marine Peace Park (RSMPP). The latter is an exemplar of transboundary cooperation for planning of a marine protected area and therefore the main case study. Although the RSMPP never fully materialized, analysis of what transpired provides important lessons. We examine what happened in the 20 years since the attempt to establish the RSMPP began and focus on which of its goals were achieved. As a basis for analysis this paper presents factors identified as significant to the success of transboundary protected areas (TBPAs) and uses them to compare the RSMPP to the three other initiatives. In addition to factors reported in the literature that are known to be effective for TBPA success, we found two new factors as most relevant for the RSMPP case: a peripheral geographic location and intensive work among professionals, mostly marine scientists, on the ground operating under a low profile and with limited public attention.

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1. Introduction

The signing of the Jordan–Israel peace accord in 1994 ushered in a new era of collaboration and hope for environmental quality improvement in the region. Geography and shared resources, especially those related to water, forced collaborations between entities along the two countries' borders for some time prior to the peace accord such as in the area of the Dead Sea and for management of water on the West Bank (Arieli, 2012; Garfinkle, 1992; Lukacs, 1999). However, in the period leading up to signing of the peace accord, additional new projects were sought which could significantly strengthen ties between Israel and Jordan and lead to normalization, in other words, to improved social, institutional and economic cooperation between both the regimes and the citizenry. Significant focus was put on the coordinated protection and management of the marine area at the northern tip of the Red Sea. This resulted in the Red Sea Marine Peace Park (RSMPP) being put forth as an environmental protection initiative, as well as an economic development opportunity, for the two countries to work on together.

The RSMPP was a harbinger of the 'peace parks' paradigm gaining momentum in other parts of the world at the turn of the millennium. Such parks received significant attention over the subsequent decade, particularly from environmentalists and scholars of conflict resolution (Ali, 2007). Peace parks are a type of transboundary protected area (TBPA), sometimes referred to as transfrontier conservation areas (Barquet, 2015; Metcalfe & Kepe, 2008). A 2001 monograph on the subject of TBPAs published by the International Union of Conservation of Nature (IUCN), defines peace parks (or 'parks for peace') as simultaneously dedicated to the protection and maintenance of biological diversity, natural and cultural resources and to the promotion of peace and cooperation (see Hammill & Besançon, 2007; Sandwith, Shine, Hamilton, & Sheppard, 2001).

At the time the 1994 peace accord was signed, Jordan and Israel committed to: (a) protect natural coastal and marine habitats, particularly coral reefs; (b) improve sea water quality; (c) prevent water pollution from marine and land sources; and (d) develop oil spill emergency response efforts and preparedness. In retrospect, the RSMPP program has been the most ambitious attempt to bring about Israeli–Jordanian environmental cooperation in the Gulf of Aqaba (Sadeh, 2015). However, the idea of the park itself fell apart with time, decreasing from formal medium-level cooperation to low-level cooperation,¹ albeit with some continued governmental and third party involvement. Collaboration to protect the marine environment of the Gulf of Aqaba has continued to decline over the years; it has become less consistent, less intense, and it occurs with less formal governmental involvement and funding, yet some important areas of activity remain (Arieli, 2015; Sadeh, 2015).

This article presents the factors leading to the success and failure of TBPA in general, as based on the literature, especially meta-analyses, and points out how these are relevant for the RSMPP. Our review is followed by a comparison of the RSMPP to three other collaborative projects between Jordan and Israel in the area, thus highlighting factors that enable the drawing of lessons specific to the RSMPP.

1.1. Transboundary environmental protection

Transboundary environmental protection initiatives take on many forms. As ecosystems do not follow clear, socially constructed, anthropogenic and anthropocentric borders, such initiatives are quite important. Waterways and water systems, both freshwater and marine, have a distinctly ‘non-border’ character (Elliott, 1996). In the marine environment, ecosystems usually have porous boundaries making marine TBPA (also called transboundary *marine* protected areas) particularly valuable to marine conservation efforts (e.g. Agardy, 2000; Grilo, 2010; Guerreiro et al., 2010; Kirkman & Mackelworth, 2016). Because they involve countries working together to achieve conservation and environmental protection goals, TBPA can also serve as tools for peace-building. Not every TBPA is considered a peace park, but the notion that some TBPA bring formerly, or currently, conflicted entities to strengthen their ties and improve relations makes their potential for conflict resolution and peace-building substantial, in addition to their environmental benefit (Ali, 2007; Van Amerom & Büscher, 2005).

Ambiguous jurisdictions often hinder the achievement of conservation and environmental protection (Barquet, 2015; Hammill & Besançon, 2007). The need for two or more sovereign entities to be involved in cross-border management because marine area jurisdictional authority involves two or more coastal states, renders such endeavors more likely to fail than if they were implemented by single regional, national or local authorities with clear terrestrial boundaries (Mackelworth, 2012; Metcalfe & Kepe, 2008). Yet, we see that cross-border environmental protection initiatives have been implemented in marine areas around the world and have succeeded in some cases (Grilo, 2010; Van Amerom & Büscher, 2005).

Literature on environmental protection achieved due to the establishment of TBPA is sparse and literature on contributions of *marine* TBPA to environmental protection and conservation is further limited. Thus, the RSMPP is an especially interesting case study, despite chances for its full implementation being stacked against it from the get-go. In a volatile and changing region, this relatively small, yet important initiative has had implications for marine conservation as a TBPA despite it failing to achieve its full potential.

1.2. Factors influencing TBPA

Barquet, Lujala, and Rød (2014) reviewed TBPA established during the years 1949–2001 and presented these in a comprehensive quantitative meta-analysis that covered initiatives in 328 countries, including some with a history of militarized disputes dating from the nineteenth century. In another recent study Mackelworth (2012) reviewed nine marine TBPA with a focus on identifying hazards and best practices related to their establishment and management. Other smaller, but no less significant studies are those reviewing the work presented at conferences on TBPA or reported by various organizations. Phillips (1998) summarizes the main points from the International Conference on TBPA as a Vehicle for International Co-operation. The World Bank (2007) provides a study of the key factors affecting implementation and outcomes of protected areas as part of a report

on the transboundary project it sponsored to protect the Mesoamerican Barrier Reef System. The IUCN offers *Good Practice Guidelines for Peace Parks* mentioned above (Sandwith et al., 2001), which helped raised the profile of TBPAs particularly in view of their potential for promoting peace.

Even when clearly considered ‘peace parks’, TBPAs can exacerbate conflict (Hammill & Besançon, 2007). One reason is that despite their inherent benefits, they do not necessarily promote or even coincide with general national or regional goals of improved relations between involved entities (Brock, 1991; Van Amerom & Büscher, 2005), despite claims that improved environmental conditions engender better relations (Elliott, 1996). As an example the Great Limpopo transfrontier Park in Southern Africa has been criticized as undermining the regional goal of the African renaissance because it highlights the ‘lack of harmonization of land use and legal systems across boundaries’ (see Van Amerom & Büscher, 2005). It should be noted, however, that this case was characterized by problematic elements (some of which are mentioned in Table 1) other than the lack of congruence with regional goals. These include a lack of balance among entities involved in the establishment of the park (South Africa was the overbearing dominant actor), low and superficial community participation and limited economic benefits (Van Amerom & Büscher, 2005).

Ali (2007) justifiably asks whether peace parks are the result of improved relations or rather the cause of cooperation and reduced conflict, as would coincide with the ‘environment-and-security’ paradigm (see Elliott, 1996). As suggested by various scholars, to improve understanding of peace park causes and contributions, it is helpful to examine numerous cases and consider the level of cooperation over time, especially in particular contexts vis-à-vis regional and international geopolitical events that go beyond environmental protection and conservation. Even when a peace park does not reach its original goals, it is worth identifying factors that

Table 1. Factors influencing the success and failure of TBPAs (based on Barquet et al., 2014; Mackelworth, 2012; Philips, 1998; World Bank, 2007; World Conservation Union, 2001). Some are relevant in the case of the RSMPP (see also Portman & Teff-Seker, 2016).

Factor	Rationale
Profitability	TBPAs that are financially profitable (especially from tourism) are more likely to survive and succeed.
Funding	Funding, by governments or third parties, should be stable and last long enough for the project to be successful and sustainable.
Security	For TBPAs to be successful in areas of recent conflict, parties must feel that security considerations are addressed.
Third party involvement	Third party facilitators (e.g. third states or NGOs) can help maintain financial viability and project momentum.
Long-term planning	TBPAs require long-term planning, including platforms or mechanisms for cooperation, to achieve significant results.
Legislation	Cross-border cooperation efforts must be supported and/or guarded by corresponding laws and regulations of participating parties.
Number of participants	Jurisdictional and legislative differences become more problematic the more actors there are in a TBPA.
Environmental status	If the environmental status is poor, this gives a stronger incentive for cooperation (although political considerations can prevail).
Transparency/public awareness	Raising public awareness to ecological matters and to the efforts promoted by the TBPA encourages public support for the project.
Motivation and commitment	Government motivation and commitment are necessary for the project to be financially and practically viable.
Stakeholder interest	The support of government and non-governmental stakeholders relies on whether they view the project as beneficial to their interests – financial, political, environmental or other.
Balance	When division of funds, labor, power or responsibility between participating states is seen as imbalanced, it could decrease willingness to advance TBPAs.
Engagement	Stakeholder and community participation during or before initial planning is beneficial to the longevity and success of TBPAs.
Promoting party	Government, NGO or third party – a strong promoting entity helps advance TBPAs and keeps them relevant over time.
National efforts	In order to survive and thrive, TBPAs should become a part of another national effort (political, financial, social or other).
Monitoring and evaluation	Monitoring the progress of TBPAs helps keep them sustainable over time as emerging problems are identified and solved.
Common values	Common values are a platform on which to build cooperation. Values can include environmental but also social, financial, religious or pan-national values and shared visions.
Learning from other initiatives	As in other cases, learning about current and previous similar attempts has been found to be beneficial for planning successful TBPAs.

contributed to particular partial achievements or conversely, impeded achievement or implementation of specific program elements.

1.3. Joint environmental initiatives

The 1994 Jordan–Israel treaty included several joint initiatives designed to advance common environmental and resource management interests in border areas between the two countries. We identified four such initiatives set up through the 1994 peace accord for comparison: (1) municipal cooperation between the Red Sea coastal cities of Aqaba, Jordan and Eilat, Israel (hereafter Aqaba-Eilat Municipal Cooperation [AEMC]); (2) the Joint Oil Spill Response Plan for the northern Gulf of Aqaba (hereafter JOSCP); (3) the Red Sea Dead Sea Canal (hereafter RSDSC); (4) and the RSMPP. First, we provide an overview of the first three initiatives. After that, we describe the most relevant factors influencing the RSMPP from among those mentioned in reviews of TBPAs, and explain how such factors relate to the other environmental initiatives.

1.3.1. Aqaba-Eilat municipal-level cooperation

Eilat and Aqaba are their respective states’ gateways to the Red Sea and are also considered major tourist locations. Both cities are highly industrialized and the threat of marine pollution is ever present both from land-bases sources, such as municipal sewage, and from marine sources such as oils spills and shipping accidents. The enclosed nature of the Gulf basin and the distance of the two cities from the sea’s outlet engender great environmental vulnerability (see Figure 1); it is clear that careful environmental planning in this area is vital (Loya, 2012).

The AEMC began after the peace treaty was signed in 1994 (Arieli, 2012; Gradus, 2001). Following the opening of a border crossing point between the two cities, many (mostly Israeli) visitors flocked to the neighboring

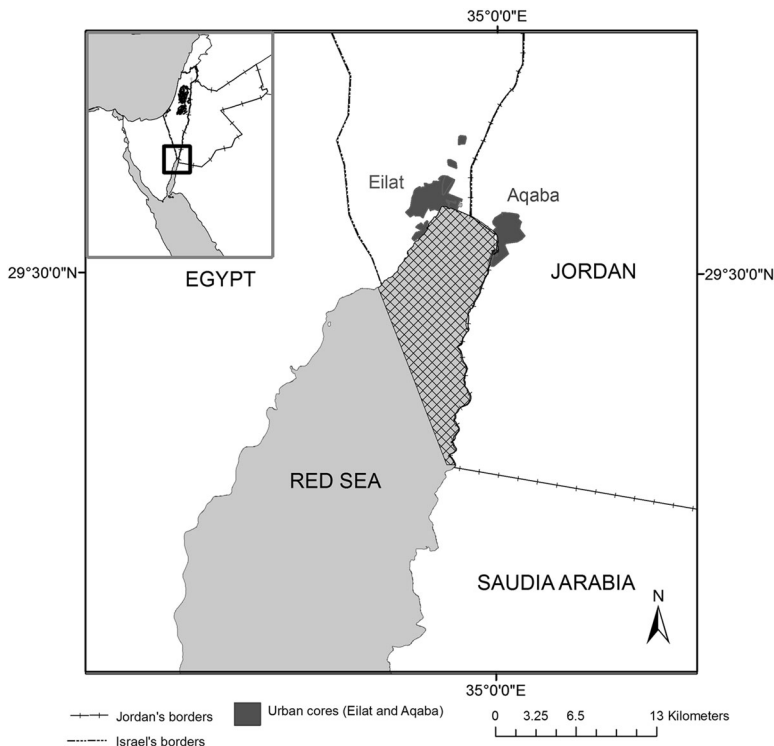


Figure 1. Locus map of the proposed RSMPP area (marked by hatching) in the northernmost part of the Red Sea between Israel and Jordan.

country. Jordanian laborers began working in Eilat. Many projects were proposed as part of the municipal cooperation: a joint airport, shared use of seaports, tour packages to both cities, connecting roads and joint plans for regional preservation (Gradus, 2001). Ultimately, few of these cooperative municipal-level projects came to fruition.

Some cooperation that occurred during the years 2005–2010 involved the residents themselves living along the shared border. Eight joint committees were formed during these years focusing on trade and economy, tourism, infrastructure, health, education, culture, sports, transportation and the environment. However, only a small number of the committees' recommendations were realized. These include development of warning systems for floods, earthquakes and marine pollution, as well as enhancement and joint training of emergency forces; regular cooperation regarding pest (e.g. mosquito) control, joint multilevel programs of study and research, formalized means and protocols for regular communication and cooperation between the Aqaba and Eilat ports, initial stages of cooperation regarding cross-border tourism, and monitoring of freshwater pollution (Arieli, 2015).

Since 2010, such municipal local-level cooperation severely diminished with only very limited cooperation taking place. When cooperation has occurred, informal (and less noticeable) channels of communication are used between local government representatives. The lessening of municipal-level cooperation, both in regards to joint projects and committee work, was mainly due to regional tensions and the growing citizen-level opposition within Jordan to the normalization (i.e. opposition to improved cooperation, trade and diplomatic ties) with Israel (Arieli, 2012; Zeitoun & Mirumachi, 2008).

1.3.2. Joint oil spill contingency plan (JOSCP) for the Gulf of Aqaba

Collaboration for responding to oil spills in the northern Gulf of Aqaba began immediately after the signing of the peace accord. Two ships, one Israeli and one Jordanian, were assigned to patrol the northern Gulf as part of a bi-lateral force charged with handling emergency pollution events. In 1995, Israeli and Jordanian crews cooperated in response to a spill of 30 metric tons of oil in the Gulf of Aqaba. Their actions prevented an ecological disaster and extensive harm to the coral reefs (IMoEP, 2015).

Israel's National Contingency Plan for Preparedness and Response to Oil Pollution from the Sea was approved by the Israeli government in 2008. It included a commitment to international conventions and established a framework for regional cooperation aimed at oil spill prevention, treatment and compensation. This plan declared Israel's intent to uphold its agreements with its neighbors, including the 1995 trilateral agreement between Israel, Egypt and Cyprus and the 1999 Annex IV ('Environmental Quality') to the Israel–Jordan Peace Treaty of 1994 called the Upper Gulf of Aqaba oil spill contingency plan (i.e. the JOSCP). It includes a (non-binding) tri-partite plan for the Gulf of Aqaba between Israel, Jordan and Egypt and specifies the implementation of joint exercises between the parties (IMoEP, 2014c).

The 2014 report of the Israeli National Contingency Plan for Preparedness and Response to Oil Pollution Incidents, describes the JOSCP's four components: (1) preparation of the project and the principals of cooperation; (2) preparation of a regional emergency plan; (3) management and implementation of the regional emergency plan; and (4) construction of new oil spill response centers for Egypt and Jordan and upgrade of the existing center in Israel.² Response team centers conduct training and joint exercises. This report, prepared by the IMoEP, concludes that all the joint efforts have been extremely useful for improving regional response abilities to contain potential oil spills in the Gulf of Aqaba and for treating their related repercussions (IMoEP, 2014c).

1.3.3. The RSDSC

After more than two decades, the RSDSC is still in its planning phase. The project is slated to desalinate water from the Gulf of Aqaba and pump brine (the spoils of the desalination process) to the Dead Sea. The RSDSC's original goals were to provide desalinated drinking water to inhabitants of the Jordan Valley (Jordanians, Palestinians and Israelis), to stabilize the decreasing Dead Sea water level, generate hydroelectricity and to promote regional peace and stability. In February 2015, a contract for construction of the RSDSC was signed only

between Israel and Jordan, without an official Palestinian partner (Al-Khalidi, 2015; Al-Omari, Salman, & Karablieh, 2014; Beyth, 2007; Donnelly, 2014).

Red Sea water will be extracted by a pumping station located in Eilat, treated and then conveyed to a location in the nearby Arava Valley from where it can be transported gravitationally via multiple pipelines to the Dead Sea. The height differences between Eilat (sea level) and the Dead Sea (427 meters below sea level) will allow the generation of hydroelectric power needed for the desalination process itself and for conveyance of the water from the Gulf to points where gravitational forces are sufficient. The plan has been criticized for its potentially detrimental environmental consequences.

In 2005, the three involved parties (Israel, Jordan and the Palestinian Authority) turned to the World Bank, which eventually led and financed feasibility evaluations that were performed in 2008–2013 (Israel Water Authority, 2015). Preliminary reports found that environmental effects would be minimal if a number of specified steps are taken such as minimizing environmental impacts during construction, installing safety valves in the pipes, and establishing limits to quantities of the brine transferred to the Dead Sea, as well as the monitoring and management of other environmental impacts. Following these findings, the implementation of a pilot has been recommended (constituting approximately 10% of the proposed project), thus enabling the team to proceed with development while examining the resulting environmental effects and changes in regional water needs (Markel, Jitchak, & Beyth, 2015). Following the agreement signed between the parties in 2015, the pilot was supposed to be implemented over a period of three years. However, as of the writing of these lines, no progress has been made, in part due to the resignation of the Israeli minister originally involved as well as lack of funding sources and an alleged lack of interest on the Jordanian side (Barkat & Cohen, 2016).

2. The RSMPP case

The planning of the RSMPP began in 1996 and stipulated joint research, monitoring and management of the northernmost part of the Gulf of Aqaba. The park was supported and financed, at least in its initial stages, largely by the U.S. government with the U.S. State Department and the U.S. National Oceanographic and Atmospheric Agency (NOAA) heavily involved (Zimmer, 2001). Before addressing particular factors that impeded or supported its success, we describe its main components.

2.1. Description and history

The RSMPP program included three major elements: (1) joint management efforts; (2) outreach to the adjacent communities about the park; and (3) scientific cooperation for joint monitoring of marine ecosystem health. Economic development was an important goal of the RSMPP, since tourism and recreational uses in the northern Gulf of Aqaba are important to both countries (NOAA, 2007; Portman, 2007). Although other initiatives for peace parks between Israel and its neighbors have been proposed over the years,³ the RSMPP is the only one to have attained some measure of success (Sadeh, 2015).

As a way to advance two of the three components of the RSMPP – joint management and monitoring – the U.S. Agency of International Development's Middle East Regional Cooperation program approved a proposal in 1997 put forward by NOAA and stakeholders in Israel and Jordan. Officially called the Cooperative Research, Monitoring and Management Program to Address Pressing Environment and Development Issues in the Binational RSMPP – Gulf of Aqaba/Bay of Eilat,⁴ the three-year program was launched in September 1999 (IMoEP, 2014a; NOAA, 2007). Its stakeholders included, on the Israeli side, the Israel National Parks Authority, the Israel Ministry of Environmental Protection (IMoEP) and the Interuniversity Institute (IUI) for Marine Sciences in Eilat. Jordanian participation was led by the Aqaba Special Economic Zone Authority (ASEZA)⁵ and the Jordanian Marine Science Station. The U.S. Agency for International Development (USAID) acted as the main third party and provided most of the funding for the RSMPP with Israel and Jordan providing in-kind contributions (Gabay, 1997; Portman, 2007).

The scientific monitoring program was well on its way when other components, particularly the joint management and outreach, were found to require a greater number of participants and the need for greater funding

than was originally anticipated. Coordination, significant capacity building and financial assistance from external parties, namely USAID and NOAA, were needed for outreach and management.

USAID funding of the project officially ended in 2003, but at the international symposium that marked its conclusion, the IMoEP and ASEZA signed a Memorandum of Understanding (MoU) to continue a monitoring and data collection program. The MoU called for coral reef mapping, monitoring and data management (IMoEP, 2005). The agreement confirmed the intent of both states to continue to cooperate in maintaining the core elements of a recently initiated ecosystem monitoring and data management program in the northern Gulf of Aqaba while outreach was neglected (IMoEP, 2014a; NOAA, 2007). The MoU did not include joint management or outreach plans, and soon after its signing, each country's stakeholders went back to managing their own part of the marine area (Genin, Scientific Director, The Interuniversity Institute for Marine Sciences in Eilat, personal communication, September 30, 2014; IMoEP, 2014a; NOAA, 2007). Nevertheless, since 2005 the continued cooperative research program shows certain hoped-for improvement of the marine area environment between the two countries. For example, live coral cover at the Eilat reefs has gradually increased (IMoEP Bay of Eilat National Monitoring Reports, 2005–2014). The ability to compare data collected on both sides of the Gulf has enabled researchers to better understand the effects of different variables, such as local pollution, and to separate those effects from natural processes affecting the coral reefs on both sides of the Gulf (Genin, personal communication, September 30, 2014; Shaked, head of the National Monitoring Program in the Bay of Eilat, The Interuniversity Institute for Marine Sciences in Eilat, personal communication, October 6, 2014).

Although the improved environmental status of the RSMPP area is a successful outcome of the program, from among the originally proposed elements only the monitoring program has continued and it has done so on a modest basis with some joint dives, field work and meetings to discuss research (Genin, personal communication, September 30, 2014; IMoEP, 2005). Bi-annual joint expeditions and data sharing continue, but each country's scientists report research results separately (Genin, personal communication, September 30, 2014; IMoEP Bay of Eilat National Monitoring Reports, 2003–2014; Shaked, personal communication, October 6, 2014). As such, the outward appearance of separation is maintained and the image of official collaboration is avoided.

A major setback occurred when joint monitoring trips were suspended due to Israeli–Palestinian tensions in 2009; however, these resumed in 2010 (IMoEP Bay of Eilat National Monitoring Reports, 2009, 2010). Since the Israeli–Gaza conflict of July 2014, even research and monitoring cooperation between the Jordanian side and the IUI in Eilat⁶ has faltered. The bi-annual joint research boat tours that were started in 2003 stopped in September 2014 (Genin, personal communication, July 30, 2015; Shaked, personal communication, October 6, 2014). Overall the influence of regional tensions proved to be significant. The fact that only the joint monitoring elements of the RSMPP continued over time can be related, at least in part, to larger regional tensions and the official 'distancing' that has occurred between the two countries (Arieli, 2012; Cohen & Ben-Porat, 2008).

3. Success and failure factors and the four initiatives

Comparing the RSMPP to other initiatives that were outcomes of the 1994 Peace Accord in view of factors relevant to the success of TBPA highlights what is relevant to the success of the RSMPP. While the RSDSC and the joint efforts to prepare for oil spills have continued, the RSMPP and the AEMC lost momentum over the past two decades. How can this difference be explained? We review some aspects of the RSMPP program and its aftermath, using factors identified from the literature (Barquet et al., 2014; Mackelworth, 2012; Phillips, 1998; World Bank, 2007; World Conservation Union, 2001). Only those factors most relevant to the RSMPP (and not all listed in Table 1) are addressed in this section. These outcome-shaping factors, that promoted or impeded all four initiatives, are described. In the next section more direct comparisons to the RSMPP are summarized (see Table 2).

3.1. Profitability, funding and third party involvement

Public and stakeholder economic interests, (i.e. profitability) have been found to be central to the success of TBPA (Barquet et al., 2014; Mackelworth, 2012; Phillips, 1998; Sandwith et al., 2001; World Bank, 2007). Profit

Table 2. Project attributes according to current/expected factors.

Factor	RSMPP	RSDSC (planning)	AEMC	JOSCP
Profitability	Low	High	High	Low
Funding	External and government funding initially; currently minimal	Potential government and private funding	Local government	Government funded
Security issues	Partially problematic	Minimally problematic	Problematic	Minimally problematic
Third party involvement	Initially highly involved; currently minimally involved	Currently no third party funding	None	Partial (separate Israel and Jordan 3rd party treaties)
Long-term planning	Initially; not currently	Yes	Partial	Partial
Number of participants	Bilateral (Israel–Jordan)	Trilateral (Israel–Jordan–PA)	Bilateral (Aqaba-Eilat)	Bilateral and multilateral (officially includes Egypt and other states in the region)
Environmental status/crisis	Considered better since project began but still requires improvement; engenders a sense of urgency	Major potential environmental repercussions depend on the plan	Considered better since project began but still requires improvement	Potential oil spills could cause devastating harm to the Gulf
Transparency/public awareness	Low	Moderate	Low	Low
Motivation and commitment	Initially high; currently low	High governmental commitment and motivation (though hindered by tensions)	Initially higher, currently low (inactive since 2010)	High
Stakeholder interest	Initially high but currently low (except for scientists who are still highly interested)	High (though hindered by tensions)	Moderate for local government, low for businesses and public (until 2010)	High
Balance	Initially balanced, currently unbalanced	Slightly unbalanced	Slightly unbalanced as ASEZA is more autonomous than the municipality of Eilat	Balanced
Engagement	Initially high, currently very low	Moderate (Jordan)–high (Israel)	Moderate until 2010; currently low	Moderate–high
Promoting party	Initially both states and USAID, currently no clear promoting party	Both governments	Both local government institutions (until 2010)	Both governments
National efforts	Coincides with national efforts (environmental)	Coincides with major national efforts (energy, water and employment)	Coincides with national efforts (regional development, environmental, emergency forces)	Coincides with national efforts (environmental, public health)
Monitoring and evaluation	N/A	Planned	Low	Yes
Common goals	Yes (Environmental)	Yes (economic, regional stability, energy and water security)	Yes (regional development and stability)	Yes (environmental, public health)
Location	Peripheral	Peripheral	Peripheral	Exclusively peripheral (often at sea)
Type/level of participants actively involved	Professional (Scientific)	Highest political levels	Municipal (official and citizens)	Professional

is frequently derived from tourism, and can be a significant factor in supporting TBPA (Hammill & Besançon, 2007; Metcalfe & Kepe, 2008). Examples abound of NGOs, government agencies, for-profit organizations as well as the communities themselves, being potential economic beneficiaries of the establishment of such areas (Barquet et al., 2014; Metcalfe & Kepe, 2008), particularly where beaches and coasts are included within (Guerreiro et al., 2010). Profitability raises government interest in TBPA, which in turn can generate even further funding and investment.

The number and type of actors involved in the establishment of TBPA are known to influence the governments' willingness to establish and maintain cooperation with neighboring countries (Ali, 2007; Barquet et al., 2014). On the one hand, external parties support capacity building actions and provide funding (Mackelworth, 2016; Zimmer, 2001), however, on the other hand, third party involvement may be time-limited and thus hinder the maintenance of sustained efforts over the long term (Guerreiro et al., 2010). The RSMPP, the RSDSC project and the JOSCP all involved significant involvement of external parties, including for funding. For example, the Jordanian station and equipment established as part of the JOSCP were largely provided by Japan (IMoEP, 2014c). In the case of the RSMPP, the termination of significant U.S. involvement was likely key.

After tourism- and public-oriented activities of the RSMPP were halted in 2002 and the bulk of USAID funding ended,⁷ the project consisted of limited cooperation focusing almost exclusively on research activities. Scientists are paid through their universities and governments and therefore they were less dependent on the external funding and capacity building that came from third parties than profit-seeking entities, such as developers and business owners. Generally, researchers cooperate to improve their data and cooperation is an expected part of their work, especially where conducting such research is complex and expensive, as is usually the case for research conducted in the marine environment (Wilkinson, 2014). In a singular ecosystem area, such as the northern Gulf of Aqaba, lack of cooperation detracts from the value of research. Cross-boundary research value has also been highlighted in cases of other TBPA (see Hammill & Besançon, 2007).

The issue of funding and profitability differs in the other cases examined in this study. In the AEMC case, potential profitability of cross-border tourism cooperation (by municipalities or by the private sector) could have been high, but due to the lack of collaboration this opportunity was (and remains) unexploited (Arieli, 2015). In the case of the RSDSC, profitability and especially funding are both major issues. While profitable in the long run for all partners – Israel, Jordan and the Palestinian Authority – in the short term, very significant investment is necessary. With Jordanian support waning, private investment faltered as well (Barkat & Cohen, 2016).

For the JOSCP, some funding was received by Japan for the response station in Aqaba and for other equipment necessary for the collaboration (IMoEP, 2014c). However otherwise, collaboration, joint meetings and exercises are funded by each of the governments as work of the relevant national authorities. The profitability of the project is indirect though potentially substantial, as contamination of the Gulf would be costly for both states, both in terms of decreased tourism and in terms of cleanup costs that would be required to respond to an oil spill (Eli Varburg, head of the Eilat marine pollution prevention station, personal communication, November 6, 2016).

3.2. Security issues

Two ongoing security-related procedures have impacted Israeli–Jordanian cooperation efforts. Firstly, due to security concerns, Jordanian officials and business people have difficulty obtaining visas to enter Israel. Secondly, Israeli students are prevented from entering Jordan as part of school activities by official Israel Ministry of Education policy due to concerns for their safety. This creates substantial limitations on collaborative educational and scientific activity (Arieli, 2012).

Joint meetings necessary for academic cooperation are difficult to hold in Israel because of the difficulty for Jordanian nationals to receive entry visas, therefore most joint scientific meetings are held in Jordan (Sadeh, 2015). Additionally, although Israelis can legally cross the border into Jordan to dive in Jordanian Red Sea natural reserves, due to the Israel Ministry of Foreign Affairs' travel warnings about the dangers involved in visiting

Jordan, which are issued very frequently in recent years, the IUI chooses not to send researchers to do field work without their Jordanian counterparts accompanying them (Genin, personal communication, September 30, 2014). Such conditions reinforce the 'problematique' of TBPA's where conflicts remain, thus limiting the types of activities that can occur within them (Elliott, 1996; Hammill & Besançon, 2007).

We can learn of a possible solution, albeit one adopted too late to make a difference in the overall outcome, if we examine the case of the AEMC. Cooperation clearly suffered due to the difficulties pertaining to border crossing. While visas to Jordan were given at the border crossing, Jordanians wishing to cross into Israel needed to obtain a visa in Amman. This added to the uncomfortable procedure of crossing into Israel from Jordan and decreased Jordanians' motivation to do so. As a solution to the situation, based on an agreement signed between Israeli and Jordanian authorities in 2008, special VIP status was given by Israel to a list of 150 Jordanian officials, providing them with multiple entry visas (Arieli, 2012, 2015). Due to other factors, this step has been 'too little, too late' in case of the AEMC (Arieli, 2015).

For the JOSCP project, Jordanians taking part in the collaboration for preventing oil spills and response planning are given visas using an expedited process. The Israeli response station also reached an understanding with the Israeli navy that allows border crossing by sea which simplified matters considerably (Varburg, personal communication, November 6, 2016). This solution takes advantage of the close geographic position and the porous marine jurisdictional boundary between the countries, thus easing the means of collaboration.

3.3. Balance

In the RSMPP case, the balanced relationship between countries known to be important for the creation and maintenance of TBPA's (see Mackelworth, 2012) evolved into an imbalance. The U.S. government interest expressed through the efforts (and monetary support) of the USAID was large enough that an imbalance resulted. This impacted success over time when these efforts waned. While the Jordanian Royal Marine Conservation Society (with connections to the Jordanian royal family) was interested in supporting the RSMPP, the effort lacked high-level government support on the Israeli side which later led to an imbalance between the two countries themselves.

An imbalance also occurred due to large-scale national politics that caused Jordanian researchers to be less cooperative with their Israeli counterparts on the ground. In the Israeli case, scientific collaboration efforts are openly supported, financially and otherwise, by the government (Genin, personal communication, September 30, 2014; Shaked, personal communication, October 6, 2014). This is also the case for other joint environmental projects between Israel and Jordan, such as the JOSCP (IMoEP, 2014c). But now, current research cooperation is to a great extent non-official, following a trend since 2004. Funding is now from external sources on both sides and available in differing amounts, leading to a new kind of balance and one that is focused on research and less concerned with general monitoring (Genin, personal communication, September 30, 2014; Genin, personal communication, July 30, 2015; Shaked, personal communication, October 6, 2014).

In the case of the AEMC, some imbalance was caused due to the above mentioned difference in visa-related procedures between Israeli and Jordanian authorities, causing it to be more difficult for Jordanians to cross over to Israel in comparison to the ease with which Israelis were able to enter Jordan. Yet another type of imbalance is caused by the different levels of autonomy between the Eilat and Aqaba local governmental regimes. The Jordanian ASEZA which functions as a local municipality, enjoys more autonomy than the Eilat municipality which is subordinate to the Israeli Ministry of Interior. Even the foundation of the Department of Regional Cooperation, established by the Eilat municipality, and supported by the Israeli Ministry of Foreign Affairs (Arieli, 2015), did not lessen this imbalance sufficiently to improve the AEMC. In the case of the JOSCP, a relatively good balance is maintained due to the fact that communications, at least for operational matters, are maintained between the 'ground people' (Amir, The marine environment protection division is part of the Department of Enforcement of the Ministry of Environmental Protection, personal communication, November 3, 2016; Varburg, personal communication, November 6, 2016).

3.4. Common goals

A shared culture and vision leading to common goals of collaborative efforts is a factor important for trans-boundary environmental initiative success. For example, in southern Africa, conservation projects have often been linked to the dreams of a reunited Africa, which offer a shared vision (Barquet et al., 2014; Van Amerom & Büscher, 2005). By contrast, in Latin America, the progressive decline of transboundary cooperation has been linked to countries' interest in distinguishing themselves from one another, thus emphasizing a lack of a shared vision (Barquet et al., 2014; King & Wilcox, 2008; Wakild, 2009). For Israel and Jordan, there is currently a similar interest in moving apart and making distinctions.

Other than for Palestinian populations living in both Israel and Jordan, the two countries lack a common culture and/or heritage (Kliot, 1997). However, a common vision could be regional prosperity and stability in the Middle East (Arieli, 2012). Nevertheless, such aspirations have been undermined by the current-day tensions between Israel and the Palestinians, by avoidance of any formal cooperation with Israel to align with Jordanian public opinion and in other cases by discouraging treatment of Jordanians through Israeli official channels, sometimes due to security concerns.

A common vision for the RSMPP focused on the creation and maintenance of a healthier environment and the protection of natural resources; this had momentum in the early years of the program when the marine environment was quickly deteriorating. The need for joint efforts to save the reefs, perceived as a valuable and unique natural asset by both states, was clear (see Figure 1). As mentioned, marine boundaries, as opposed to terrestrial ones, are vague and not easily delineated by fences and other barriers (Agardy, 2000). This can promote feelings of ownership between adjacent jurisdictional authorities beyond those determined by frontiers and borders (Elliott, 1996; Hammill & Besançon, 2007; Mackelworth, 2012); it did so in the early years of the RSMPP, but mainly related to averting an immediate environmental crisis (see Section 3.5) and its detrimental repercussions (financial and otherwise) to the population and to tourism in the Gulf. Such considerations and common values that lead to the adoption of common goals still apply today for the JOSCP case.

In the case of the RSDSC, the shared vision has to do both with regional stability as well as regional development and prosperity as not only Israel and Jordan, but also the Palestinian Authority, is meant to collaborate with and benefit from the initiative. The RSDSC aims not only to solve part of the region's potable water shortage, but also to establish an additional source of (renewable) energy and to potentially reverse the trend of the Dead Sea's decreasing water levels for the benefit of the two countries which share the sea as a natural heritage site (Fischhendler, Cohen-Blankshtain, Shuali, & Boykoff, 2015).

3.5. Environmental crisis

Urgent environmental crises play an important role in collaborative efforts between the two states for three projects out of the four that we examined: the RSMPP, the RSDSC and the JOSCP. It is clear that a sense of urgency to stop the deterioration of the coral reefs of the northern Gulf of Aqaba perceived as a severe regional environmental problem by scientists and most stakeholders, engendered motivation for the initial bi-national cooperation to establish the RSMPP (Portman, 2007; Zimmer, 2001). While the environmental status of the coral reefs addressed by the RSMPP has shown some improvement, and deterioration trends have slowed, the environmental urgency in averting oil spills and providing fresh water has remained constant.

For the RSDSC case the most important issue is water supply, also considered an urgent environmental crisis. The shortage of available drinking water is a regional problem and it has been the source of much controversy, even within the larger Arab–Israeli conflict (Elliott, 1996). While Israel has made significant recent advances in water independence by the use of water-saving practices and technologies (e.g. desalination), the situation remains dire in Jordan. For Jordan solving the water crisis is a national priority and Jordan has sought outside help to address the issue (Arieli, 2012; Atwi & Chóliz, 2011; Aviram, Katz and Shmueli, 2014). The JOSCP also clearly relates to averting environmental (quality) catastrophes (see Section 1.3.2).

If anything, in the RSMPP case, improved environmental status reinforced the importance of continued monitoring. Rehabilitation of the degraded corals began to occur in the late 2000s and the data gathered during the initial stages of the program was of significant importance (Genin, personal communication, September 30, 2014; Shaked, personal communication, October 6, 2014). Yet, continuing the RSMPP would have become a financial and political burden on the countries once external backing ended and environmental quality improvements were detected. Indeed, over the last two decades, once the full-blown crisis had been averted, the RSMPP went from being an asset to being a liability.

3.6. Stakeholder interest

The types of entities, their number and level of interest in a transboundary environmental initiative are among the factors significant to the success of TBPA. Scholars have pointed out that TBPA often work best if local communities are involved in planning and management (Agrawal, 2000; Metcalfe & Kepe, 2008; Van Nijnatten, 2003). By and large, the peace process between Israel and Jordan was made between two regimes, and therefore characterized as top-down ‘peace from above’ (Kliot, 1997). Entities working to keep the RSMPP program going ended up being made up mostly of marine scientists who attributed great value to joint scientific research on the northern Gulf of Aqaba. This matches Hammill’s and Besançon’s (2007) finding that if cooperation is perceived as highly beneficial and outweighs costs or burdens, then that form of cooperation will survive.

In cases of transboundary environmental protection, scientific collaboration has contributed to a separate level of contact and peace-building between countries (e.g. Barquet, 2015; Wolmer, 2003). Similarly, the 1990s Ozone Annex cooperation between Canada and the U.S. created a bi-national epistemic community of scientists and environmentalists. From an analysis of the events surrounding this agreement, Van Nijnatten (2003) found that less visible forms of cooperation, on different local and institutional levels, as well as those between epistemic communities, are a significant part of the U.S.–Canada environmental narrative. Another more recent case is that of Cuba and the U.S.; scientific collaboration was one of the first types of cooperative actions to take place once relations were reestablished between the two countries after many decades of complete disengagement (Wilkinson, 2014).

Stakeholder interest can be influenced, and even determined, by the visibility level of a program. In both countries, the Gulf of Aqaba is far from the center of the country (in particular, from their respective capitals Amman and Jerusalem) where political and religious-related tensions are high. Having high-profile national stakeholders less interested in the RSMPP, accompanied by a commensurate low profile in the media (Arieli, 2012), aided some aspects of the program. Remoteness from the center and a low profile in the media, also aided in the case of the AEMC (Arieli, 2015) and the JOSCP (Amir, personal communication, November 3, 2016). The case of the RSDSC, however, is different. Media coverage of the initiative involves relatively high-level representatives, even ministers, who publically support the collaboration (Fischhendler et al., 2015). On the Jordanian side, in the case of the RSDSC, the perception of the intended project benefits (i.e. solving the extreme water crisis) justifies collaboration with Israel and therefore visibility has not hindered the project.

3.7. Attention related to political tensions

Environmental problems often cannot be solved in isolation of geopolitical conflict and are usually not a sufficient condition to overcome political deadlock (Ali, 2007; Elliott, 1996). Yet environmental (and scientific) information sharing occurs through different, subliminal lines of contact regardless of political situations and events, sometimes far from the public eye (Van Nijnatten, 2003). Furthermore, Wolmer (2003) contends that when TBPA involve politically sensitive situations on a local, national, regional or international level, there is a need to proceed slowly and cautiously, to avoid political ‘grandstanding’ and media attention that might hinder collaboration. Yet at the same time, avoidance of public attention curtails the ability to translate cooperative achievements of environmental programs into meaningful and large-scale political progress, another ‘problematique’ of TBPA in areas of conflict (see Barquet, 2015).

The large-scale Israeli–Palestinian conflict affected the RSMPP and the AEMC cooperation negatively. For these projects, the reluctance of Jordanians to be perceived as openly cooperating with Israelis hindered realization as national relations between the two countries deteriorated (Arieli, 2012, 2015). However, the RSDSC and the JOSCP have been less affected, despite significant political attention (Al-Khalidi, 2015; Varburg, personal communication, November 6, 2016). We would therefore benefit from studying what other characteristics the projects had or did not have in view of conflicting information discovered regarding this factor. Particularly, we found that for the RSDSC case, the highest political levels on both sides have been involved (Fischhendler et al., 2015), while in the JOSCP case, the higher political echelons are for the most part, not involved; the collaboration takes place between professionals rather than politicians (Amir, personal communication, November 3, 2016; Varburg, personal communication, November 6, 2016).

4. The RSMPP compared

Six factors mentioned in the literature and based on previous case studies are particularly relevant in the RSMPP case (see Table 1). They are: (1) *funding* (mostly from the U.S. government in the early stages); (2) *third party involvement* (e.g. the U.S., the World Bank); (3) *security issues* (e.g. border crossing difficulties); (4) *common goals* (e.g. regional development and stability); (5) *environmental crisis* (i.e. urgent need for action); and (6) *stakeholder interest* (i.e. particularly of marine scientists). Some of these factors improved the chances of the RSMPP success (e.g. third party involvement), whereas others (e.g. security issues) hindered progress. Almost all of them advanced the program for some time (e.g. funding), and hindered it when circumstances changed (e.g. balance). These six factors are mentioned above as sub-sections of Section 3.

The last sub-section, addressing political tensions (Section 3.7), leads to the identification of two distinct additional factors not found in the literature yet related to success/failure of the RSMPP. The first relates to the project's *peripheral location* which facilitates cooperation on one hand, yet limits the program's potential to influence general regional political discourse on the other. This is similar to the factor of political tensions related to scalar projects (as mentioned by Barquet, 2015), but with an additional geographic *spatial* component (i.e. distance from the national center). The second involves the *level of cooperation*, that is, the civic or political levels of the parties most involved in the initiative, as described below.

The peripheral geographic location of the Israeli–Jordanian initiatives is an advantage when it comes to successful cooperation because it leads to less visibility and therefore greater chance of success (Wolmer, 2003). In addition to geographic distance, activities, particularly for the JOSCP and RSMPP, are further away from the public eye because they take place in the marine environment which is less in the public's purview and understanding than the terrestrial environment (Portman, 2014; Steel, Smith, Opsommer, Curiel, & Warner-Steel, 2005). For example, as mentioned in the JOSCP case, border crossings take place at sea, which removes an obstacle that has burdened other forms of Israeli–Jordanian transboundary cooperation.

As for the governance levels in which the cooperation takes place, we find great variability among the different projects. In the case of the RSMPP, cooperation at higher political levels decreased dramatically, while communication and collaboration between the people 'on the ground', scientists and professionals, kept parts of the initiative alive. This was also the case for the JOSCP, arguably the most successful initiative we analyzed, as it is still fully active today and, unlike the other three initiatives, was at no point halted since its inception in 1995 or weakened due to political tensions. The AEMC, where Israeli and Jordanian committees met frequently for several years (although effectively ceased to convene after 2010), featured a similar type of 'on-the-ground' cooperation regarding municipal concerns relevant to both Aqaba and Eilat. However, these were more visible; meetings took place on a semi-political level because active committee participants included many professionals serving in their areas of public sector responsibility (Arieli, 2015).

The RSDSC project has been highly visible to the public, unlike the other three described, but as mentioned, there are the substantial benefits expected not only to the relatively peripheral locations in which the project will take place (in Aqaba and in the desert), but also for the entire population because both parties see it as supporting important national goals: in Jordan it is first and foremost the provision of fresh water, while in Israel it is the normalization of ties with Jordan and improving regional stability. Other common goals are job provision

for people in the area, hydropower, and rehabilitation of the Dead Sea, although scientists disagree regarding whether the latter is likely to occur if the RSDSC plan is implemented in its present form. However, as this project, in comparison to the others, is still in its early stages, it is unclear whether this particular collaboration can be described as successful.

There is no question that the continued success of the JOSCP, the continued work on the RSDSC and the partial success of the RSMPP, as transboundary environmental initiatives, are tied to threat of an environmental crisis. The environmental motives for protection of the marine area of northern Gulf of Aqaba in 1994 centered on recognition of the unique and sensitive resources that were on their way to becoming a degraded 'sink' for pollutants and ultimately a 'dead zone' (Abu-Hilal & Al Naijar, 2004; IMoEP website, 2014b; Portman, 2007; Zimmer, 2001). Environmental degradation would not only have damaged the unique ecosystems of the area, but also would decrease opportunities for tourism, recreation and general economic development, all frequently common goals of TBPAAs (e.g. Mackelworth, 2012; Metcalfe & Kepe, 2008). While environmental well-being could also have been improved by the AEMC, the initiative was not necessarily aimed at averting a palpable crisis and therefore interest waned even sooner than it did for the RSMPP.

5. Conclusions

Despite halts since 2014 in joint monitoring efforts as a result of political tensions related to the Palestinian–Israeli conflict, the RSMPP initiative has achieved *partial* success. Thus the case has important lessons, especially for similar situations where conflictual relationships exist between countries, even despite the existence of peace agreements. The RSMPP as a whole did not come to fruition and the program officially ended more than a decade ago, but it has had a lingering effects and a limited but active legacy, particularly with regard to scientific advancement and environmental protection. Research-based recommendations achieved the cooperation that began in order to establish the park and have helped bring about small changes in policy that minimize harmful effects to marine ecosystems in the northern Gulf of Aqaba. Most significantly, the status of the corals has improved since the advent of the RSMPP and current data show that this trend continues (Genin, personal communication, July 30, 2015; IMoEP, 2014a).

Our study found main two main factors leading to the partial success of the RSMPP which are not emphasized thus far in the TBPA literature. Firstly, environmental collaboration initiatives in a region where there is much political controversy, experience some advantages from being located in a peripheral geographic area of a country. Secondly, cooperation consisting mainly of scientific activities, taking place 'on the ground' and 'behind the scenes', can be durable despite continued tensions on higher diplomatic levels. Both these factors have to do with keeping a low-profile and emphasizing work between professionals as opposed to politicians. A final known factor that requires emphasis, relates to the threat of environmental crisis. The degraded environmental status of the northern Gulf's extraordinary marine ecosystem loomed threatening enough to maintain cooperation for improved (or at least stable) environmental quality and thus supported one of the goals of the RSMPP for some time. Comparative analysis of the four environmental cross-border initiatives has demonstrated that these factors, in addition to other factors previously found to influence TBPA success (third party involvement, visibility, common goals, urgency and security) are particularly relevant for protected areas proposed across marine borders between countries with a history of conflict.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. To use the definitions of Martin, Rutagarama, Cascão, Gray, and Chhotray (2011), medium-level transboundary environmental cooperation includes collaboration and coordination between local and national authorities, with joint planning that

- receives high-level political support, but is subservient to national planning. Low-level cooperation includes some communication between authorities, such as short-term actions, limited consultation and mutual updates on activities and results.
2. The IMoEP financed Israel's response center, the Jordanian center was funded by a Japanese contribution and Egyptian efforts to do the same were backed by the European Commission.
 3. Sadeh (2015) reviews two other proposed TBPA's between Israel and its Arab neighbors: a proposed peace park in the South Sinai Peninsula, as part of a wider nature conservation effort that followed Israeli-Egyptian peace negotiations; and a more recent set of proposals (1994–2009) to establish a peace park in the Golan Heights, as part of negotiations (some informal) between Israel and Syria.
 4. The Gulf of Eilat is the Israeli name for the Gulf of Aqaba.
 5. The municipality's economic development authority.
 6. The monitoring program, in which some IUI researchers participate, is sponsored by the IMoEP.
 7. The main original financing third party, USAID, has been disconnected from the project in recent years, thus contributing to the decreasing level of cooperation although it does still continue to support annual meetings between Israeli and Jordanian Red Sea scholars (Genin, personal communication, September 30, 2014).

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