

NETWORK ANALYSIS OF REGIONAL ACTORS IN THE EAST ASIA REGION BASED ON A REVIEW OF LITERATURE

DECEMBER 2011¹

Introduction

Network analysis is a tool used to describe and examine the interactions among actors in a defined population, as well as to explore the patterns that may emerge from these interactions. It does not, however, explain why these patterns have emerged, nor does it predict what patterns will form in the future. This network analysis of regional actors serves as an input to the Impact Evaluation of GEF Support to the South China Sea and Adjacent Areas.

Objective and focus questions

As GEF is only one of a myriad of actors operating in the South China Sea, it is important to analyze the larger institutional context through which the countries bordering the South China Sea generate global environmental benefits. This network analysis of regional actors sought to answer the following questions:

- 1) Which actors are most relevant in the context of regional environmental governance?
- 2) What is GEF's role and position among the population of actors?
- 3) To what is GEF's role similar/ dissimilar to those of other actors?

Although questions on changes in actor relations over time and the nature of these relations are important, these are not included here due to insufficient information available to answer these questions. Patterns of interaction emerging from the characteristics of each actor, and based on similarities in their position in the network were also explored but did not produce significant findings.

Scope and limitations

The analysis considers only actors with interactions or interventions at the regional scale. As such, there may be actors of high importance at the country level (e.g. bilateral donors) that are not included². Furthermore, the actors were selected based on their perceived importance by stakeholders in the region (see Methodology below), rather than their actual impacts, scope of environmental concerns, or level of funding. For the same reason, this analysis does not attempt to make a comprehensive recording of actor relations. The conclusions of this analysis must therefore be taken with these limitations in mind. The results are only indicative of the actual structure of the network, and are complemented by information gathered through interviews and case studies³.

¹ For questions, please email Jeneen R. Garcia at jgarcia2@thegef.org.

² A separate analysis has been done on bilateral donors working at country level, and their relationship with GEF as cofinancers of projects. A discussion on GEF's cofinancing partners is included in the annex.

³ A separate analysis has also been done using information collected from a survey of the 15 most highly connected actors from this analysis.

Summary of findings

- Of the 46 actors, 66% have an equal or almost equal number of inward and outward ties, indicating that most regional actors have a function of both providing and receiving resources. Over-all, 48% have high reciprocity (i.e., at least half of its ties are reciprocal), which means that they provide resources to the same actors that they also receive resources from. This indicates that no one actor dominates, and that no actors are completely dependent on any other.
- Six actors were identified as being critical to keeping different groups of actors connected to the rest of the network: ADB, ASEAN, IUCN/WCPA, NACA, UNESCO/ IOC/ WESTPAC and PEMSEA. Except for NACA and IOC/ WESTPAC, each of these actors also has direct ties with an average of 29% of the actors in the network.
- GEF is the highest net provider of resources. Despite the limited number of actor types that GEF has direct ties with, it is well-connected to almost the entire network due to the wide range of actors that have ties to GEF's immediate network. This particular set of partners (i.e., implementing agencies, executing agencies and cofinancers) makes GEF's position strategic in mainstreaming its global environmental objectives in the regional agenda.

Methodology

Defining the population

To generate the list of actors to include in the analysis, literature with the specific objective of providing a review of regional actors/programs involved in environmental issues were used in lieu of surveys. An internet and library search yielded 10 such independent sources published between 1993 and 2010 (see Table 9 in Annex). Actors that were mentioned in at least two of these reviews were included in the analysis. Except for the United Nations (UN) agencies, actors that represented different departments or offices of the same institution were considered the same entity (e.g. the different working groups of the ASEAN), unless they were of a different nature from their parent organization (e.g. UN and UN Foundation). Countries were included as regional actors only in their function as bilateral donors. Different channels for aid delivery were consolidated under their respective countries (e.g. USAID and NOAA for USA).

For the purposes of this analysis, an "actor" is defined as an entity that has a governing body and an organizational structure to manage itself, implement its own programs, and make decisions independent of its original founders, external funding sources, and fixed time periods. Examples of actors that were originally initiatives but have become independent entities are ADB, PEMSEA, COBSEA, MRC and SEAPOL. By this definition, no projects and programs were considered as actors, despite their extensive involvement in environmental affairs or their leadership by intergovernmental steering committees (e.g. Yellow Sea LME project, UNEP-GEF SCS Project).

Scoring and analysis

Ties between actors were identified through the information given in the same 10 sources. As such, this analysis does not include ties that may exist, but were not mentioned in these sources. Due to the limited information available, ties were only recorded as present ("1") or absent ("0"), and were not classified according to their nature or strength.

The actor matrix drawn was asymmetric/ directed, i.e. the ties between actors were not necessarily mutual. A tie was counted as “1” if the actor was an initiator of an intervention or a provider of resources (funds, technical advice, coordination), and “0” if the actor was the implementer of an intervention or receiver of these resources. An actor was counted as a provider of resources rather than an implementer of an intervention if the relationship resulted in contributions to the other actor’s objectives, without itself benefiting financially or technically from the contribution. If the actor initiated an intervention or provided resources but benefited from this relationship (e.g. funding for its own programs), then the actor was counted as an implementer/ receiver. If the tie was an explicit agreement or partnership, regardless of the actual resources exchanged, a score of “1” was given to both actors connected by the tie.

Table 1 summarizes the criteria used for scoring the ties between actors. Ties were counted for interactions that were generally programmatic, sustained, or frequently repeated. If the interaction was an ad hoc activity or had yet to take place, no tie was counted.

Table 1. Criteria for scoring actor ties

ROLE	No financial or technical benefit in return	Received funds in return and/or only own programs implemented	Formal partnership
Provider of resources	1	0	1
Initiator of intervention	1	0	1
Receiver of resources	NA	0	1
Implementer of intervention	1	0	1

Microsoft Excel 2007 and the network analysis and visualization software UCInet 6.289 / NetDraw 2.097⁴ were used to analyze actor relations and produce the graphs.

⁴ Borgatti, S.P., Everett, M.G. and Freeman, L.C. 2002. Ucinet for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.

Results and Discussion

Relevant regional actors

A total of 46 actors were identified to be part of the population that was analyzed (see Table 6 in Annex). The actors are positioned in the graph optimally to achieve equal tie lengths, while maintaining distance as a function of similarity (i.e., actors that are farthest apart are the most dissimilar, Figure 1). Reciprocal ties (double-headed arrows) indicate either a formal partnership or collaboration on the same or different interventions.

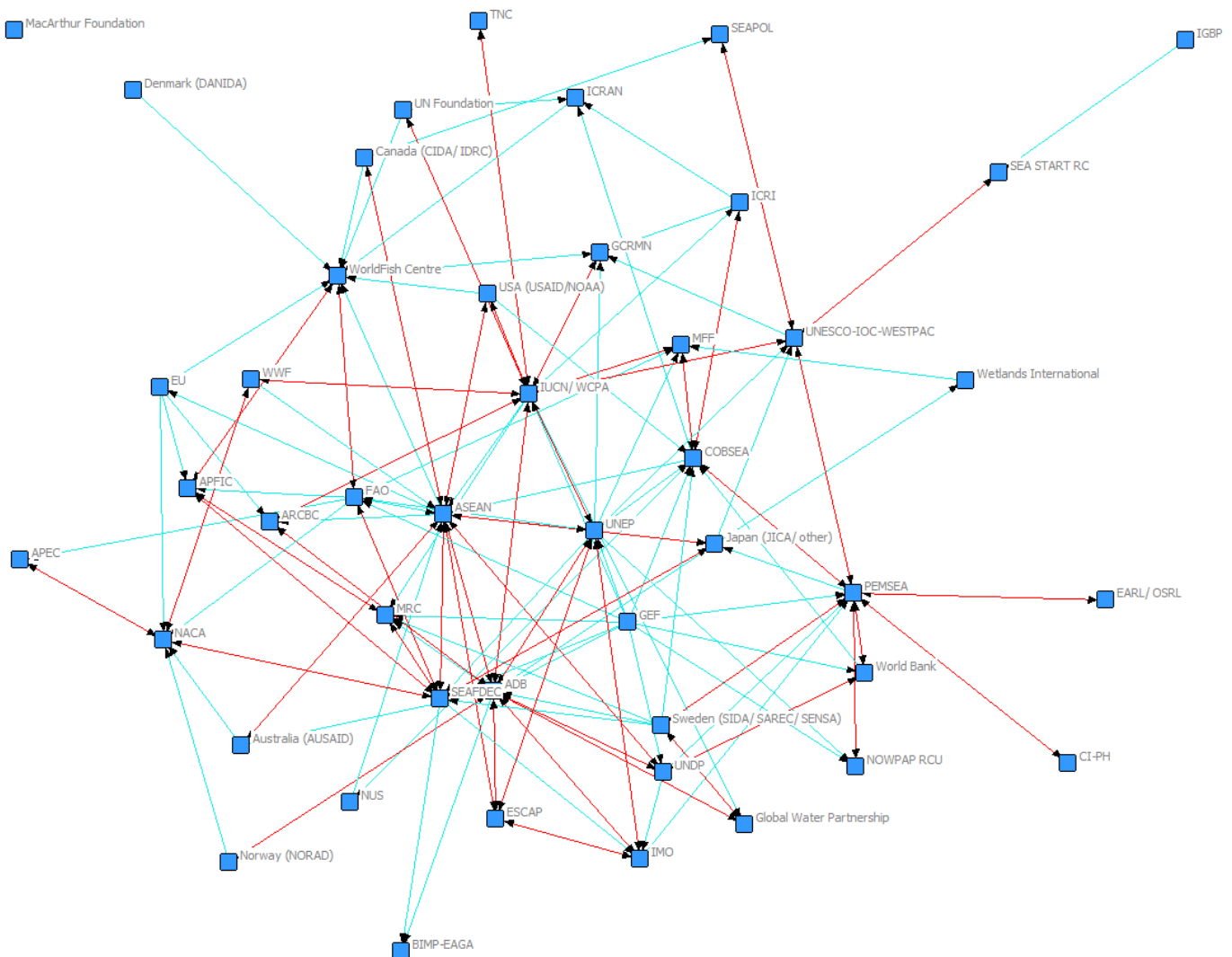


Figure 1. Network of actors showing reciprocal (red) and non-reciprocal (aqua) ties

Table 2 shows the number of undirected, inward and outward ties recorded for the 17 most highly connected actors (i.e., connected to at least 6 other actors). Based on the number of recorded inward and outward ties, most of the regional actors identified are net “collaborators” (42%), followed by net “facilitators” (24%), then by net “providers” (20%) and net “receivers” (13%) (Figure 2).

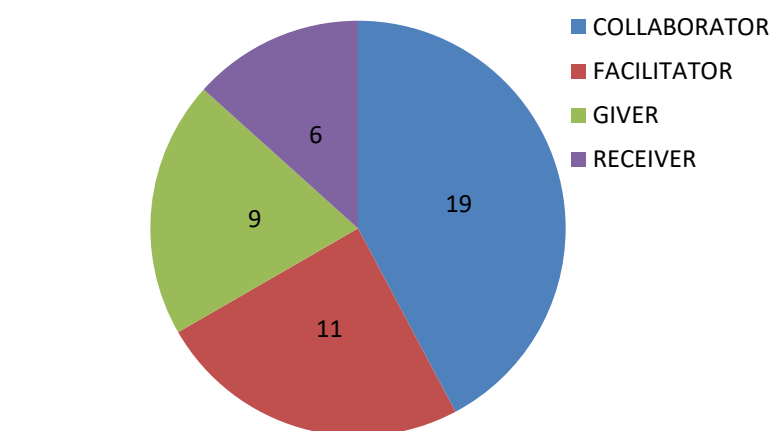


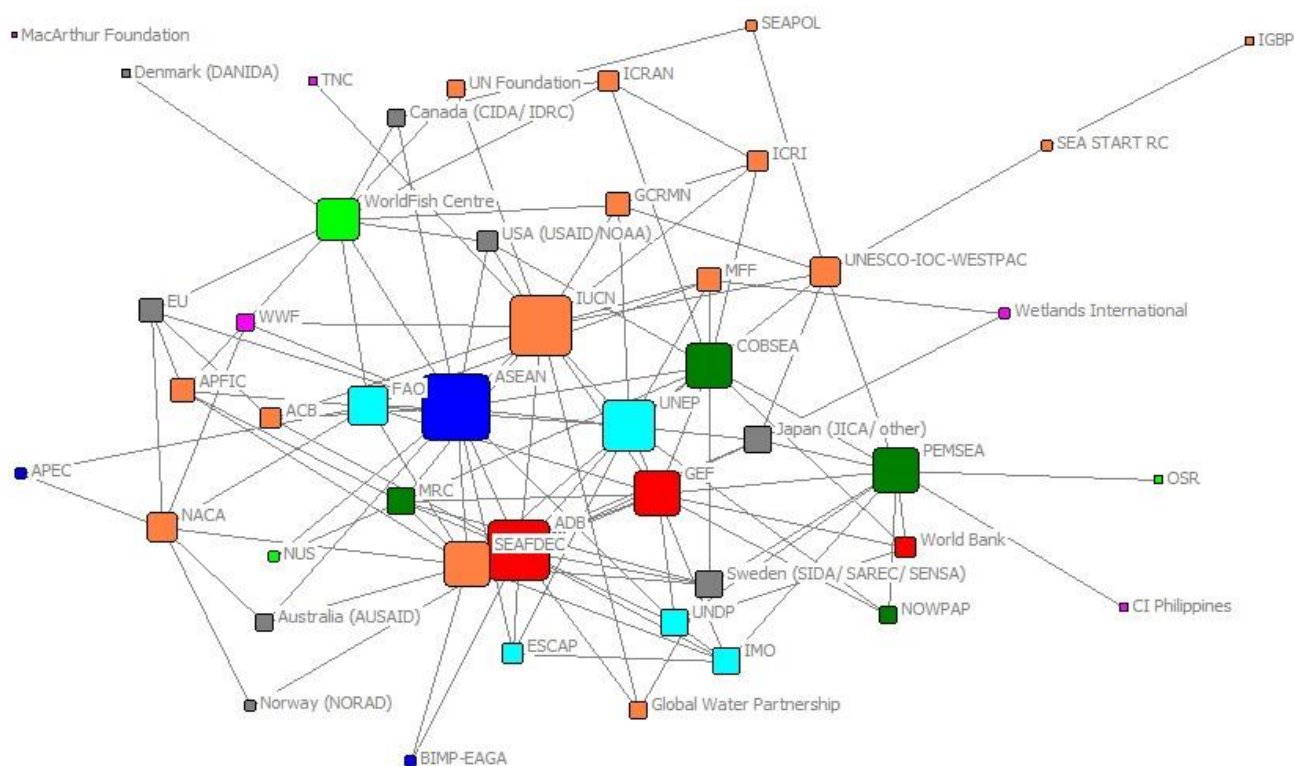
Figure 2. Roles of actors based on number of net inward and outward ties

The criteria used for classifying the actors according to these roles can be found in the Annex (Table 7). “Collaborators” are actors that generally operate through partnerships in implementing their own programs; “facilitators” are actors that generally have an equal number of inward and outward ties, and with few or none of those ties being reciprocal. This means that facilitators operate by receiving resources from one actor and providing them to a different one, though not necessarily for the same initiatives. Only one actor, MacArthur Foundation, was found to have no ties with any other identified actors. It is not included in the classification. GEF is the highest net provider, with 11 outward ties, and no inward or reciprocated ones (Table 2). That 66% of actors have an almost equal number of inward and outward ties shows that most regional actors are interdependent, and no single organization dominates in either providing or receiving resources.

Table 2. Number of ties of each actor to other actors (degree centrality measure, undirected ties ≥ 6)

ACTOR NAME	Degree	Inward	Outward
ADB	15	13	11
ASEAN	14	10	12
IUCN/ WCPA	14	11	13
COBSEA	11	8	6
GEF	11	0	11
PEMSEA	11	10	8
SEAFDEC	11	9	8
UNEP	11	6	10
WorldFish Centre	10	9	3

ACTOR NAME	Degree	Inward	Outward
FAO	7	3	6
NACA	7	7	3
IMO	6	5	4
Japan (JICA/ other)	6	3	5
MRC	6	6	2
Sweden (SIDA/ SAREC/ SENS)	6	2	6
UNDP	6	4	5
UNESCO-IOC- WESTPAC	6	5	5



The primary function of each actor was identified, resulting in eight categories. Table 8 in the Annex has the full list of actors and their functions, as well as their number of undirected ties. No significant patterns of interaction were seen based on different actor characteristics or their similarities and positions in the network.

Cutpoints are actors that, if removed, would result in parts of the graph being disconnected from all the others. These actors may be seen as critical for engaging other sectors in the regional arena in coastal and marine governance, and/or for integrating various regional initiatives that otherwise would be independent and isolated into a more systematic program with unified objectives.

Six cutpoints have been identified through the analysis: ADB, ASEAN, IUCN/WCPA, NACA, PEMSEA and UNESCO/IOC/WESTPAC (Figure 4). Since their absence would mean leaving other actors no other access to the rest of the network, this suggests that these cutpoints generally do not have ties to the same actors, as confirmed by their relatively low similarity (Figure 4).

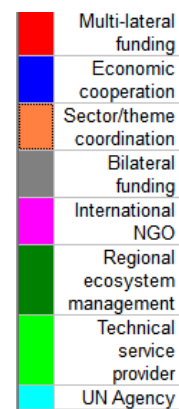


Figure 3. Network showing degree centrality (size of squares corresponds with no. of undirected ties) and primary function of actors

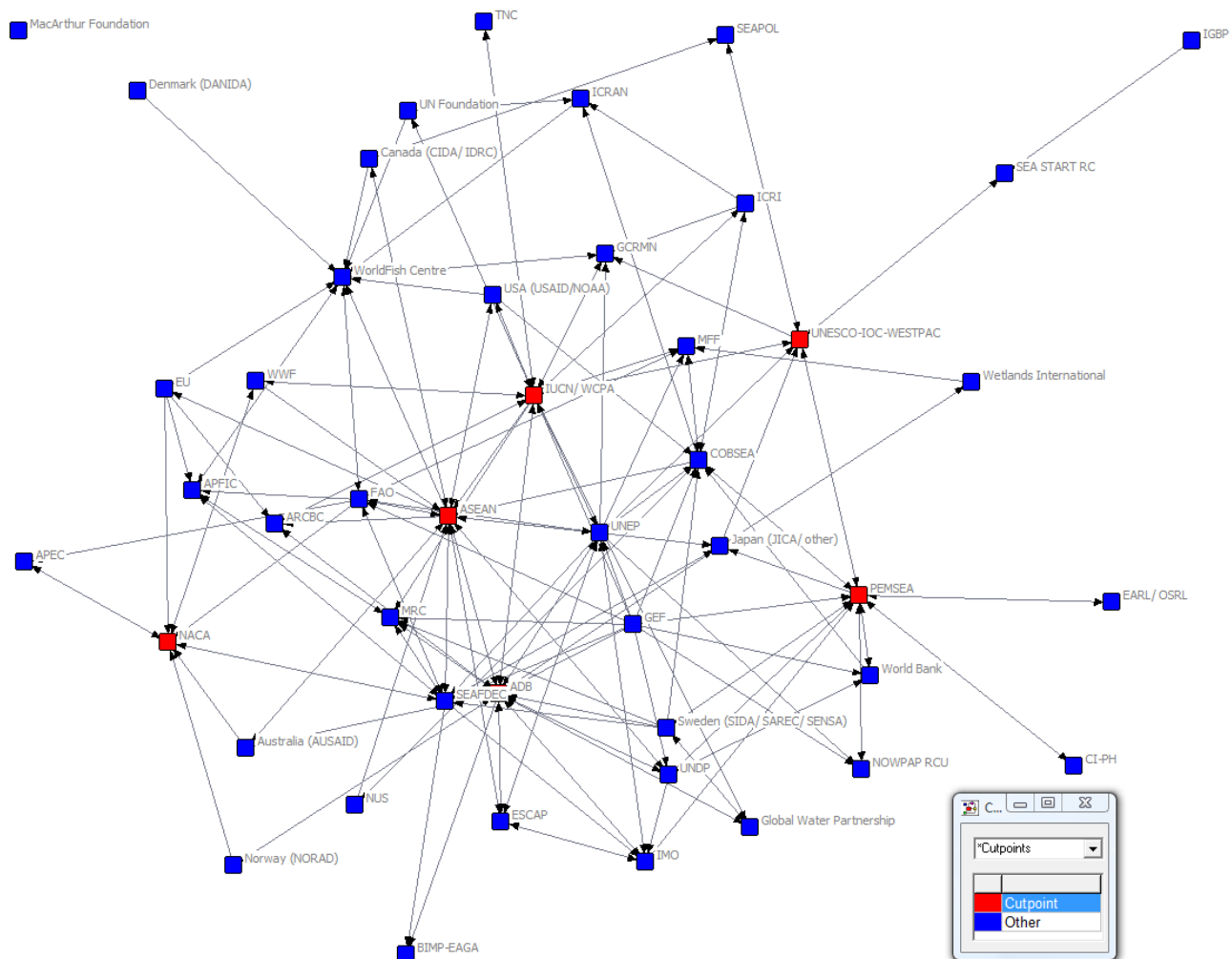


Figure 4. Regional actors identified as cutpoints

Table 3. Percentage of actors mutual to cutpoints (Jaccard similarity measure)

		ADB	ASEAN	IUCN/ WCPA	NACA	PEMSEA	UNESCO- IOC- WESTPAC
OUTWARD	ADB	--					
	ASEAN	23.5%	--				
	IUCN/ WCPA	27.8%	19.0%	--			
	NACA	0.0%	7.1%	6.3%	--		
	PEMSEA	0.0%	5.3%	4.8%	0.0%	--	
	UNESCO-IOC- WESTPAC	6.7%	0.0%	6.3%	0.0%	0.0%	--
INWARD	ADB	--					
	ASEAN	31.6%	--				
	IUCN/ WCPA	15.8%	20.0%	--			
	NACA	11.1%	23.5%	5.9%	--		

	PEMSEA	21.1%	9.1%	10.5%	0.0%	--	
	UNESCO-IOC- WESTPAC	18.8%	17.6%	7.1%	0.0%	0.0%	--

The first three actors are also connected to the highest number of other actors, with ADB connected to 15 others, and ASEAN and IUCN/WCPA each connected to 14 (Table 2). This means that although each of these three actors is connected to approximately 32% of all other actors in the analysis, the highest percentage of actors that they have in common is less than 28% for outward ties (giving resources), or no more than 8 mutual actors for any pair, as highlighted in Table 3. For inward ties, ADB and ASEAN have the highest number of resource providers in common at 31.6%, or no more than 9 actors.

Role of GEF in the context of other actors

Since GEF has only outward ties and no inward ones, it was compared only with other actors in terms of outward degree centrality (i.e., number of outward ties). Table 4 lists the five actors with the highest number of outward ties. Only GEF and ADB are similar in terms of primary function (multilateral funding), which indicates that the role of the actor does not correlate with the number of ties that it has.

Table 4. Comparison of actors with high outward degree centrality

ACTOR	NO. OF OUTWARD TIES	% REACH AT 2 ^o SEPARATION	% SIMILARITY W/ GEF	NATURE OF CONNECTIONS
ADB	11	73%	24%	Mostly UN agencies and bilateral donors
ASEAN	12	67%	21%	Whole range of actor functions
GEF	11	80%	--	UN agencies, multilateral donors, and regional management bodies
IUCN	13	78%	14%	Mostly other networks
UNEP	10	80%	38%	Mostly other UN agencies

GEF has the highest number of receiving actors in common with Sweden (SIDA/ SAREC/ SENSA), with 41.7% of their outward ties connecting to the same actors. Given that Sweden is connected to only 6 actors, this means that all but one of its ties are with actors that GEF also works with. GEF and Sweden, however, are shown not to be connected to each other. Sweden is indirectly linked with GEF through PEMSEA, which is a GEF project. A separate analysis of cofinancers of projects in GEF's SCS portfolio (see Annex) further reveals that SIDA has cofinanced three GEF projects in the region, which is not documented by the literature sources used in this analysis.

Other actors that have relatively high similarity in outward ties with GEF (20% to 38%) are already directly receiving support from GEF as implementing and executing agencies. These include ADB and UNEP. GEF is also linked to IUCN through its cofinancing for two GEF projects in the SCS portfolio. The only actor in the top five that has no direct links with GEF is ASEAN (21.1% similarity). Interestingly, it

has partnerships with actors that GEF also works with. This could be an opportunity for future collaboration.

GEF is connected to 80% of all other actors in the network by only two degrees of separation. This includes all 15 actors with the highest degree centrality, not counting PEMSEA (Figure 5). At three degrees of separation, it is connected to 93% of actors, which is the maximum proportion that it can connect to. This characteristic is similar to UNEP and IUCN, both of which can connect to a maximum of 91% of actors at three degrees of separation. Despite the ASEAN's high outward degree centrality and the wide range of functions of actors that it is linked with, it reaches only 67% of all actors in the population at two degrees of separation. This indicates that it is not the number of direct outward ties that determines an actor's reach, but rather the reach or "sphere of influence" of the actors that it is connected to. In this sense, GEF is able to maximize its reach by strategically implementing its projects through well-positioned regional actors.

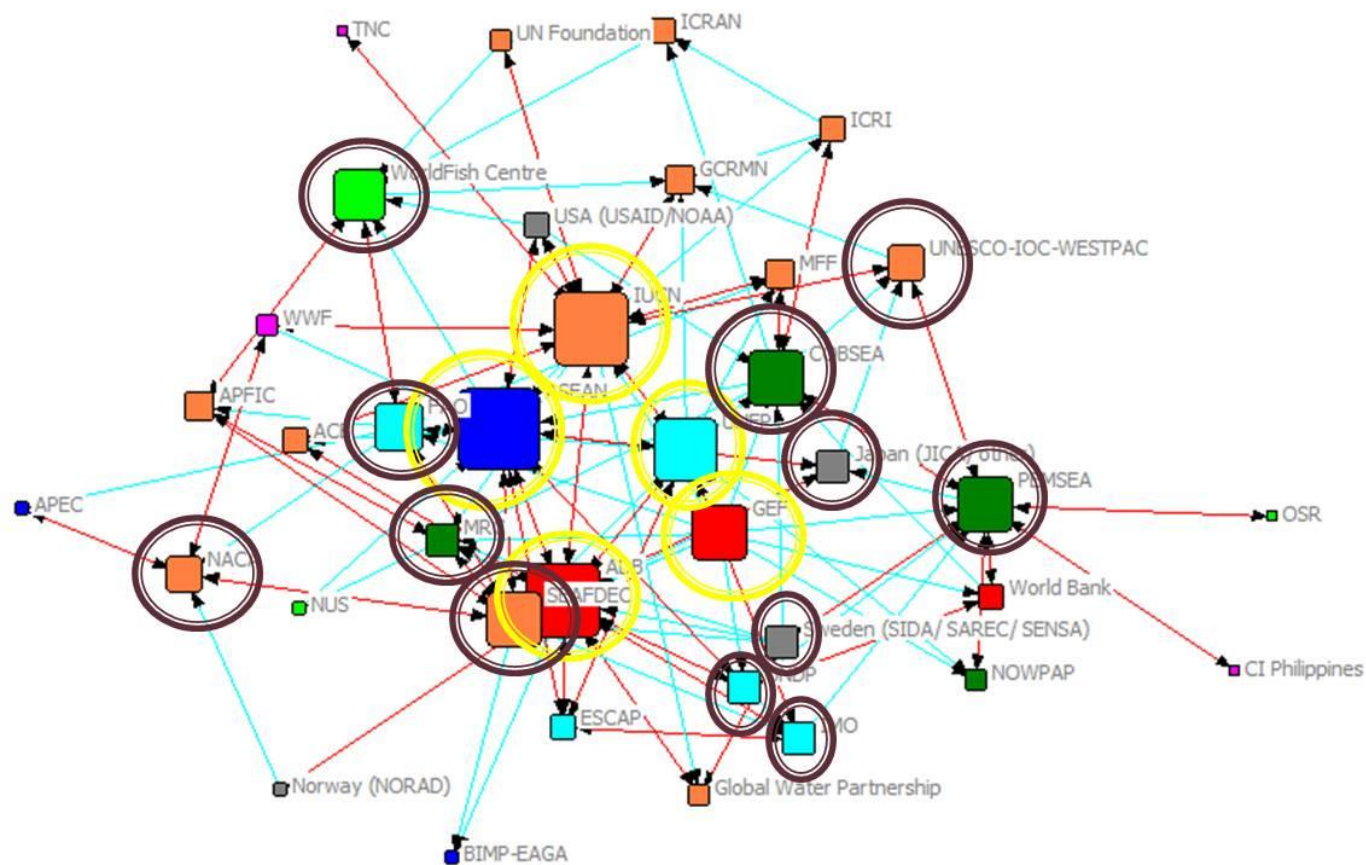


Figure 5. GEF's network at 2° separation. Yellow circles indicate top 5 actors with highest outward degree centrality; brown circles include top 15 actors with high degree centrality (aqua lines - non-reciprocal ties, red lines - reciprocal ties)

A negative analysis examining changes in the network structure in the absence of GEF, PEMSEA and any ties between other actors resulting from GEF initiatives showed that most of the ties exist even in the absence of GEF. This reflects how historically, GEF implementing agencies have well-established roles in the region, and have been functioning decades before GEF entered the region. What GEF may have

introduced is incremental funding to allow implementing agencies to move beyond coordination and planning towards the implementation of environmental initiatives on the ground.

A separate analysis of regional donor funding shows, for example, that UNEP provides no funds for either regional or national environmental initiatives, but rather acts as a “financing agency”, as opposed to being a donor. In the absence of GEF, UNDP’s only regional engagement documented by the literature sources is with ASEAN. The analysis of donor funding further reveals that UNDP has no funding for regional-level projects, but rather provides small grants at the country level.

GEF as a multilateral funder is functionally most similar to the development banks. What distinguishes it from the banks is its focus on global environmental concerns, which translates into larger investments for regional (as opposed to national) programs. The country-based nature of most interventions of development banks is most likely the reason that the World Bank does not appear as a relevant regional actor in this analysis. Also, GEF’s mode of funding is through grants rather than loans.

ANNEX

Analysis of GEF cofinancers

An analysis of GEF's portfolio of 41 IW-related projects that are fully or partially within the South China Sea and adjacent seas shows that ties between GEF and several other regional actors exist, but are not captured by the literature reviewed. These actors have contributed to GEF initiatives mostly in the form of cofinancing planned at project inception, and some through the funding of specific project activities in an opportunistic manner (see Table 5). Non-financial relationships with other actors at project and activity level were not examined.

Table 5. Bilateral donors and regional organizations with ties to GEF not captured by literature sources

GEF PARTNER*	NO. OF GEF PROJECTS	GEF PARTNER*	NO. OF GEF PROJECTS
Japan	5	CI-PH	1
Denmark (DANIDA / DANCED)	4	France	1
USA (NOAA)	4	Norway	1
WWF	4	Spain	1
Australia	3	TNC	1
European Commission	3	WorldFish Centre	1
UNESCO	3		
Sweden (SIDA)	3		
Canada	2		
Finland	2		
Germany	2		

*These do not include actors that: 1) already have recorded ties with GEF, 2) are already indirectly connected to GEF exclusively through recorded ties with PEMSEA, or 3) have cofinanced only one GEF project and are not part of the network analysis.

Japan cofinances the greatest number of GEF projects, all of which are regional in nature. All projects cofinanced by the European Commission are global projects. The great majority of projects cofinanced by bilateral donors are IW regional projects, followed by IW global projects. Only biodiversity projects in the Philippines and Vietnam are cofinanced by bilateral donors, with two by Denmark in Vietnam, and one each by Germany and USA in the Philippines.

Of the international NGOs included in the network analysis, WWF cofinances the greatest number of GEF projects, and is the only one that has cofinanced country-level projects. All cofinancer NGOs collaborate on regional-scale projects.

Looking at sectors of actors (apart from participating national governments), 13 projects are co-financed by local governments in the beneficiary countries and 12 by the private sector, with only 4 projects cofinanced by both sectors. Less than 5 projects each are cofinanced by community organizations, local academic institutions, and local NGOs.

Half of the projects have an average of 1 to 2 cofinancers, excluding participating countries. The projects with the highest number of cofinancers are two regional programs that are part of the PEMSEA cluster, and two (regional and global learning) under the Coral Triangle Initiative.

Table 6. List of actors included in analysis and their acronyms

ADB	Asian Development Bank
APEC	Asia-Pacific Economic Cooperation
APFIC	Asia-Pacific Fisheries Commission
ARCBC	ASEAN Regional Centre for Biodiversity Conservation (now ASEAN Centre for Biodiversity or ACB)
ASEAN	Association of Southeast Asian Nations
Australia (AUSAID)	(Australian Agency for International Development)
BIMP-EAGA	Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area
Canada (CIDA/ IDRC)	(Canadian International Development Agency/ International Development Research Centre)
CI-PH	Conservation International - Philippines
COBSEA	Coordinating Body for the Seas of East Asia
Denmark (DANIDA)	Danish International Development Agency
EARL/ OSRL	East Asia Response Ltd/ Oil Spill Response Ltd
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)
EU	European Union
FAO	Food and Agriculture Organization (UN)
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
Global Water Partnership	--
ICRAN	International Coral Reef Action Network
ICRI	International Coral Reef Initiative
IGBP	International Geosphere-Biosphere Program
IMO	International Maritime Organisation (UN)
IUCN/ WCPA	International Union for Conservation of Nature
Japan (JICA/ other)	(Japan International Cooperation Agency)
MacArthur Foundation	--
MFF	Mangroves for the Future
MRC	Mekong River Commission
NACA	Network of Aquaculture Centres in Asia-Pacific
Norway (NORAD)	Norwegian Agency for Development Cooperation
NOWPAP RCU	Northwest Pacific Action Plan Regional Coordinating Unit
NUS	National University of Singapore
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia

SEA START RC	Southeast Asia Global Change System for Analysis Research and Training Regional Centre
SEAFDEC	Southeast Asian Fisheries Development Center
SEAPOL	South-East Asian Programme in Ocean Law, Policy and Management
Sweden (SIDA/ SAREC/ SENSAs)	(Swedish International Development Agency/ Swedish Agency for Research Cooperation with Developing Countries/ Swedish Environmental Secretariat in Asia
TNC	The Nature Conservancy
UN Foundation	United Nations Foundation (UN)
UNDP	United Nations Development Programme (UN)
UNEP	United Nations Environment Programme (UN)
UNESCO-IOC-WESTPAC	United Nations Educational, Scientific and Cultural Organization - Inter-Oceanographic Commission - West Pacific (UN)
USA (USAID/NOAA)	(United States Agency for International Development/ National Oceanic and Atmospheric Administration)
Wetlands International	--
World Bank	--
WorldFish Centre	--
WWF	Worldwide Fund for Nature

Table 7. Criteria used for assigning actor roles

PROVIDER	high + % net giving, low reciprocity
RECEIVER	high - % net giving, low reciprocity
FACILITATOR	low % net giving (-0.25 to 0.5), low reciprocity
COLLABORATOR	low % net giving (-0.5 to -0.26), high reciprocity

- % net giving is calculated by subtracting the number of inward ties from the number of outward ties, then dividing this by the number of undirected ties
- reciprocity is the proportion of an actor's ties that are reciprocal out of its total number of undirected ties

Table 8. Degree centrality of actors in the analysis and their primary function

	PRIMARY ACTOR FUNCTION	Degree Centrality
ADB	Multi-lateral funding	15
APEC	Economic cooperation	2
APFIC	Sector/theme coordination	5
ACB	Sector/theme coordination	4
ASEAN	Economic cooperation ⁵	14
Australia (AUSAID)	Bilateral funding	3
BIMP-EAGA	Economic cooperation	2
Canada (CIDA/ IDRC)	Bilateral funding	3
CI Philippines	International NGO*	1
COBSEA	Regional ecosystem management	11
Denmark (DANIDA)	Bilateral funding	1
OSR	Technical service provider	1
ESCAP	UN Agency*	4
EU	Bilateral funding	5
FAO	UN Agency*	7
GCRMN	Sector/theme coordination	5
GEF	Multi-lateral funding	11
Global Water Partnership	Sector/theme coordination	3
ICRAN	Sector/theme coordination	4
ICRI	Sector/theme coordination	4
IGBP	Sector/theme coordination	1
IMO	UN Agency*	6
IUCN	Sector/theme coordination	14

⁵ Although the ASEAN is an important means for the Southeast Asian nations to agree on trade relations with other countries, it is also increasingly serving as a credible forum for dialogue and conflict resolution.

Japan (JICA/ other)	Bilateral funding	6
MacArthur Foundation	International NGO*	0
MFF	Sector/theme coordination	5
MRC	Regional ecosystem management	6
NACA	Sector/theme coordination	7
Norway (NORAD)	Bilateral funding	2
NOWPAP	Regional ecosystem management	3
NUS	Technical service provider	2
PEMSEA	Regional ecosystem management	11
SEA START RC	Sector/theme coordination	2
SEAFDEC	Sector/theme coordination	11
SEAPOL	Sector/theme coordination	2
Sweden (SIDA/ SAREC/ SENS)	Bilateral funding	6
TNC	International NGO	1
UN Foundation	Sector/theme coordination	3
UNDP	UN Agency*	6
UNEP	UN Agency*	11
UNESCO-IOC-WESTPAC	Sector/theme coordination	6
USA (USAID/NOAA)	Bilateral funding	4
Wetlands International	International NGO*	2
World Bank	Multi-lateral funding	4
WorldFish Centre	Technical service provider	10
WWF	International NGO*	2

* These categories are more descriptive of the type of organization rather than their function. Although these organizations tend to be technical service providers, classifying them based on their nature gives a better idea of the wider range of functions that they provide to the region, as well as distinguishes them from other technical service providers that have a narrower regional function.

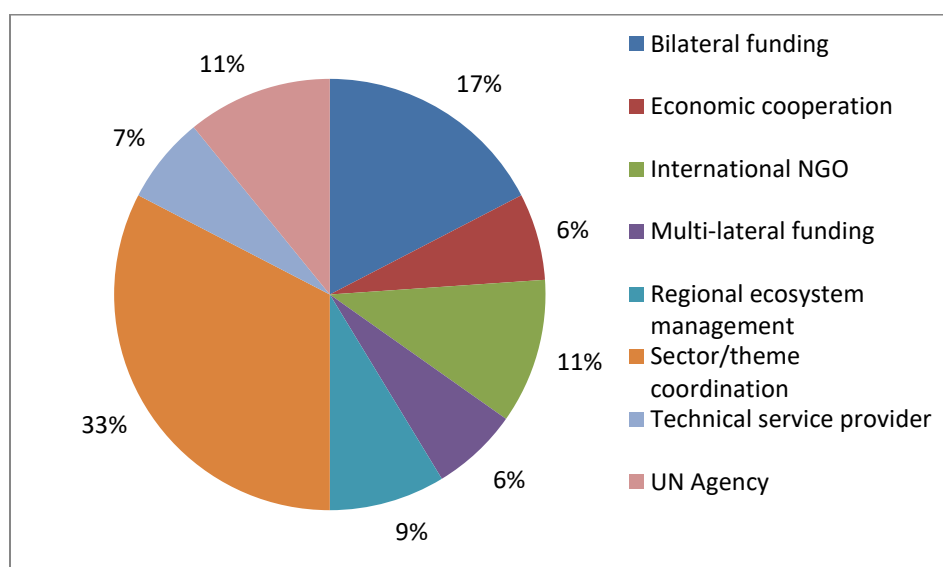


Figure 6. Relative proportions of actor functions in network

Table 9. List of sources for deriving population of actors for analysis, by chronology

		SCOPE	METHODOLOGY	REMARKS
UNDP-GEF	1993	Organizations and programmes involved in marine pollution management in East Asia	Unknown	--
UNEP	1997	Regional cooperation and environmental initiatives in Asia and the Pacific	Unknown	Only sections relating to biodiversity, freshwater resources, education and information, climate change, and coastal & marine resources were included in the network analysis
Rijsberman	1998	Cooperative activities in coastal zone management in Asia	Workshop documents, discussion at Expert Group Meeting on Regional Cooperation in Management of Coastal Zones and Non-Living Marine resources Development in Asia and the Pacific (Bangkok, 1997), author experience	--
Kato & Takahashi	2001	Sub-regional environmental governance systems	Unknown (IGES framework)	Focus on chapter and conclusions on Southeast Asia; Northeast Asia and South Asia chapters not included in network analysis
ADB	2002	Mechanisms for cooperation in Southeast Asia	Unknown	--
Tan	2003	Coastal and ocean governance institutions and organizations with coastal and marine management mandate	Archival and internet research, emails to secretariats, discussion at Experts' Meeting on Coastal and Ocean Governance (KL, 2002)	East Asian Seas region; PEMSEA excluded by author
UNEP	2005	Intergovernmental actors and sources of resources for water governance in South China Sea	Unknown	--

COBSEA	2005	Actors and programs involved in coastal pollution and habitat management	Unknown	--
MFF Secretariat	2009	Principal regional institutions responsible for ICM	Archival and internet research, written questionnaires, personal interviews with representatives of surveyed institutions (except IOC), discussion at 3 rd East Asian Seas Congress (Manila, 2009)	Discussion on South Asian actors not included in network analysis; NOWPAP excluded by authors because member countries not part of MFF
Tengberg & Cabanban	2010	Mechanisms with coordinating roles in East Asian Seas based on mandate	Unknown	--

ADB. 2002. Appendix 4: Subregional cooperation mechanisms. In *Southeast Asia subregional report for the World Summit on Sustainable Development*, pp. 71-76. Asian Development Bank, http://www.adb.org/Documents/Reports/SEA_WSSD/appdx_04.pdf.

COBSEA. 2005. COBSEA East Asian Seas Knowledgebase. Coordinating Body for the Seas of East Asia, http://137.132.140.188/cobsea/Search_Query.php?theme=all&Send=GO&t=tbl_activities.

Kato, K. and W. Takahashi. 2001. *Regional/ subregional environmental cooperation in Asia*. Institute for Global Environmental Strategies, 133 pp.

MFF Secretariat. 2009. *Rapid assessment of the opportunities for a sustainable regional mechanism for governmental and civil society collaboration on integrated coastal management in the Indian Ocean region, South Asian seas, and South East Asian seas*. Mangroves for the Future Initiative, 64 pp.

Rijsberman, F. R. 1998. Review of the status of subregional and regional cooperation in coastal zone management and marine environment and non-living marine resources development. In *Emerging policy initiatives and activities in coastal zone management and non-living resource assessment in Asia and the Pacific: Development and management of non-living resources in the coastal zones of the Asia-Pacific region series*, Vol. 3, pp. 103-106. United Nations.

Tan, A. 2003 (unpublished). *Review of regional mechanisms for coastal and ocean governance in the seas of East Asia*. Partnerships for the Environmental Management of the Seas of East Asia, 65 pp.

Tengberg, A. and A. S. Cabanban. 2010 (unpublished). *Background paper for the East Asian Seas Stocktaking Meeting: Preparation of a programmatic approach for the coordinated sound management and development of the East Asia Seas Region*. Global Environment Facility, 54 pp.

UNDP-GEF. 1993. Annex 11: Coordination with on-going international and bilateral programmes/ projects related to the prevention and management of marine pollution in the East Asian Seas Region. In *Prevention and Management of Marine Pollution in East Asian Seas, Programme Document*. United Nations Development Programme, 47 pp.

UNEP. 1997. Chapter 3: Policy responses and directions. In *Global environmental outlook-1: global state of the environment report*. United Nations Environment Programme, http://www.unep.org/geo/geo1/ch/ch3_13.htm.

UNEP. 2005. Wilkinson, C., DeVantier, L., Talaue-McManus, L., Lawrence, D. and D. Souter. Annex III: List of important water-related programmes and assessments. In *South China Sea, GIWA Regional Assessment 54*, pp. 70-76. University of Kalmar: Kalmar, Sweden.