Using *Enhancing our Heritage Toolkit* for assessing management effectiveness of the Kien Giang Biosphere Reserve

Chu Van Cuong

School of Earth and Environmental Science, The University of Queensland, Australia and Tam Dao National Park, Vietnam.

Email: v.chu1@uq.edu.au

Peter Dart, PhD

School of Agriculture and Food Sciences, The University of Queensland, Australia.

Marc Hockings, PhD

School of Earth and Environmental Sciences, The University of Queensland, Australia and UNEP World Conservation Monitoring Centre, Cambridge, UK.

ABSTRACT: Biosphere reserves operating under the UNESCO Man and the Biosphere Programme aim to achieve three mandate management objectives of conservation, sustainable socio-economic development, and logistic support. The apparent mismatch between the biosphere reserve (BR) concept and implementation reality has led to the call for assessment of management effectiveness as part of a system to support management of sites under the Seville Statutory Framework for the Biosphere Reserves Network since 1995. We used the Enhancing our Heritage Toolkit developed by the International Union for Conservation of Nature (IUCN) and UNESCO to evaluate the management effectiveness of the Kien Giang Biosphere Reserve (KGBR). A lack of broad understanding for the conceptual model leads to the biosphere reserve concept being essentially an artificially constructed model with little buy-in from agencies of government and limited efforts to pursue an adequate planning and implementation process. The management system established in KGBR lacks operational funding and its staff lacks adequate knowledge of the BR model, but exhibit strong sectoral commitments that cut across the BR approach. Consequently, most of the important values found in the KGBR are ineffectively protected and managed. The case study in Kien Giang suggests that this management effectiveness evaluation tool can be used to assess performance and management outcomes of sites and assist stakeholders in adaptive planning and improving BR performance and effectiveness.

Keywords: Biosphere reserve, management effectiveness, evaluation, Enhancing our Heritage, Kien Giang

Introduction

The global network of Biosphere Reserves formalised under the UNESCO Man and the Biosphere Programme (MAB) from the 1970s aims to provide mechanism for balancing the needs for nature conservation and human development (UNESCO, 1996a; Ishwaran et al., 2008; Ishwaran, 2012). With introduction of the Seville Strategy in 1995, the BR concept has evolved from a primarily conservation and research focus to paying greater attention to sustainable development for the local communities (UNESCO, 1996a). Especially, since the adoption of the Seville Statutory Framework (UNESCO, 1996b), only proposed sites which comply with the requirement for clearly defined core, buffer and transition zones with a focus on fulfilling three core functions (conservation, sustainable development and logistic support) have been designated as BRs. The recent Lima Action Plan sets up strategic directions and actions for continually implementing the Seville Strategy and Statutory Framework for WBNR to 2025 (UNESCO, 2016a). There are currently 669 sites in the global network indicating that BRs are regarded as important potential models for conservation and sustainable development (Ishwaran et al., 2008;

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UNESCO, 2016b). However, the recent studies (e.g., UNESCO, 2010; Ishwaran, 2012; Coetzer et al., 2013; Reed, 2016; Cuong et al., 2017b) revealed a significant concern relating to an apparent mismatch between the BR concept and practical implementation. Thus, evaluation is recognised as a crucial process to assess management progress and improve BR success and effectiveness (Stoll-Kleemann, 2005, 2010; UNESCO, 2010; Coetzer et al., 2013; Matar & Anthony, 2017).

Systems for assessing the effectiveness of management provided a vital tool for assessing how well sites were being managed and to provide an informed base for adaptive management (Hockings, 2003; Cook et al., 2014). Management effectiveness evaluation (PAME) began to be applied to protected areas in the mid to late 1990s (Hockings et al., 2000; Hockings, 2003) and it has now become an important tool to monitor management systems, provide for adaptive management, and assess conservation outcomes (see e.g., Cook et al., 2014; Coad et al., 2015). Because the BR concept has originally evolved from PA approach (every BR must have one or more PAs as the core area in designation) (Ishwaran, 2010), it is a necessary to undertake progress assessment to ensure that all designated sites under the WNBR are being managed in compliance with the concept model and international criteria for BRs (Price, 2002; Price et al., 2010; Reed & Egunyu, 2013). Thus, the Statutory Framework for WNBR approved by the UNESCO conference in 1995 (UNESCO, 1996b), calls for assessment of management effectiveness as part of a system to enhance management of sites within the world network through a system of periodic reporting. The primary aim of such periodic review is to assess achievements of site management relating to the three core functions of BRs and explore learning opportunities at both national and international scales (Price, 2002; Price et al., 2010). Evaluation can also provide information from site management that can inform planning and decision-making processes and generate lessons learned at national and global levels (Bertzky & Stoll-Kleemann, 2009; Price et al., 2010; UNESCO, 2010; Reed & Egunyu, 2013).
However, periodic reports often lack indicators that support evaluating BR performance and management effectiveness because they mainly focus on assessment of the zonal compliance of sites under the Article 4 of the Seville Statutory Framework (Price, 2002; Lotze-Campen et al., 2008; UNESCO, 2010; Matar & Anthony, 2017).

In this article, we used the Enhancing our Heritage (EoH) Toolkit developed by IUCN and UNESCO for assessing management effectiveness of natural World Heritage Sites (Hockings et al., 2008) to (1) evaluate the performance and management effectiveness of the KGBR, (2) test PAME methods in BRs and examining how systemic BRs issues identified in the literature play out at the site level, and (3) recommendations on using management evaluation to improve BR performance and effectiveness.

Method

Study area

The study site was KGBR and located in the Mekong Delta. Its coordinates are 9^0 24'0.75"and $10^0$31'45.54" North latitudes, and 103^0 44'23.64" and 105^0 19'48.28" East longitudes. KGBR was created in 2006 and under direct management of the Kien Giang Provincial People Committee (PPC). Designation of the BR was based on the expansion of three existing core areas (U Minh Thuong NP, Phu Quoc NP and Phu Quoc Marine PA, and Hon Chong-Kien Luong PA) and their mandated buffer zones to the wider landscape that encompasses over 200 km of provincial coastline, marine, islands, and nearby mainland. The total area of the KGBR is 1 118 105 ha and includes 3 zones; core zone (36 935 ha), buffer zone (172 578 ha) and transition area (978 592 ha).

Management effectiveness evaluation

The framework for evaluating management effectiveness originally developed by the International Union for Conservation of Nature (IUCN) World Commission on Protected Areas includes six key elements for evaluation of the complete management cycle: context, planning, inputs, processes, outputs, and outcomes (Hockings et al., 2004). Ninety-five methodologies have been developed and applied in evaluation for both global PA systems and approximately 18 000 individual

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sites (Coad et al., 2015). One of the most detailed evaluation methods, UNESCO's Enhancing our Heritage (EoH) Toolkit, was designed for assessing effectiveness at the site level (Hockings et al., 2008; Hockings et al., 2009). EoH was developed by UNESCO and IUCN in 2001 and piloted in nine natural World Heritage sites in Africa, South Asia, and Latin America (Hockings et al., 2008), and has subsequently been applied in a number of other natural World Heritage sites around the world (Coad et al., 2015). The EoH Toolkit consists of twelve assessment tools that uses quantitative and qualitative data to understand key site values and threats as well as develop a rich understanding of management strengths and weaknesses. It was designed to directly aid site managers in improving their management strategies and practices (Hockings et al., 2008; Hockings et al., 2009; Stoll-Kleemann, 2010).

Data collection and analysis

EoH guidelines and worksheets were downloaded online from website http://whc.unesco.org/en/eoh and translated into Vietnamese prior to the field visit in Kien Giang. The information used for management effectiveness evaluation of the KGBR was compiled from document analysis, meetings with 5 key members of the Kien Giang Biosphere Reserve Management Board (BRMB) and a final participatory workshop with managers and stakeholders.

The management effectiveness evaluation process started with initial meeting between the principal researcher and key members of the BRMB in January 2014. EoH toolkits were briefly introduced and handed over to key managers of BRMB during the meetings. At this stage, all publications, official reports, and data from research and monitoring studies relating to KGBR were collected. The management effectiveness evaluation and EoH toolkits were officially presented at the KGBR workshop in February, 2014. The summary of EoH and evaluation tools was also included in the monitoring and evaluation section of the Action Plan for KGBR (Cuong et al., 2014).

The reports and documents collected in Kien Giang were reviewed by the principal researcher and KGBR Operating Office staff and relevant evidence was transferred to the worksheets. A provisional assessment based on this evidence was then developed by this group. In April 2016, the principal researcher organized five meetings with the key people from BRMB including vice standing director, chief officer of the BRMB, vice director of U Minh Thuong (NP) and Phu Quoc Marine PA and director of Hon-Dat Kien Ha Forest Protection Management Board. Each meeting lasted approximately three hours where the preliminary assessment was discussed, additional evidence was added to the worksheets in advance of the final workshop.

Twenty people, including two representatives from local community in Hon Dat who had good knowledge and experience related to the management of the KGBR and who had already been involved in previous discussions and the management effectiveness evaluation training workshop participated in one-day participatory workshop in Rach Gia. Participants used the initial worksheets and information to discuss, change or validate, and add additional information to complete the evaluation facilitated by the principal researcher. Information collected from the meetings, field observations and participatory workshops was synthesized and analyzed using the six elements of the management cycle as outlined in the IUCN-WCPA framework.

Results

Six elements of the IUCN-WCPA framework were summarized in the Table 1. The study revealed a low overall performance and management effectiveness in KGBR. Although the BR values, threats, and management objectives were identified and agreed by stakeholders, the practical planning and management of the KGBR was hindered by the lack of legal status, low priority in the provincial management framework, and lack of stakeholder engagement with the BR approach. The designation of site theoretically followed the landscape approach, but exhibited weak integration and connectivity due to the

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the predominance of sectoral planning and management being confined to administrative boundaries. There were inadequate efforts and commitment to complete the BR planning process.

Consequently, no official work plan exists which, coupled with inadequate capacity staff and operational resources, meant that management was hindered. This in turn, limited the achievement of desired outcomes and reduced overall management effectiveness.

Table 1. Summary of management effectiveness assessment results

IUCN-WCPA element	EoH tools	Key issues	Data sources	Required follow up actions
Context	Tool 1: Biosphere reserve values	• Incomplete biological and social survey • Non-existence of the systematic information at the BR level • Most information is not up to date • Unshared information between institutions, departments and agencies	Kien Giang PPC, 2005; Dang, 2009; Cuong & Dart, 2011; Carter, 2013; Hai, 2013	• Set up a system to compile and update information • Set up mechanism for information sharing and exchange across the BR stakeholders • Conduct new studies to collect information gaps • Update management objectives
	Tool 2: Threats to the BR	• KGBR is facing 11 key threats deriving from human activities and climate change	Dang, 2009; ADB, 2011; Carter, 2013; Cuong et al., 2014; Mateo & Garforth, 2014	• Set up clear indicators to monitor the change of threats and conditions
	Tool 3: Stakeholder relationship and engagement	• Lack of understanding and engagement in BR approach from provincial stakeholders, communities and industry	Cuong & Dart, 2011; Cuong et al., 2014	• Improve stakeholder awareness and understanding about the role and benefit from having BR • Engage local people and industry in BR planning and management
	Tool 4: National and provincial management context	• BR has weak national legal position • There was a weak integration BR approach in the provincial socio-economic and sectoral plans	Cuong et al., 2017a; Evaluation workshop	• Improve legal position and creditability of the BR through integration into the provincial socio-economic and sectoral planning processes and management plans
	Tool 5: Management planning	• Incomplete planning process	UNESCO Hanoi, 2013;	• Revise BR Action Plan and obtain PPC approval

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IUCN-WCPA element	EoH tools	Key issues	Data sources	Required follow up actions
Plan		• Low priority BR planning and management	Evaluation workshop	• Develop annual plan and funding based on the approved Action Plan
	Tool 6: BR designation and planning	• Small core areas • Low integration and connectivity among 3 zones due to predominance of sectoral planning and administrative boundary management	Carter, 2013; Evaluation workshop	• Improve stakeholder participation and collaboration in BR planning. • Improve knowledge of ecosystem approach for managers and staff, and encourage them to apply in practice
Inputs	Tool 7: Management needs and inputs	• Very limited contribution (time and effort) from BRMB • Lack of staff capacity • No BR operational fund	Annual reports (Kien Giang BRMB, 2012, 2013, 2014, 2015, 2016)	• Improve management capacity for BRMB and staff • PPC allocates operational funding for BR • Sectors assign staff working with BR office
Process	Tool 8: Management process	• Inadequate capacity to manage the system and reporting process	Annual reports (Kien Giang BRMB, 2012, 2013, 2014, 2015, 2016); Evaluation workshop	• Develop annual work plan • Set up monitoring and evaluation system • Improve reporting system and use for adaptive planning and management • Improve management capacity and communication.
Outputs	Tool 9: Assessment of management outputs	• Low management progressing • Ineffective managing and conserving BR values	Annual reports (Kien Giang BRMB, 2012, 2013, 2014, 2015, 2016); Evaluation workshop	• Improve management capacity to improve delivery services. • Improve law enforcement • Develop standard indicators to measure management outputs
	Tool 10: Site output indicators	• No standard indicators set up to measure management outputs		
Out-comes	Tool 11: Assessing the outcomes of management	• No monitoring and evaluation (M&E) tool for assessing the management outcomes • Most of key ecosystems are deteriorating or in a degraded condition	Dang, 2009; Long et al., 2011; Johnstone, 2013; Van & Lam, 2013	• Increase investment in ecosystem research and restoration • Set up new PAs to increase level of ecosystem protection • Develop and implement regular M&E at PA and BR.

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Context

Biosphere reserve values. KGBR has a rich and significant biodiversity, many historical heritage sites, and cultural values and events (Kien Giang PPC, 2005; Dang, 2009; Carter, 2013; Vietnam Sustainable Tourism Institute, 2013). However, most of the information relating to biological values, socio-economic conditions, and human population in the KGBR has not been systematically updated since 2005 when the KGBR was designated. Some more recent information exists, but it is often kept by different departments and agencies and used internally. The biological information of the BR is mainly available at site level of the NPs and where the research efforts have been focused. Recent efforts to compile biodiversity information at the BR level were only for vascular plants, terrestrial vertebrates (mammals, birds, reptiles and amphibians), coral reefs, and sea grass. There is some data on threatened species but with Table 2. Key threats to KGBR very little detail on their population sizes and ecological processes due to the lack of a monitoring and evaluation program (Appendix 1).

Threats. The study identified 11 key threats affecting to KGBR management objectives (Table 2). Ten out of eleven threats were identified at site level of NPs and PAs while eight threats were found in buffer zone and transition area. Most identified threats in KGBR come from economic and development activities. Habitat loss and degradation due to economic and infrastructure development, forest fire, and climate change were the three most significant threats to the biological values of the KGBR. Although illegal hunting and wildlife trading was a low threat, it is occurring across the BR (Appendix 2). Many species including endangered species such as dugongs, sea turtles, sea horses, pangolin, and reptiles are subject to illegal hunting and trading (e.g., Stuart, 2004; Giles et al., 2005; Hamman et al., 2006; Hines et al., 2008; Dang, 2009; Nuwer & Bell, 2014)

Threats	Existing Core areas				PAs in planning			Buffer zone and transition area	Rating level of threat*
	U Minh Thuong NP	Phu Quoc NP	Phu Quoc MPA	Kien Luong PA	Phu My Grass-land	Lime-stone out crops	Dong Ho lagoon		
Habitat loss and degradation	x	x	x	x	x	x	x	x	High
Forest fire	x	x		x				x	High
Climate change	x	x	x	x	x		x	x	High
Limestone quarrying						x			Medium
Coastal erosion								x	Medium
Inappropriate and over fishing			x				x	x	Medium
Pollution		x	x				x	x	Medium
Heritage degradation	x	x		x				x	Low
Illegal poaching and wildlife trading	x	x	x	x		x		x	Low
Illegal land encroachment		x			x		x		Low
Invasive species	x	x					x		Low

* Low: 10 percent or less of the value is threatened; Medium: 11-25 percent of the value is threatened; High 26 – 75 percent of the value is threatened; Very high: 76-100 percent of the value is threatened.

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Stakeholders and their engagement. Nine key groups of stakeholders directly involved in planning and management of the KGBR were identified (Table 3). Using rating system with 4 levels (very good, good, fair, and poor), we found that the stakeholder engagement in Kien Giang was generally weak (Appendix 3).

Table 3. Stakeholder engagement in KGBR

Stakeholders	Stakeholder engagement in biosphere reserve values				Overall rating *
	Biodiversity and natural values	Heritage and cultural values	Economic development	Environmental education and research	
Province People Committee	Fair	Fair	Good	Fair	Fair
District and Commune People's Committees	Fair	Fair	Good	Poor	Fair
Kien Giang BRMB	Fair	Fair	Fair	Fair	Fair
Provincial departments	Fair	Fair	Fair	Fair	Fair
NPs, PAs and FPMB	Good	Fair	Fair	Fair	Fair
Enterprises	Poor	Fair	Fair	Poor	Poor
Local People	Poor	Poor	Fair	Poor	Poor
Socio-political organisations	Fair	Poor	Fair	Poor	Poor
Projects, NGOs	Good	Fair	Fair	Good	Fair
Education and research institutes	Fair	Fair	Fair	Fair	Fair

* Poor: 25 percent or less of the aspects of the relationship is positive; Fair: 26-50 percent of the aspects of the relationship is positive; Good: 51-74 percent of the aspects of the relationship is positive; Very good: More than 75 percent of the aspects of the relationship is positive.

Five group provincial stakeholders directly involved in BR management and their engagement was rated at "fair" level. Although the Management Regulation for KGBR requests all relevant stakeholders collaborate with BRMB to coordinate and facilitate BR activities through integrating sectoral plans and activities in the BR planning, the study revealed inadequate commitment of stakeholder to follow through in practice. The level of stakeholder cooperation in BR management varies depending on their understanding of the role of the BR approach and the engagement of the PPC Vice Chairman who is the chair of the Management Board (Cuong, pers. obs. since 2009).

Local people and socio-political organizations[2], and business enterprises were identified as the key natural resource users but their engagement in BR planning and management was poor.

The large population (*c.* 735 000 people) and local enterprises living in the buffer zone and transition area directly exploit and use natural resources (land, water, forest, and marine area) and ecosystem services in production and generating incomes activities. Although they are considered as key audiences needed for threats management and

[2] Women Association, Farmer Association, Youth Union, and Veteran Association

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maintenance of the KGBR values, the dominant practice of the top-down and state control approach devalues their role in BR planning and management.

External projects and NGOs provide technical and finance support to the provincial authorities and local communities in awareness raising, capacity building, biodiversity conservation, and livelihood development. Except for the conservation and development of the KGBR project (GIZ/DFAT project) that provided large scale technical support other development projects tended to focus on a limited area with specific intervention and thematic targets. There was no long-term engagement of these projects in BR planning and management.

Universities and research institutes undertake their research and studies using different funding sources in the NPs, PAs, and BR. Information and scientific evidence from studies assist in planning and decision making that improves natural resource management. However, the current communication and contact relating to research and scientific studies is often made between researchers and their organization with the NP, PAs, or other departments rather than with BRMB or BR office. Except for the studies using funding from the province, not many researchers/institutes return their reports and findings after finishing their studies. There was no formal agreement or partnership established between BRMB and research institutes and universities in supporting BR management.

National and provincial management context. The BR approach was initiated in Vietnam starting in 2000 to promote biodiversity conservation, sustainable development, and scientific research and environmental education. In contrast to the PA system, BRs have not yet legally recognised in the national laws and management framework in Vietnam. In addition, there was unclear management structure for the BR system at the central level that led to the governance structure and policy applied in BR management varies from province to province (Cuong et al., 2017a).

In Kien Giang, the BR is under the direct management of the Kien Giang PPC. The province sets up a BRMB to facilitate the BR approach through coordinating relevant sectoral activities under the umbrella of the five-year provincial socio-economic development plan (2016-2020) that established target of 14 percent economic growth rate and forest cover increase from 8.5 percent in 2015 to 14 percent by 2020 (Kien Giang PPC, 2015). In supporting this master socio-economic development plan, all departments and provincial agencies are implementing their sectoral and other related strategic plans in line to the central ministries. The study identified at least 26 official plans including socio-economic development for province and (10) districts, land use plan, and sectoral development that are relevant to BR operation and management (Appendix 4). However, all of these plans were developed and managed without any acknowledgements and linkages to the BR.

Designation and planning

KGBR is the second largest BR in Vietnam and its designation conforms to the Seville criteria. The BR delineates a core zone with legal management under the national laws and overlap with other international designations (e.g., Ramsar site and ASEAN Heritage Park in case of U Minh Thuong NP) and a buffer zone and transition area. Although the core areas play the main role in conserving the last remaining ecosystems, species, and ecological processes, these parks are too small for ecosystem integrity and isolated from each other in the large production area with high economic growth demands (Figure 1). Additionally, establishment of the buffer zone and transition area aims at creating a buffer protection area for the core zone and connecting fragmented NPs and PAs across the landscape. In fact, there was a weak integration and connectivity among the three zones of the BR that allows for application of the ecosystem approach.

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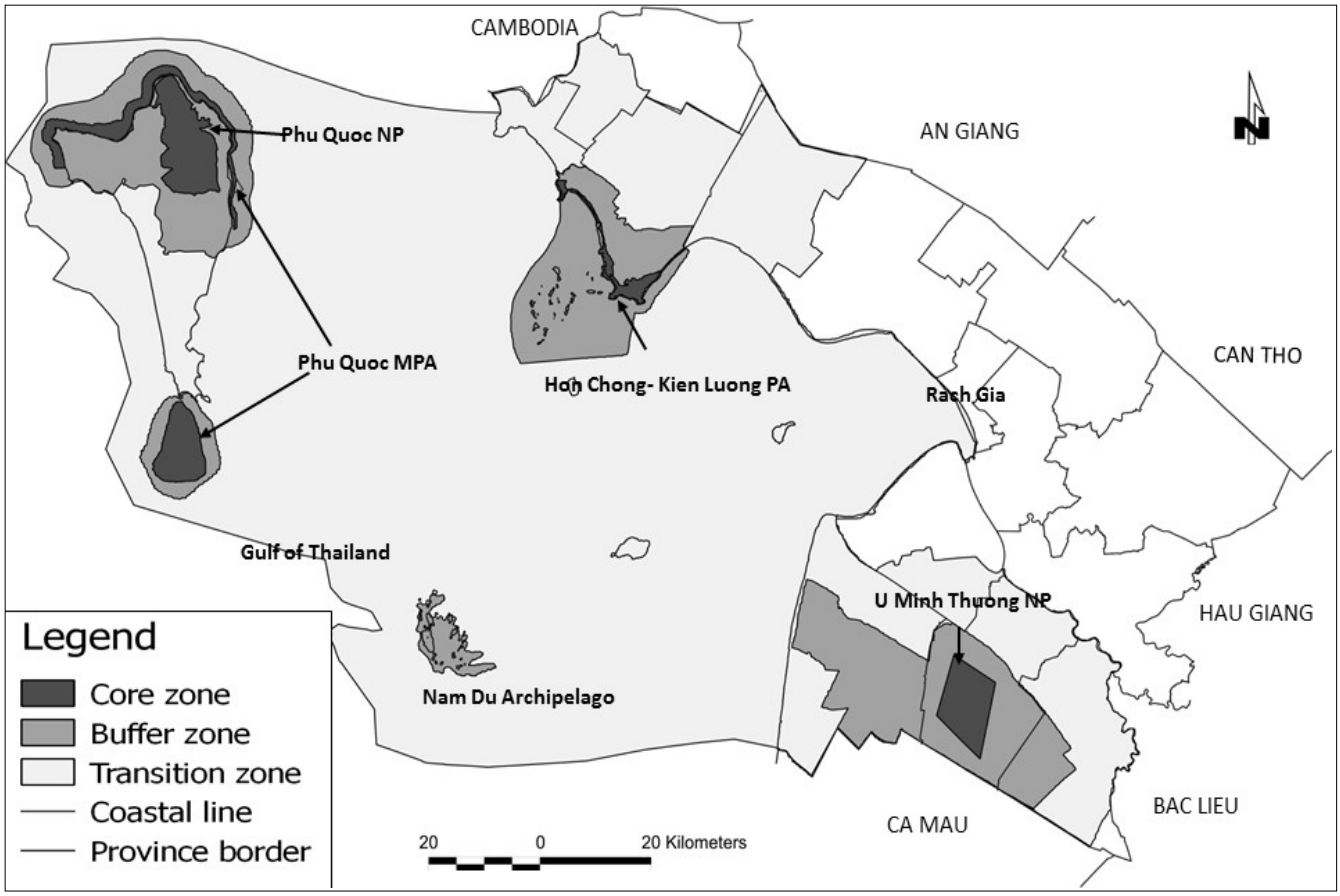

Figure 1. Designation of the KGBR

It appeared an incomplete planning process even though the Action Plan for KGBR has been developed since 2014. The Action Plan clearly identified values of the site, threats, and the set of nine action programs (Management policy, awareness and capacity building, improvement of cross-sectoral planning and collaboration, biodiversity conservation, livelihood improvement, scientific research, international cooperation, BR finance mechanism, and climate change adaption) that mainly based on the information and lessons learned from implementation of the GIZ/DFAT project. It also identified the need to develop and undertake a monitoring and evaluation system for whole KGBR and its core areas (Cuong et al., 2014). However, the Plan did not quantify human resources, operational funding, and specific funding sources required to deliver actions and achieve management objectives. Strikingly, the Plan has not yet become officially approved by PPC for implementation (Appendix 5).

Management inputs

The recent BR activities are coordinated by the BRMB that includes 29 members who only have good education background and skills relating to sectoral and administrative state management. The actual contribution from BRMB to BR operation and management is limited due to working for KGBR in part-time and unpaid roles.

The BR Operating Office nominally has six permanent positions, five of which are actually employed (Table 4), including one chief office (Information Technology), two technicians (one Forester and one Fishery staff), one administrator (English education background), and one accountant. Most of BR office staff have limited BR management capacity and working experience, particularly the communication, engagement, and fundraising skills. BR staff are not active and have little effort in communicating and building

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partnership with provincial departments and other stakeholders for funding and support (Kien Giang DARD manager, interviewed June 2014).

Table 4. Staff and funding for KGBR

No.	Items	Requirement	Actual
Human resources			
1	Number of permanent staff	6	5
Annual PPC funding for BR (Million VND)			
2	Management and administration	600	400
3	Biodiversity conservation	500	0
4	Livelihood development	600	0
5	Training, environmental education	200	0

There was no operational funding allocated from Kien Giang PPC for implementing BR activities even though it was repeatedly highlighted in all annual reports since 2011. Table 4 shows that the only two thirds of funding requirement (600 million VND or 28 000 USD) for BR administration (staff salary, payment for electricity, water and stationary of the office, and travel allowance for BRMB members when attending BR meetings) are allocated from provincial budget. Strikingly, no PPC and sectoral funding has been allocated for operating activities to improve BR functions. PPC, provincial departments, NPs, and PAs are struggling to find enough funding and resources to achieve their obligation tasks and targets, so it is unrealistic to ask for additional funding and staff support for BR activities (Kien Giang DARD senior planner, interviewed January 2014).

[2] Department of Science and Technology in charges in BR administration and scientific study in the BR, Department of Agriculture and Rural development in charges in forest, biodiversity conservation and livelihood improvement;

Management process

Twenty nine indicators were used to evaluate management process in KGBR. Apart from the site values, almost criteria belonging to four management themes of management structure and system, resource management, management and tourism, and management and communities) were rated as fair or poor (Appendix 6). This result showed a lack of capacity to manage the system in KGBR. Annual work plan criterion of the EoH was rated as poor because in contrast to most core areas (U Minh Thuong and Phu Quoc NPs, and Phu Quoc MPA), KGBR is currently operating without an annual plan. Similarly, there was no evaluation and monitoring system for the BR in place, even though some monitoring activities are being taken in the NPs and PAs mainly by projects and scientists.

Management structure and system. BRMB is chaired by a PPC vice chairman, but the actual BR administration and coordination falls in the Department of Science and Technology Director who will cooperate with other members, particularly three other vice chairs of the Board from key provincial departments and agencies[3] to undertake specific BR management topics that fit to their sectoral management responsibilities. The BRMB only organizes one or two meetings annually and often integrated as part of GIZ/DFAT project's planning workshops. The study revealed a weak management structure due to unstable leadership and weak commitment and accountability from departments and agencies. BR management is perceived to be shared responsibility by all BRMB members and their agencies, but it actually is nobody's business (Kien Giang DARD manager, interviewed June 2014).

The lack of a work plan, and absence of M&E data did not allow assessment of BR implementation. The BRMB has produced annual reports since 2012, but they only contain the minimal annual reporting requirements from PPC and national MAB Committee, and are not useful for constructive

Department of Culture, Sport and Tourism in charges in tourism promotion and development and BR branding, Kien Giang Union of Friendship Organization in charges in fundraising and external cooperation.

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assessment, and adaptive planning and management.

Indicators 10 to 12 (Appendix 6) are regarded as indicating low empowerment of staff in BR planning and management because they can only participate in discussions of some stages of planning process but not involved in final decision. Staff trainings and personnel management provision were also inadequate due to the irregular BR activities, unclear staff task assignment. Lack of regular maintenance plan and resources led to generally inadequate maintenance of equipment and basic infrastructures in the parks and BR.

Figure 2. Infrastructure and sign boards with inadequate maintenance

Resource Management. Indicators 15, 18, and 19 (Appendix 6) revealed an ineffective resource management in KGBR. Weak law enforcement coupled with lack of alternative livelihood options for the local people living in the buffer zone consequently led to illegal access to the protection areas for hunting, fishing, and exploiting resources. The study revealed little effort and investment in inventory of the marine resources. Information on the key critical habitats, ecosystems, and threatened species has not been updated to support effective planning and decision-making. Requirements for management of the key habitats, ecosystems, and threatened species are highlighted but there is a lack of human capacity and resources investing in conservation and restoration.

Management and tourism. Diversity of the natural landscapes, historical and cultural value, and local lifestyle associated the canal system attracts approximately 6 million visitors[4] to Kien Giang in

[3] Domestic, low-end tourists occur approximately 97 percent of the total visitors

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2015 (Kien Giang PPC, 2015; Kien Giang DOCST, 2016). However, the tourism potentials, especially the ecotourism and BR branding based products and services are under exploitation due to weak tourism management and inappropriate investment strategy (see indicators 20 to 23 in Appendix 6 for further information). Besides the recent inadequate visitor facilities and services, the imbalanced investment in tourism infrastructure development with roads and associated concrete tourism facilities poses high risk to biodiversity and natural values in Phu Quoc and Dong Ho lagoon (Cuong & Dart, 2011; Carter, 2013; Tran, 2013). In contrast, many historical sites associated with typical local lifestyle and cultures in the mainland have not received proper investment in exploitation for revenues and benefits (Carter, 2013). Additionally, there were few efforts to enhance visitor experience and site values through providing essential information in the visiting sites and the main contact between site managers and tourism operators is about the matters of access permission to the parks and entrance fees. There was a limited environmental education program to improve awareness for visitors and local people. The visitor management systems were only partially effective in controlling access to the parks in accordance to the laws and regulations.

Management and communities. Indicators 25 and 26 (Appendix 6) indicated that the local communities, including ethnic minority people have not yet involved in BR planning and management decisions. Additionally, the Action Plan for KGBR highlighted the needs to improve local people's awareness, livelihood essentials, and preservation of the local cultural values, but only a few activities were designed and undertaken. The study also revealed a limited effort and motivation from BR Operating Office to improve communication and establish a strong partnership with local communities and industry.

Management outputs

Active management of the site as a BR is limited. Although the Action Plan for KGBR proposed 40 activities for implementation in 2014 and 2015, only five percent were completely implemented with a further 30 percent in progress. 60 percent of the total planned activities were not started. Two activities (five percent) relating to BR international cooperation were cancelled because there was no further support from GIZ/DFAT project (Figure 3).

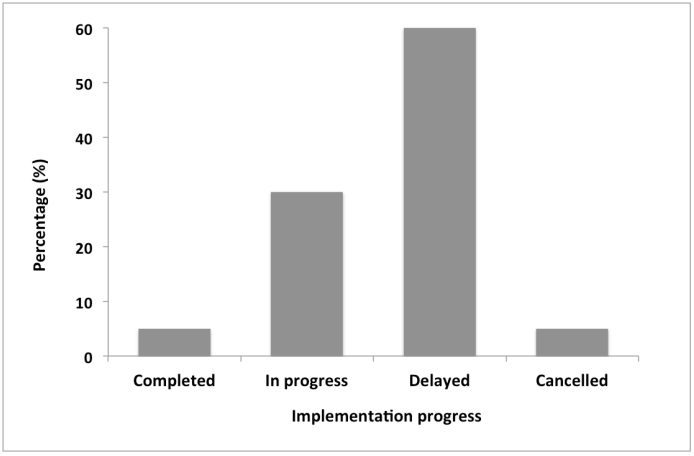

Figure 3. Management progress and outputs of the KGBR in 2014 and 2015

The most significant output under the nine areas in the Action Plan framework was management policy where the Management Regulation for the KGBR was prepared in 2014 (Figure 4). There was some progress in conservation and livelihood improvement but the activities under two these programs were undertaken by provincial departments and agencies. In contrast, scientific research, BR finance, and international cooperation revealed little progress.

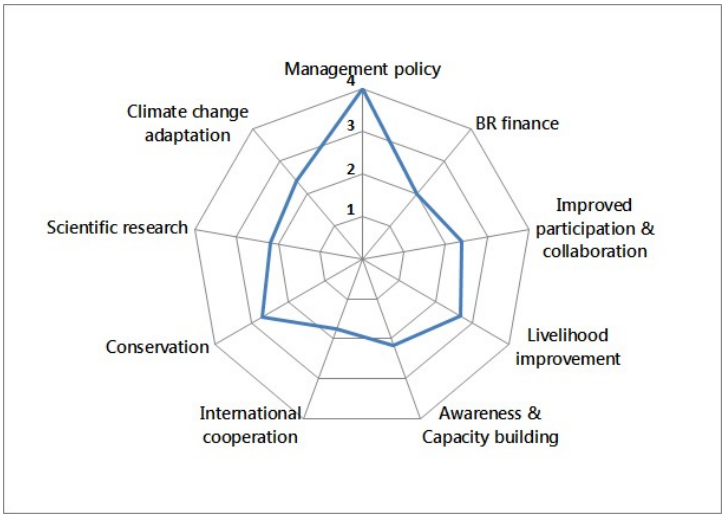

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Figure 4. Management outputs of the KGBR in 2014 and 2015 (1= activities were cancelled; 2= activities are delayed; 3= activities are in implementation; 4= activities are completed).

Management outcomes

Core area coverage. The BRMB is recently cooperating with relevant departments to expand the core area through declaration of the last section of Phu Quoc NP (in the BR core zone). There has also been progress in establishing new PAs to provide legal protection of significant ecosystems and species in the KGBR, such as Phu My Habitat and Species PA, in 2016 which will support to protect the remaining grassland ecosystem and provide homeland for migratory threatened Sarus Cranes (*Grus antigone*). Additionally, Kien Luong limestone out crops and Dong Ho lagoon are planning for establishment of new PAs by 2020 (Figure 5). However, due to the small and fragmented core areas[5], which are surrounded by a large population with high economic development demands, the long-term integrity of these protected ecosystems, species, and associated ecosystem services are unlikely (Carter, 2013).

Biodiversity health. Lack of systematically monitored information and indicators prevented a detailed quantitative analysis of management progress in KGBR. The available information from studies and monitoring reports, and stakeholder workshop only allowed assessing the current condition of seven key ecosystems and it revealed a fairly weak conservation picture in KGBR (Table 5). Only Melaleuca wetland in U Minh Thuong NP was rated as good and its condition is improving as the result of the strong support from GIZ/DFAT project and investment from central government and province in improving water management practice applied since 2009 (Cuong & Dart, 2011; Thang, 2013a, b). Table 5 shows that without an increase investment in management and restoration, three ecosystems of coastal mangrove forest, primary and secondary broad-leaf forest in Phu Quoc NP, and seasonally-inundated grassland in Phu My PA will face potential degradation and loss. Particularly, coral reef and sea grass in Phu Quoc MPA, Dong Ho lagoon and limestone outcrops in Kien Luong are being degraded from excess harvesting of marine life, destructive fishing, limestone quarrying, the expansion of shrimp production, land reclamation for tourism and urban development, and water pollution.

[4] Although there is no quantitative guidance and indicator from UNESCO about the BR zonal partition, Lourival et al. (2011) recommended a minimum of 17 percent of the BR to be allocated in the core zone to meet conservation requirement. In fact, only 3.2 percent of the BR area is designed as core area in Kien Giang.

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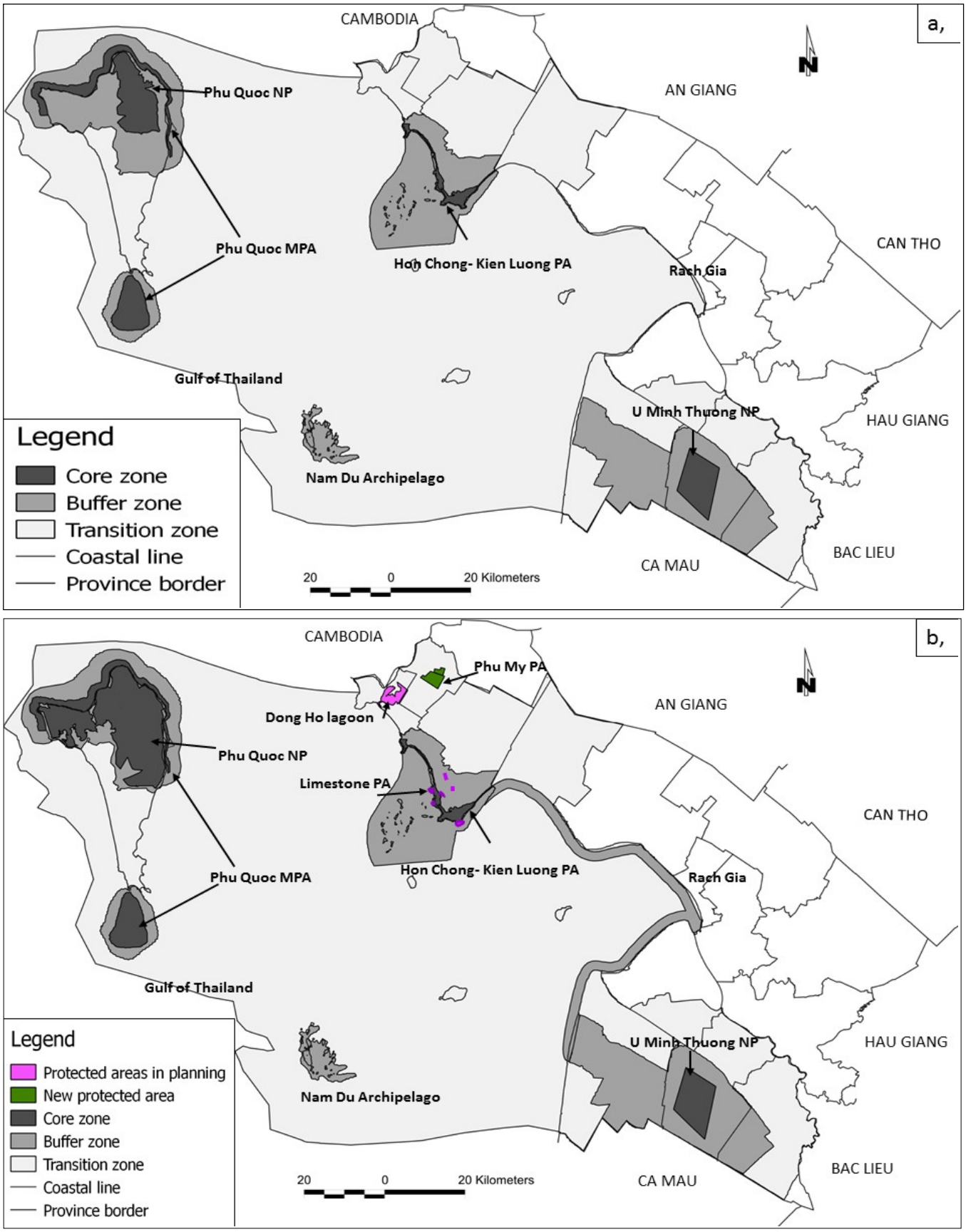

Figure 5. Changes of the core and conservation area in KGBR between 2006 (a) and 2016 (b)

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Table 5. Ecosystem health in the key management sites of the KGBR

Key management sites and ecosystems	Size rating	Rating *	Data sources	References	Management intervention
U Minh Thuong and wetland Melaleuca forest	Good	⬆	Qualitative	Cuong & Dart, 2011; Thang, 2013a,b	Investment in forest fire prevention and fire fighting
Phu Quoc NP and primary broad-leaf forest with dominance of Dipterocarp (Dipterocarpaceae)	Good	⟷	Quantitative	Dang 2009; Cuong & Dart, 2011	Improvement of law enforcement to prevent illegal land encroachment and access to the park
Phu Quoc MPA and coral reef and sea grass	Fair	⬇	Qualitative	Long et al., 2011	Increase investment in site management Staff capacity; improvement of law enforcement; effectively control tourism activity
Kien Luong limestone outcrops	fair	⬇	Quantitative and qualitative	Van & Lam, 2013	Set up PA to increase level of habitat protection
Phu My grassland	Fair	⟷	Quantitative and qualitative	Truyen et al., 2014	Improve habitat management
Dong Ho lagoon	Fair	⬇	Quantitative and qualitative	Tran, 2011; Johnstone, 2013	Set up PA to increase level of habitat protection
Coastal mangrove protection forest	Fair	⟷	Quantitative and qualitative	Cuong et al., 2015	Investment in coastal reforestation and erosion protection

⬆ Good and condition is improved; ⟷ Developing concern and condition is unchanged ⬇ Condition is deteriorating

Discussion

Our case study findings in Kien Giang provided an example of the challenges encountered in effectively implementing the BR model in Vietnam. The lack of basic information on site management together with a consistent monitoring and evaluation system is identified as a common challenge for assessing performance and management effectiveness of sites within the WNBR (Bertzky & Stoll-Kleemann, 2009; UNESCO, 2010). Using evaluation references of identified challenges in implementation of the Madrid Action Plan for BRs (Popelier & Vaessen, 2014), we found many similarities with the case of Kien Giang (Table 6).

Our findings reflected the common issue of scarcity and unavailability of the data and information at site level of BRs and PAs (Bertzky & Stoll-Kleemann, 2009; Geldmann et al., 2013), and this void hinders development of an integrated plan and strategic conservation actions in the KGBR and in similar cases such as Mexican BRs (Pino-Del-Carpio et al., 2014). Key factors causing these deficiencies were identified as the lack of human resource and capacity to collect and generate information,

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unwillingness to publish and share the finding results due to scientific and administrative competitiveness, reluctance of government departments and agencies to provide information that might show the poor performance and management and KGBR is not an exceptional case as other research has shown (Price, 2002; Bertzky & Stoll-Kleemann, 2009).

Table 6. Key challenges to management of BR network and findings in Kien Giang

Key challenges to BR management globally*	Findings in KGBR
Legal framework and policy for BR management	Lack of legal framework and guidance in BR planning and management
Political support at the regional level	Lack of continuity support from PPC and department leaders
Strong regional integration and landscape planning	Artificial constructed BR model and preference for sectoral planning and administrative boundary management
Multi stakeholder partnership and participatory governance	Weak provincial stakeholder and community engagement and support for BR management
Funding and staff capacity to implement BR management plan	BR operation depends on the wills of a part-time and unpaid Management Board
	Incompetence BR staff and no allocated operational funding
Balanced conservation and socio-economic development	Strong economic focus, and conflict between infrastructure tourism investment and ecosystem protection
Monitoring and evaluation for adaptive management	No monitoring and evaluation system for BR in place

* Adapted from Popelier & Vaessen (2014)

The study also revealed recent concern of losing insightful and valuable information of the BRs if no additional efforts are paid to collect and manage data and information properly, which are found in the WNBR (Lotze-Campen et al., 2008). Therefore, it is necessary to establish an organized system to collect and update information together with preparation of the periodic review process for future and sharing of information, planning, and adaptive management.

The MABR and BRs support for a place based governance structure and appropriate local arrangement in planning and management of sites (Francis, 2004; Edge & McAllister, 2009), but it requires a strong and continual local leader support and stakeholder commitment to integrate different sectors' agenda and interests in the regional landscape (Ishwaran, 2010). However, our findings in the case of KGBR revealed that the BR concept is really an artificially constructed model with little buy-in from agencies of government and limited efforts to pursue an adequate planning and implementation process. Inconsequently, the BR is of limited relevance to stakeholders who strongly rely on a legally-based, sectoral planning, and administrative systems. Consequently, the practical planning and management of the site did not follow the ecosystem approach and principles as outlined by UNESCO (UNESCO, 1996; 2000). Lack of clear understanding about the BR approach and the potential benefits of the model can arise from insufficient communication (UNESCO, 2010; Cuong et al., 2017a, b) as was the case with KGBR. Strikingly, local communities and the private sector who are the key natural resource dependant entities and who are the main source of threats were not included sufficiently in BR planning and management. Without local community support and engagement, BR management failure is likely (Stoll-Kleemann & Welp, 2008; Coetzer et al., 2013; Reeds & Massie, 2013; Cuong et al., 2017b) and this is well demonstrated in the case of KGBR.

Lack of human capacity and management resources remains a challenge in BR implementation and delivery (Popelier & Vaessen, 2014; Cuong et al., 2017b). Having key people representing the local authorities (Province and district People Committees), provincial departments, NPs, and PAs involved in the BR governance should theoretically provide an advantage in coordinating and

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facilitating BR activities across sectors. However, because of a lack of willingness and an absence of effort from the Management Board, the management objectives of the KGBR are unlikely to be achieved as the cases of many other BRs in the global network (Schultz et al., 2011). Our case study also highlighted the need to have a secure operational fund for delivering BR functional requirements (e.g., BR awareness, ecosystem and species conservation, and sustainable livelihood projects) rather than only allocating resources for administration and office operations. When the law enforcement is not strong due to the lack of management resources, the BR values and biodiversity are unlikely to be protected from threats and pressures of illegal access and exploitation (UNESCO Hanoi, 2013; Brook et al., 2014; Cuong et al., 2017a) as was evident in KGBR. Additionally, sustainable economic and livelihood development using eco-tourism and BR labels for local products and services was considered as one of the most significant advantages from BR listing (UNESCO, 2008; 2010; Cuong et al., 2017b), but this initiative was not promoted sufficiently in KGBR. Over emphasis on (tourism) infrastructure development in the sensitive and pristine conservation areas not only leads to destruction of ecosystems and biodiversity values but also compromises the future usage of these values and associated ecosystem services (Carter 2013; Godfrey, 2016). Thus, completion of BR planning and management plan will provide a long-term visions and strategic solutions to improve management process and promote using BR approach for balancing conservation and sustainable provincial socio-economic development.

Conclusion

The evaluation of management effectiveness using EoH Toolkit revealed an overall gap between the aims of the BR establishment and practical management capacity at the specific site level. We identified three main hindrances to ineffective management process and outcomes of the BR in Kien Giang: (1) Lack of legal framework and clear guidance about BR planning and management, (2) lack of stakeholder understanding of the BR approach and their engagement in planning and implementation process, and (3) lack of management capacity and resources supported for meaningful BR functioning requirements.

Management effectiveness evaluation is recommended as "a positive process, which allows us to correct and learn from our mistakes and build on success" (Hockings et al., 2006). This evaluation activity not only assists the provincial officials, BRMB and other local stakeholders to understand the current limitations but supports development of strategic solutions to improve BR performance and management effectiveness. While periodic review is still a key evaluation process to ensure compliance between the BR conceptual model and application reality, and management effectiveness of individual BRs (UNESCO, 1996b, 2016a), this assessment approach that mainly bases on qualitative and descriptive information would not allow measuring BR management outputs and outcomes (Matar & Anthony, 2017). Thus, quantitative and qualitative information generated from using EoH evaluation provides a baseline data that can be used for future monitoring and evaluation and adaptive planning and management of the BR model.

SUPPORTING INFORMATION
Appendix (attached)

AUTHOR INFORMATION

Corresponding Author

Van Cuong Chu
Email: v.chu1@uq.edu.au

Present Addresses

School of Earth and Environmental Sciences, The University of Queensland, St Lucia Campus, Brisbane, Australia, QLD 4072

Author Contributions

Van Cuong Chu (85 percent), Marc Hockings (10 percent), and Peter Dart (5 percent)

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