Electronic Green Journal
Volume 1, Issue 50

Doing the Right Things Right: Identifying the Factors that Influence the Success or Failure of Conservation Programs Using the Conservation Excellence Model

Marianne Allison G. Lee, Grace Ingram, Naing Lin, Erwin Amavassee, Jim J. Groombridge
Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Jamieson A. Copsey
IUCN SSC Conservation Planning Specialist Group, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124, USA

Regine Weckauf
Fauna & Flora International, David Attenborough Building, Pembroke Street Cambridge CB2 3QZ, United Kingdom

Simon A. Black
Durrell Institute of Conservation and Ecology, University of Kent, Canterbury, United Kingdom
Wildwood Trust, Canterbury Rd, Herne Common, Herne Bay CT6 7LQ, United Kingdom

Abstract

The increasing rates of biodiversity loss and global warming necessitate the implementation of conservation interventions with the highest likelihood of success, given limited resources. Using criteria within the Conservation Excellence Model, the authors comparatively analyzed the core conservation processes of 25 conservation programs in Southeast Asia and identified the factors that influenced program success. Eight key factors emerged: Stakeholder Involvement, Process Selection and Management, Activity and Impact Monitoring Systems, Measurable Goals and Objectives, Evidence-based Approach, Adaptability and Innovativeness, Political Will, and Sustainable Financing. The authors described a management approach that illustrates how identifying measurable goals and objectives enables program success. Additionally, the authors demonstrated the benefits of using both value and technical judgments in developing interventions, shifting from activity to impact monitoring, and integrating learning and innovation into interventions. The authors also found that programs can better overcome operational barriers and increase the likelihood of sustainable outcomes by deepening engagement with conservation partners.

Introduction

Southeast Asia is a biodiverse region that is also experiencing some of the greatest losses of biodiversity (Gray et al., 2018; Weiss, 2009)—necessitating the design of conservation projects that will generate impactful and meaningful outcomes despite the limited resources available to conservation (Kapos et al., 2009). Evaluations and improvements in the success of conservation programs have therefore usually considered project relevance, the effectiveness and efficiency of teams to meet project goals, and the forecasted sustainability of outcomes (Kapos et al., 2009). However, while there is an abundance of material advocating approaches to the planning of conservation programs and work (CMP, 2020; CPSG, 2020; Dudley, 2013), there are few studies of the actual management and improvement of conservation processes that specifically deliver the work on the ground (Black & Copsey, 2018). This has resulted in poor understanding of how the design and improvement of conservation approaches quickly improves the impact and effectiveness of efforts undertaken.

In Southeast Asia, some of the challenges to measuring conservation success have included the failure to have clear conservation objectives, poor data management on project results and effectiveness, lack of measurable targets related to conservation outcomes, lack of incentives to ramp up monitoring and evaluation activities, and differing priorities between conservation practitioners, policy-makers, and donors (Kapos et al., 2008; Saterson et al., 2004). In addition, the conservation sector is not seen as particularly effective in applying learning, innovation, and improvements (Black & Copsey, 2018; Catalano et al., 2018, 2019).

In this study, the authors aim to demonstrate the usefulness of the Conservation Excellence Model (CEM) presented by Black and Groombridge (2010) in identifying what factors influence the success or failure of conservation programs implemented in Southeast Asia. The CEM requires programs to articulate their project purpose and goals, make decisions based on scientific evidence, and involve people in the continuous refinement of processes to improve results (Black & Groombridge, 2010). The approach has been used on nearly 100 programs both large and small (Black, 2021, 2024) and is built on a framework from tried and tested Business Excellence Models that considers approaches to organization management, approaches to natural systems management, and improvements to specific areas under these not found in other conservation models (Amavassee et al., 2022; Black et al., 2013; Moore et al., 2020; Silva et al., 2022).

The left half of the model describes the five approach criteria which evaluate how well technical conservation activities (Core Conservation Processes) and management activities (Leadership, People and Community Management, Resource Management, Policy and Strategy) are carried out by conservation organizations to achieve its purpose. Meanwhile, the right half of the model describes the results criteria. These criteria are concerned with measuring the performance of conservation organizations against program objectives, financial results, and other program milestones relating to local communities, the wider society, and biodiversity (Fig. 1).

For this study, conservation programs were assessed only on three criteria, namely: *Core Conservation Processes*, *Biodiversity Results*, and *Conservation Program Results* (Black & Groombridge, 2010). A focused assessment considering these three criteria not only zoomed into how the factors, events, or circumstances that influence *Core Conservation Processes* impact the capacity and capability of projects to deliver *Biodiversity Results* and *Conservation Program Results*, but also fit the best model for assessing process effectiveness, namely "demand", "value", and "flow" (Seddon, 2005). The Conservation Excellence Model defines "demand" as a reduction in threats and improvement of the status of biodiversity as dynamic over time i.e. *Biodiversity Results*, "value" as measurable *Conservation Program Results* which are operational deliverables rather than just activities, and "flow" as the management and improvement of *Core Conservation Processes.*

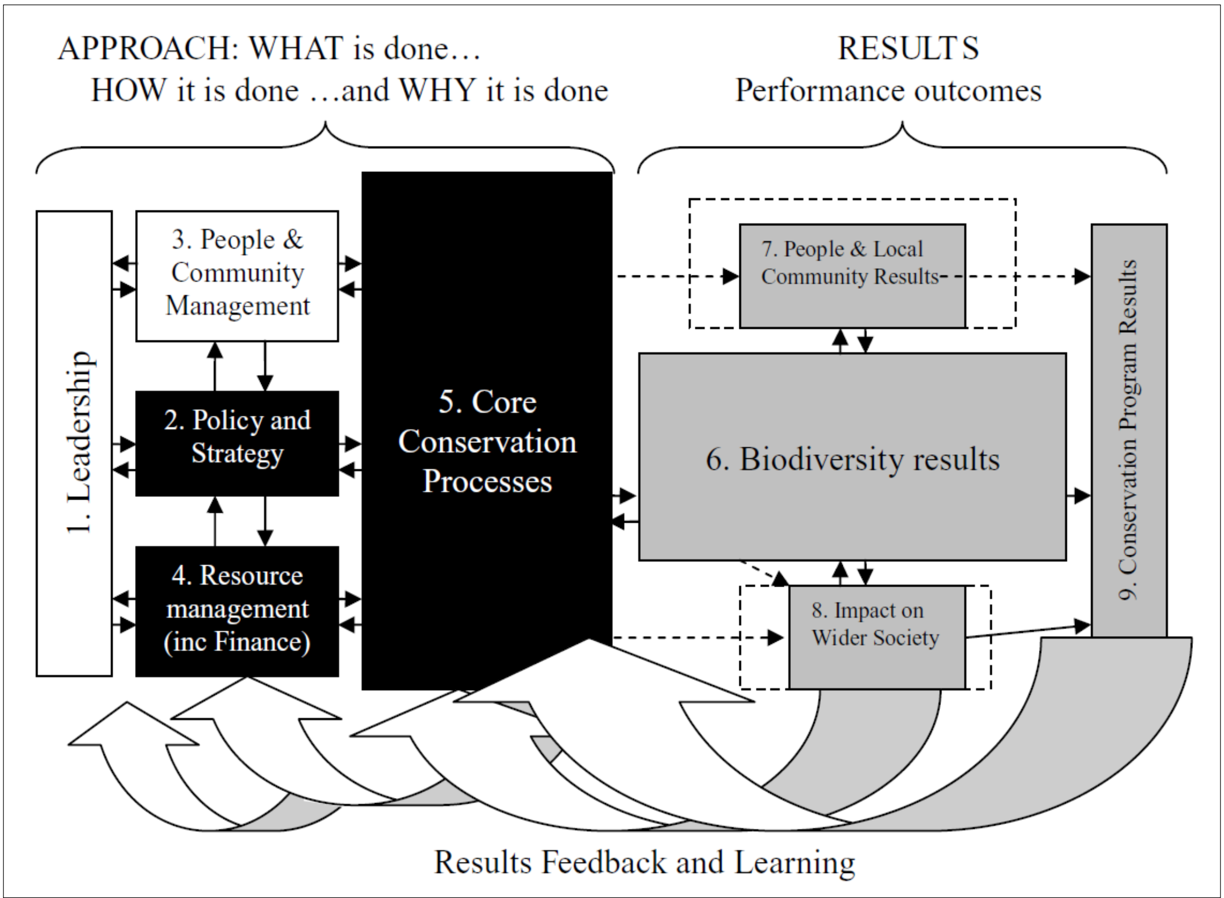


Fig. 1. The Conservation Excellence Model presents a new way of assessing conservation program success by adapting best practices from tried and tested business excellence models. Source: Black & Groombridge (2010)

Methods

Developing case studies of conservation programs

Conservation programs were selected for assessment using convenience sampling, but with the following practical considerations in mind: geographically implemented in Southeast Asia (SE Asia) due to it being a biodiversity hotspot, with publicly accessible project documentation reports, and with information on both biodiversity and conservation program results. A two-to-three-page case study document was developed for each program containing the following information: project overview (including project context/purpose, objectives/goals, location, species/ecosystems of interest, supporting tables, figures, and maps as required), the core conservation processes implemented as articulated by the program staff or by the lead researcher for the evaluation only, biodiversity results, and conservation program results. The format of case studies followed the framework used in previous studies (Amavassee et al., 2022; Black et al., 2011; Moore et al., 2020; Silva et al., 2022). A sample of seven of the cases was reviewed independently by one of the co-authors (who has experience of assessing over 100 organizations, projects and programmes using the CEM) to confirm the consistency and adequacy of case information as valid for CEM assessment. A total of 25 case studies on conservation programs that were implemented between 2001 and 2021 were developed for the assessment (Table 1).

Table 1. The number of conservation programs assessed per Southeast Asian country.

Country	Number of programs assessed
Cambodia	4
Indonesia	4
Lao PDR	2
Malaysia	3
Myanmar	3
Philippines	4
Thailand	3
Timor-Leste	1
Vietnam	1

Source: The Authors

Independent third-party assessments

Between June and July 2022, the case studies were distributed to eight CEM assessors that were selected based on their expertise and knowledge in conservation planning and project management across various conservation approaches spanning different geographical areas (see Appendix A). The group of assessors assigned to review the cases included three from the UK, two from the USA, one from the Philippines, one from Myanmar, and one from Mauritius, but all of whom have professional experience of CEM assessment of organizations in Southeast Asia. Before being assigned to a case sample, the assessors' institutional affiliations were reviewed to avoid potential conflicts of interest and to reduce potential biases and preconceptions associated with assigned cases. Appendix A summarizes the background of the assessors. All the assessors had previously received training on the use of the CEM and have had experience using the model to assess conservation programs.

Table 2. Distribution of the case studies across the four broad categories of conservation approaches and the expert assessors assigned to each.

Conservation Approach	Case Study No.	Assigned Expert Assessor
Species Management and Conservation Approach	CEM013	EA-3, EA-4, EA-6
	CEM014	EA-3, EA-8
	CEM015	EA-3, EA-4
	CEM031	EA-1, EA-3, EA-5
	CEM035	EA-3, EA-5, EA-8
Ecosystem Management and Conservation Approach	CEM003	EA-3, EA-5, EA-8
	CEM009	EA-2, EA-3, EA-5
	CEM025	EA-3, EA-4, EA-5
	CEM027	EA-1, EA-3, EA-6
	CEM028	EA-2, EA-3, EA-7
Cross-sectoral Integration across National Strategies and Institutional Development Approach	CEM001	EA-2, EA-3, EA-6
	CEM004	EA-3, EA-5, EA-8
	CEM005	EA-2, EA-3, EA-8
	CEM012	EA-3, EA-4
	CEM017	EA-3, EA-6
	CEM018	EA-2, EA-3
	CEM019	EA-1, EA-3, EA-7
	CEM026	EA-3, EA-4, EA-8
	CEM033	EA-1, EA-3, EA-5
Poverty Reduction, Livelihood Diversification, and Cultural Approach	CEM002	EA-2, EA-3, EA-7
	CEM006	EA-3, EA-8
	CEM007	EA-3, EA-5, EA-8
	CEM010	EA-3, EA-6, EA-7
	CEM016	EA-1, EA-3, EA-5
	CEM034	EA-2, EA-3, EA-7

Source: The Authors

Each case study fell into one of four broad categories of conservation approaches, namely: Species Management and Conservation Approach, Ecosystem Management and Conservation Approach, Cross-sectoral Integration across National Strategies and Institutional Development Approach, and the Poverty Reduction, Livelihood Diversification, and Cultural Approach.

Each conservation program was scored six times by the expert assessors—*Core Conservation Processes* was scored twice for ‘Approach’ and ‘Deployment’ then averaged, while *Biodiversity Results* and *Conservation Program Results* were each scored for ‘Results’ and ‘Scope’ then averaged. Each conservation program received three final scores. Expert assessors were also asked to respond to some guide questions aimed at unraveling what factors impacted the ability of the conservation program to achieve program goals or objectives.

Quantitative and qualitative analyses of results

Expert assessors' scores were collated and then plotted to check for variability between the scores. Thereafter, the mean score for each criterion was calculated for each conservation program. The projects were then ranked and categorized based on their scores for *Core Conservation Processes*. The score bands were 0%-24%, 25%-49%, 50%-74%, 75%-99%, 100% corresponding to levels of excellence scores on the standard CEM scoring scale (see Appendix B). The differences in scores in each and across the conservation programs were checked against the qualitative feedback provided by the assessors to pinpoint what led to these differences. Qualitative analysis was completed using NVIVO v.1.6.1. A line-by-line review of all of the assessors' feedback was undertaken to identify the key factors that the assessors flagged as influencing conservation program success or failure.

Results

A total of 207 scores were received from all eight CEM assessors (see Appendix C). A Systems Behaviour Charts analysis showed that all the scores fit within natural limits with no unexpected patterns of high or low scores. This suggested that no external factors of assessor competence, case-study information, or assessment method unnaturally affected the scoring process. As such, the scores can be considered reliable and valid across the data set (see Appendix D). From the assessment, only one conservation program received an overall mean criterion score above 75% for its *Core Conservation Processes,* with the majority of the programs receiving scores between 50% and 74%.

Eight categories of conservation programs emerged from this exercise, with the majority of conservation programs having higher scoring *Core Conservation Processes* (72%). When considering the ratings received by each conservation program's *Core Conservation Processes* (CCP), *Biodiversity Results* (BDR), and *Conservation Program Results* (CPR), there was no combination of ratings where lower scoring *Core Conservation Processes* led to either or both high scoring *Biodiversity Results* and *Conservation Program Results*. For this sample of conservation programs, those with poorly designed and implemented *Core Conservation Processes* inevitably resulted in both lower scoring *Biodiversity Results* and *Conservation Program Results* (Fig. 2.).

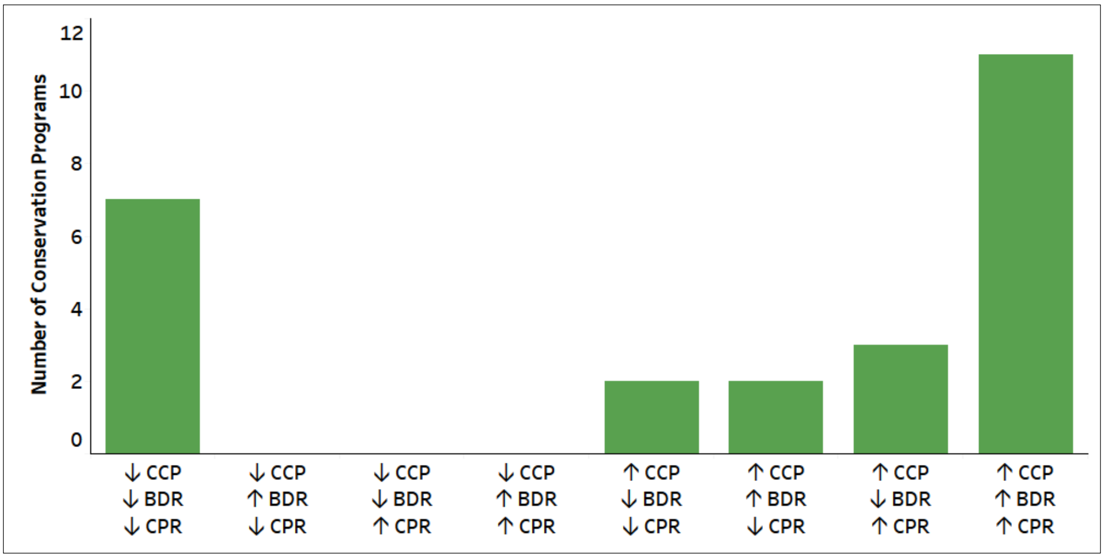


Fig. 2. Distribution of the conservation programs across the different process-result categories. Source: The Authors

Analysis of the qualitative feedback revealed eight key factors that assessors identified as influencing conservation program success or failure, namely Stakeholder Involvement, Process Selection and Management, Activity and Impact Monitoring Systems, Measurable Indicators, Evidence-based Approach, Adaptability and Innovativeness, Political Will, and Sustainable Financing (Table 4). Stakeholder involvement (28.4% of all references) and Process Selection and Management (14.9%) were referenced the most across all the 25 conservation programs, while Political Will (6.5%) and Sustainable Financing (4.4%) were referenced the least (Table 3).

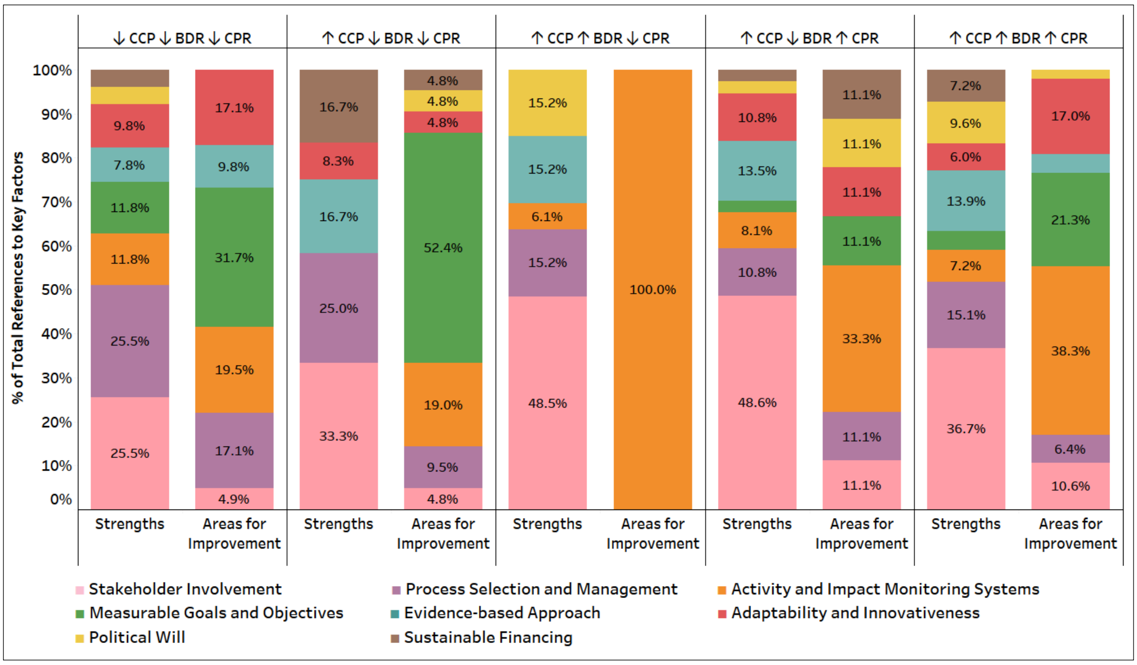


Fig. 3. Percentage of total references to the eight key factors influencing success or failure in the qualitative feedback grouped by process-result pair. Source: The Authors

Table 3. The 8 key factors identified as influencing conservation program success or failure and the number of references made to these factors in the assessor feedback.

	Key Factors	Description	References in-text
1	Stakeholder Involvement	• Inclusion of stakeholders in decision-making • Availability and provision of learning and capacity building opportunities • Aiding in the establishment of local businesses or community organizations • Partnerships with NGOs, civil society, academic institutions, and the private sector • Conflict with and among stakeholders due to differing needs and priorities e.g. land tenure, establishment of protected areas, etc.	28.4% (122)
2	Process Selection and Management	• Coherence and alignment of selected processes with program vision, purpose, and objectives • Completion or failure to complete end to end delivery of program activities	14.9% (64)
3	Activity & Impact Monitoring Systems	• Procedures in place to measure the number of activities implemented, milestones achieved, stakeholders reached, and sustainability and impact of interventions (e.g. surveys, METT, behavior change, incomes, etc.)	14.6% (63)
4	Measurable Indicators	• Appropriateness, thoroughness, and specificity of selected indicators and goals as measures of success in relation to program vision, purpose, and objectives	11.6% (50)
5	Evidence-based Approach	• Availability, lack, or poor access to baseline data needed to inform strategies • Use of scientific evidence or conduct of feasibility studies, market studies, socio-economic surveys, stakeholder analyses, and the like to inform conservation strategies	10.5% (45)
6	Adaptability & Innovativeness	• Incorporation of learning and applying best practices learned into program activities • Evidence of adapting or modifying activities based on stakeholder priorities, unforeseen circumstances, or infeasibility of planned interventions	8.8% (38)
7	Political Will	• Uptake or conflict over proposed policy reforms management recommendations (e.g. PA management, habitat and species monitoring, zonation and land use plans, etc.) • Endorsement and provision of support (human or material resources) to program activities and allocation of government funds to ensure continuity of program interventions • Participation in program activities like trainings and workshops to increase law enforcement capacity, mainstream local conservation strategies into development plans, or build skills in GIS, etc.	6.5% (28)
8	Sustainable Financing	• Availability, lack, and smart use of funds needed to carry out program activities • Ability of the program to identify, secure, or create sustainable and increasing amounts of funding from diverse sources	4.6% (20)

Only Stakeholder Involvement was highly referenced as a strength and minimally referenced as an area for improvement across all the conservation programs (Fig. 3.). There was no trend for this key factor, suggesting that the inclusion of stakeholder involvement is no longer a recommendation but rather a fixture in conservation programs (Kainer et al., 2009). Process Selection and Management was referenced more by assessors as an area for improvement in programs with lower scoring *Biodiversity Results*. An Evidence-based Approach was referenced more as an area for improvement in programs with both lower scoring processes and lower scoring results. Results suggested that these two key factors are critical in the planning phase of conservation programs as it primarily concerns working with or acquiring the information base that will inform and rationalize the selection of conservation processes, the selection of program activities under each process, and the management actions that will ensure the end-to-end delivery of the selected processes.

Having Measurable Goals and Objectives, having Activity and Impact Monitoring Systems, and Adaptability and Innovativeness were identified by assessors as areas for improvement across all the conservation programs. The three key factors were identified as being interrelated and concerned with the implementation of program activities, how the success of program activities is measured, and how program activities respond to changing circumstances and resources. Assessors noted that some conservation programs missed measuring certain indicators that could have allowed for a better understanding of how interventions were creating lasting impacts on species, ecosystems, and communities. Assessors also noted where programs had integrated learning and improvement into the development of the project. They specifically pointed out changes in selected processes when those processes were not delivering the desired results or developing mitigation strategies in the event of unforeseen circumstances.

No clear trends were observed for both Political Will and Sustainable Financing. However, both were referenced as a strength in programs with higher scoring processes and an area for improvement in programs with lower scoring *Biodiversity Results*. Under Political Will, references were made to instances of collaboration with government resulting in the upscaling and replication of program interventions or instances of competing interests with government. It also consisted of feedback on government participation in program activities and the uptake of policy and management recommendations made by the program. For Sustainable Financing, assessors noted whether conservation programs were able to secure, increase, and diversify funding streams or create self-financing mechanisms (e.g. evidence of local livelihoods gaining profits) for partner stakeholders. Unlike the others, the three key factors with no clear trends, namely Stakeholder Involvement, Political Will and Sustainable Financing were not considered by assessors to form part of the process of conservation program development. They were either a strategy under a conservation process or a consideration in the development process, suggesting that they may be thought of as factors that may not necessarily predict the success of conservation programs but rather increase the likelihood of conservation programs to succeed.

Discussion

Informative Measures of Progress

Biodiversity is a meta-concept that integrates concepts of diversity at the genetic, species, and ecosystem levels (Cordero-Rivera, 2017). As such, conservation interventions cannot be defined by a singular specific species, habitat attribute, nor specific management objective. In order for biodiversity to become a manageable objective, it must first be qualified (Failing & Gregory, 2003) in both biodiversity terms (e.g. population status, habitat quality, threat reduction) and operational terms such as work deliverables (Black & Copsey, 2018). Through conservation planning, conservation practitioners and scientists identify program purpose and vision, goals and objectives, and indicators aimed at conserving and protecting biodiversity (Byers et al., 2022). Program purpose is the underlying reason for the direction taken by a conservation program, a vision (of which there can be many) is the desired outcome for biodiversity (Black, 2015, 2024), goals and objectives are the measures of how much of the outcome needs to be achieved in a specific time, while indicators measure progress in achieving set goals and objectives (Schwartz et al., 2018; Villarreal-Rosas et al., 2020).

Having measurable goals and objectives as an area for improvement across all the conservation programs highlighted the need for project indicators to be more specific in reflecting program purpose and vision, the constraints in which it was operating and the level of performance needed to achieve the desired outcomes for biodiversity (Davies et al., 2014; Tulloch, 2015). This failing is characteristically labeled as having "goals without methods" and is a particular challenge of learning that is not unique to conservation but needs to be resolved by conservation managers (Black, 2024; Deming, 1986). Practitioners may sometimes forget that the process critical to achieving the goal and which is defined by a clear and relevant purpose is more important than the goal itself.

Understanding the Status of Biodiversity

In addition, while the indicators selected by the conservation programs appeared able to measure and answer questions about biodiversity (e.g. species numbers, water quality index, decline or increase in poaching activities), there were not enough indicators to allow for a judgment about the status of biodiversity itself (Davies et al., 2014; Failing & Gregory, 2003). A list of indicators that describe the characteristics of an ecosystem after the implementation of a conservation intervention may not always allow for the inference of how well the ecosystem is functioning. The assessors had this feedback to support this:

> *"The given biodiversity results are all related to coastal areas, while the project looks at establishing effective MPAs, it's missing biodiversity indicators that are directly related to marine areas."*
>
> *"As with biodiversity results, there are indications that the system may be more complex than the project is currently set up to deal with. For example, the increase in the number of violations recorded could suggest that the project is doing what it should do; or it could indicate*

that other factors are at play that need to be understood and managed accordingly."

"Project would have benefited from conducting studies on the species in the wetlands— indicator species can give information on ecosystem health."

The Knowledge-Action Gap in Conservation

The importance of an evidence-based approach to selecting goals and indicators has been highlighted across studies of conservation programs (Doherty & Ritchie, 2017; Sutherland et al., 2004). However, the preoccupation with data availability may be misdirected towards how much or how little data is available, otherwise known as the knowledge-action gap. Instead, utilizing existing knowledge to pinpoint underlying uncertainties in the data and translating this into management decisions and actions is a skill that can be developed and nurtured by scientists and conservation practitioners alike (Cook et al., 2013; Roche et al., 2022). This is not to say that practitioners should not endeavor to fill in the gaps in the data through baseline surveys, stakeholder analysis, and feasibility studies. Rather, making informed value judgments alongside technical judgements (i.e. decisions based on hard data) is just as valuable in conservation programs especially where cost-effectiveness is considered (Failing & Gregory, 2003; D. B. Lindenmayer et al., 2012; Tulloch, 2015).

Basis of Process Selection and Management that will Deliver Results

Commonly, the selection and prioritization of goals and indicators impacts the type of processes, management approaches, and modes of monitoring that are selected for conservation programs and vice-versa (Stephanson & Mascia, 2014). However, process selection and design should be based on purpose (Black, 2015). As a consequence, while the assessed conservation programs had conservation processes that adhered to program goals and objectives, these processes were not always accompanied by concrete actions that impact biodiversity. The lack of concrete actions under the selected processes then informed the type of information that was being recorded and monitored by the monitoring systems that the conservation programs had in place.

To illustrate, an assessor shared this feedback for two different conservation programs:

"Process one is not a process (it is a support process—policy and strategy)—many conservation organizations love planning as they think it is doing conservation, but frankly it is not. It is the work of management."

"Policy processes are fine for delivering policy but need to be accompanied into concrete improvement/intervention processes that affect environmental change–or we are just measuring 'management' not work. This is why approaches like 'setting

> *climate targets' do not deliver change, but simply keep politicians feeling busy."*

Anticipating and Monitoring Results Time Lags

The existence of what seems to be a "conservation program result-pairing" that is higher scoring processes, higher scoring program results, and lower scoring biodiversity results may be explained by the time-lag that exists between the actions aimed at conserving biodiversity and the biodiversity gains being produced (Gibbons et al., 2011). It would be ideal to be able to measure changes in species population numbers within a short timeframe (Tulloch, 2015). However, this is not possible due to the impacts of the drivers of species extinction and the time that it takes to be able to measure birth and mortality rates, among other factors (Gosselin & Callois, 2021). Considering this time-lag, conservation programs would benefit from implementing monitoring mechanisms that can both measure and predict the long-term impact of conservation processes on biodiversity (Failing & Gregory, 2003). Feedback from the assessors highlighted this difference between activity and impact monitoring:

> *"A lot of species were identified, inventoried, and mapped; are there any studies to determine if their respective populations are declining?"*

> *"Once the enterprises are developed, what happens then? What are the safeguards to ensure that these enterprises will keep going even after the end of the project?"*

> *"If these results can be sustained over the next couple of years, then scores should increase. In addition, a broadening of the reach of the project and the implementation of the management plan should further strengthen biodiversity results."*

Integrating Innovation and Improvement into Processes

Results from activity and impact monitoring systems will also test the adaptability and innovativeness of conservation programs, specifically in situations where the program may succeed in achieving some results for biodiversity but fail on delivering the program purpose (Black, 2015). For example, while captive breeding of the Oribi (*Ourebia ourebi*) in South Africa was deemed successful, reintroduction was a failure with only three of ten birds surviving within two months of release. In response to this, program strategies were recommended to include better scrutiny of husbandry and breeding strategies, genetic management through a studbook, and animal and habitat suitability assessments (Grey-Ross et al., 2009). Adaptability and Innovation was an area for improvement across all the conservation programs, primarily because it was unclear how learning and development was integrated into program activities.

> *"Not much evidence of innovation, for example why is there low uptake on certain livelihood activities?"*

> *"The project relied on specific data collection until the end, instead of weaving in adoption of learning throughout."*

> *"Linking a review of current biodiversity results in relation to conservation processes could help shed light on why certain areas have not experienced the desired or projected change- what can you learn from results so far to improve, change or add to the relevant conservation processes to adopt?"*

Connecting People with the Work to Increase the Likelihood of Program Success

Studies have shown that conservation programs are more likely to succeed when the groups of people who are engaged in the planning and the activities of the program are connected (Lindenmayer et al., 2012; Lees et al., 2021; McAfee et al., 2019). Good communication and standardized expectations across stakeholders from local communities, NGOs, government, academic and research institutions, and the private sector allows for the realization of the full environmental, scientific, social, and economic benefits of conservation programs (Lundquist & Granek, 2005; McAfee et al., 2019).

Involving and engaging stakeholders improves access to contextual baselines (e.g. previous environmental conditions, historical weather patterns, historical species population levels, historical species richness, previous forest cover, historical land-use patterns, previous water catchment resources, etc.) that inform the development of conservation strategies (Dumont et al., 2019; Sawchuk et al., 2015), increases the likelihood of ownership of the program (Shackleton et al., 2019), reduces the likelihood of conflict (Novoa et al., 2018), and allows for wider communication of program results (Reed & Dougill, 2010). This was observed in the conservation programs as well:

> *"Establishing local farmer organizations, involving [communities] in activities and project management, [and] creating alternative [sources of] income [led to a] sense of ownership [of the project] by communities."*

> *"Working with communities to identify points of improvement in the supply chain, increase adoption of sustainable fishery practices, and demonstrating the increased incomes that can be derived from the shift to sustainable fishery practices contributed to project success."*

Engaging Decisive Political Support

Stakeholder involvement and engagement becomes even more important when trying to secure political support. Southeast Asia—the geographic region where the assessed conservation programs were implemented—is home to more threatened species than any other region in the world (Gray et al., 2018). The importance of integrating biodiversity conservation and natural resource management into country development plans is acknowledged and has been achieved (Walther et al., 2016). However, some countries in the region still struggle with securing the political will necessary to implement the multilateral environmental agreements like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Biological Diversity (CBD), or the Convention on Migratory

Species (CMS), among others and make decisive actions at the scale and speed critical to protecting the environment before it is too late because of limited public support for needed changes (Walther et al., 2016).

Political support helps in securing funding (the lack of which is an operational barrier for many conservation programs) for conservation programs by encouraging donor organizations, helps to demonstrate that the conservation program is of national interest, and represents the priorities of specific constituencies, or both (Parks, 2008; Sanders et al., 2021). However, there have been instances in Southeast Asia where long drawn-out bureaucratic processes and corruption have also negatively impacted the willingness of donors to support conservation programs in the region (Van Weerd et al., 2006).

Social Outcomes for Sustainable Success

In 2013, Young et al. found that increased stakeholder involvement (in terms of number of people reached) does not necessarily lead to conservation success. However, it does improve social outcomes like trust, conflict resolution, and learning for target stakeholders leading to an increased likelihood of conservation success (Young et al., 2013). As such, an important consideration in Stakeholder Involvement is depth of engagement, an area of improvement on which the assessors had this feedback:

> *"[The] project assumes that lack of knowledge of hunting laws and hunting impacts lead[s] to behavior change. When surveying understanding, it seems to miss to record/understand community's views on laws, the likelihood of communities following these, or drivers."*
>
> *"Understanding the variability in income change before and after the project would be helpful, as several communities seem to be experiencing no positive change or are worse off. This suggests other forces at play—worth understanding what these are and how the project could influence them."*

As such, it is worthwhile for conservation programs to consider how well they are creating lasting and meaningful relationships with the people they are working with to achieve sustainability of interventions and outcomes (Sheil & Boissière, 2006).

Conclusion and Recommendations

Through the CEM, eight factors were identified as influencing the success or failure of conservation programs. Of these eight factors, five factors were identified as predicting the success of conservation programs. In order of importance according to the assessors, these were Process Selection and Management, Activity and Impact Monitoring Systems, Measurable Indicators, Evidence-based Approach, and Adaptability and Innovativeness.

The design of successful and meaningful conservation programs rests on the capability of conservation practitioners to enable a cycle of learning and improvement—beginning with identifying conservation program purpose (Black, 2015, 2024). When the program purpose has been identified and understood, practitioners can then begin working towards describing the goals and objectives that could deliver the desired results for biodiversity, identifying the specific actions needed to achieve these goals and objectives, and designing the impact-based monitoring and evaluation framework that would allow practitioners to see and demonstrate the gains that they have achieved for biodiversity and their stakeholders. Working towards achieving this purpose is truly an effortful undertaking that necessitates intention, openness, and collaboration.

When identifying and articulating the goals and objectives that could deliver the desired results for biodiversity, it is worth putting in the effort to identify the methods and processes that could achieve these goals and ensure sustainability of outcomes in the long-term. In the design of monitoring and evaluation frameworks, interim measures of success have often been regarded as distracting from the bigger picture, but these interim measures may be useful in predicting the outcome of longer-term biodiversity measures especially when they are measurable, rational, and build on lessons learned (Watts et al., 2020). For example, setting an objective to plant a number of trees by a specified time frame (interim measure) should relate directly and must not detract from how the program purpose (increase diverse forest cover) is operationalized or made to happen. Shifting from activity monitoring to activity and impact monitoring reveals “how” program teams rationalize “what” they do—when considering cost-effectiveness and efficiency—to bring them closer to achieving the program “why”, namely its fundamental purpose.

In some cases, conservation interventions may succeed in achieving some results for biodiversity but fail to deliver the program's purpose. Here, it is critical to harness the expertise and knowledge of program teams to make sense of the results provided by feedback and monitoring mechanisms (Failing & Gregory, 2003). Adapting and innovating conservation interventions in response to these failures not only builds on existing expertise and strengthens the knowledge base, but also perpetuates the cycle of learning and improvement from which other practitioners and partners in conservation can learn.

Finally, the last three factors identified as influencing conservation program success and failure include, in order of importance, Stakeholder Involvement, Political Will, and Sustainable Financing. Unlike the other five factors which were seen as predicting the success of conservation programs, these three factors were found to increase the likelihood of success of conservation programs as it requires conservation practitioners to be able to demonstrate to partners (e.g. local communities, other conservation groups, government, etc.) that their conservation program is grounded on a vision that is achievable, evidence-based, and full of potential for future investment.

It is known and understood that conservation programs are more likely to succeed when the groups of people who are engaged in the planning of activities and who stand to gain or benefit from conservation programs are well-connected. As mentioned earlier, good communication and standardized expectations across stakeholders from local communities, NGOs, government, academic and research institutions, and the private sector allows for the realization of the full environmental, scientific, social, and economic benefits of conservation programs (Lundquist & Granek, 2005; McAfee et al., 2019). More importantly, it enables and ensures ownership of the program among stakeholders and increases the likelihood of continuity even after the program has ended.

As such, the findings from the study confirm the breadth of expertise and work in the conservation sector, but also present opportunities in improving the sector's depth of work. Given the scale and speed at which the conservation sector needs to work to protect biodiversity before it is too late, it matters that the work we do makes the best use of the expertise and resources available to enable us to do the right things within the conservation sector.

—---

Marianne Allison G. Lee <marianneallisongl@gmail.com>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Jamieson A. Copsey <jamie@cpsg.org>, IUCN SSC Conservation Planning Specialist Group, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124, USA

Grace Ingram <ingramgracet@gmail.com>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Naing Lin <nilzmw@gmail.com>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Erwin Amavassee <aerwinjayson@gmail.com>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Regine Weckauf <regine.weckauf@gmail.com>, Fauna & Flora International, David Attenborough Building, Pembroke Street Cambridge CB2 3QZ, United Kingdom

Jim J. Groombridge <J.Groombridge@kent.ac.uk>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom

Simon A. Black <drsimonblack@gmail.com>, Durrell Institute of Conservation and Ecology, University of Kent, Canterbury CT2 7NR, United Kingdom and Wildwood Trust, Canterbury Rd, Herne Common, Herne Bay CT6 7LQ, United Kingdom

References

Amavassee, E., Lee, M., Ingram, G., & Black, S. A. (2022). Using the conservation excellence model to improve ecosystem restoration undertaken by organizations working in biodiversity hotspots. *International Journal of Avian & Wildlife Biology*, *6*(1), 11–19. https://doi.org/10.15406/ijawb.2022.06.00178

Black, S. A. (2015). A Clear Purpose is the Start Point for Conservation Leadership. *Conservation Letters*, *8*(5), 383–384. https://doi.org/10.1111/CONL.12203

Black, S. A. (2021). *Evaluating Project Effectiveness: The Conservation Excellence Model* [Webinar]. https://www.youtube.com/watch?v=iePBJwIH8xk

Black, S. A. (2024). *Conservation Leadership: A Practical Guide*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9781003041917/conservation-leadership-simon-black

Black, S. A., & Copsey, J. A. (2018). What Are We Trying to Achieve and How Do We Get There? In J. A. Copsey, S. A. Black, J. J. Groombridge, & C. G. Jones (Eds.), *Species Conservation: Lessons from Islands*. Cambridge University Press.

Black, S. A., & Groombridge, J. (2010). Use of a Business Excellence Model to Improve Conservation Programs. *Conservation Biology*, *24*(6), 1448–1458. https://doi.org/10.1111/J.1523-1739.2010.01562.X

Black, S. A., Groombridge, J. J., & Jones, C. G. (2013). Using Better Management Thinking to Improve Conservation Effectiveness. *ISRN Biodiversity*, *2013*. https://doi.org/10.1155/2013/784701

Black, S. A., & Leslie, S. C. (2018). Understanding impact of mitigation in waterway control systems on manatee deaths in Florida. *International Journal of Avian & Wildlife Biology*, *Volume 3*(Issue 5), 386–390. https://doi.org/10.15406/IJAWB.2018.03.00124

Black, S. A., Leslie, S. C., Blackett, F. C., & Stalio, M. (2017). Systems behaviour charts for longitudinal data inform marine conservation management. *Journal of Aquaculture & Marine Biology*, *6*(5), 00171. https://doi.org/10.15406/jamb.2017.06.00171

Black, S. A., Meredith, H. M. R., & Groombridge, J. J. (2011). Biodiversity conservation: Applying new criteria to assess excellence. *Total Quality Management & Business Excellence*, *22*(11), 1165–1178. https://doi.org/10.1080/14783363.2011.624766

Byers, O., Copsey, J., Lees, C., Miller, P. and Traylor-Holzer, K. (2022). Reversing the decline in threatened species through effective conservation planning. *Diversity*, *14*(9), p.754. https://doi.org/10.3390/d14090754

Catalano, A. S., Lyons-White, J., Mills, M. M., & Knight, A. T. (2019). Learning from published project failures in conservation. *Biological Conservation*, *238*, 108223. https://doi.org/10.1016/J.BIOCON.2019.108223

Catalano, A. S., Redford, K., Margoluis, R., & Knight, A. T. (2018). Black swans, cognition, and the power of learning from failure. *Conservation Biology*, *32*(3), 584–596. https://doi.org/10.1111/COBI.13045

CMP. (2020). *Open Standards for the Practice of Conservation*. Conservation Measures Partnership.

www.conservationmeasures.organdtheConservationStandards'websiteat:www.cmp-openstandards.org.

Cook, C. N., Mascia, M. B., Schwartz, M. W., Possingham, H. P., & Fuller, R. A. (2013). Achieving Conservation Science that Bridges the Knowledge–Action Boundary. *Conservation Biology*, *27*(4), 669–678. https://doi.org/10.1111/COBI.12050

Cordero-Rivera, A. (2017). Behavioral diversity (ethodiversity): A neglected level in the study of biodiversity. *Frontiers in Ecology and Evolution*, *5*(6), 1–7. https://doi.org/10.3389/FEVO.2017.00007/BIBTEX

CPSG. (2020). *Species Conservation Planning Principles & Steps*. IUCN SSC Conservation Planning Specialist Group.

Davies, T. E., Fazey, I. R. A., Cresswell, W., & Pettorelli, N. (2014). Missing the trees for the wood: Why we are failing to see success in pro-poor conservation. *Animal Conservation*, *17*(4), 303–312. https://doi.org/10.1111/acv.12094

Deming, W. E. (1986). Out of the Crisis. In *Massachusetts: Massachusetts Institute of Technology*. Cambridge University Press.

Doherty, T. S., & Ritchie, E. G. (2017). Stop Jumping the Gun: A Call for Evidence-Based Invasive Predator Management. *Conservation Letters*, *10*(1), 15–22. https://doi.org/10.1111/CONL.12251

Dudley, N. (Ed.). (2013). *Guidelines for Applying Protected Area Management Categories*. IUCN.

Dumont, E. S., Bonhomme, S., Pagella, T. F., & Sinclair, F. L. (2019). Structured Stakeholder Engagement Leads to Development of More Diverse and Inclusive Agroforestry Options. *Experimental Agriculture*, *55*(S1), 252–274. https://doi.org/10.1017/S0014479716000788

Failing, L., & Gregory, R. (2003). Ten common mistakes in designing biodiversity indicators for forest policy. *Journal of Environmental Management*, *68*(2), 121–132. https://doi.org/10.1016/S0301-4797(03)00014-8

Gibbons, J. M., Nicholson, E., Milner-Gulland, E. J., & Jones, J. P. G. (2011). Should payments for biodiversity conservation be based on action or results? *Journal of Applied Ecology*, *48*(5), 1218–1226. https://doi.org/10.1111/J.1365-2664.2011.02022.X

Gosselin, F., & Callois, J. M. (2021). On the time lag between human activity and biodiversity in Europe at the national scale. *Anthropocene*, *35*, 100303. https://doi.org/10.1016/J.ANCENE.2021.100303

Gray, T. N. E., Hughes, A. C., Laurance, W. F., Long, B., Lynam, A. J., O'Kelly, H., Ripple, W. J., Seng, T., Scotson, L., & Wilkinson, N. M. (2018). The wildlife snaring crisis: An insidious and pervasive threat to biodiversity in Southeast Asia. *Biodiversity and Conservation*, *27*(4), 1031–1037. https://doi.org/10.1007/S10531-017-1450-5/FIGURES/1

Grey-Ross, R., Downs, C. T., & Kirkman, K. (2009). Reintroduction failure of captive-bred oribi (Ourebia ourebi). *South African Journal of Wildlife Research*, *39*(1), 34–38.

Kainer, K. A., Digiano, M. L., Duchelle, A. E., Wadt, L. H. O., Bruna, E., & Dain, J. L. (2009). Partnering for Greater Success: Local Stakeholders and Research in Tropical Biology and Conservation. *Biotropica*, *41*(5), 555–562. https://doi.org/10.1111/J.1744-7429.2009.00560.X

Kapos, V., Balmford, A., Aveling, R., Bubb, P., Carey, P., Entwistle, A., Hopkins, J., Mulliken, T., Safford, R., Stattersfield, A., Walpole, M., & Manica, A. (2008). Calibrating conservation: New tools for measuring success. *Conservation Letters*, *1*(4), 155–164. https://doi.org/10.1111/J.1755-263X.2008.00025.X

Kapos, V., Balmford, A., Aveling, R., Bubb, P., Carey, P., Entwistle, A., Hopkins, J., Mulliken, T., Safford, R., Stattersfield, A., Walpole, M., & Manica, A. (2009). Outcomes, not implementation, predict conservation success. *Oryx*, *43*(3), 336–342. https://doi.org/10.1017/S0030605309990275

Lees, C.M., Rutschmann, A., Santure, A.W. and Beggs, J.R. (2021). Science-based, stakeholder-inclusive and participatory conservation planning helps reverse the decline of threatened species. *Biological Conservation*, *260*, 109194. https://doi.org/10.1016/j.biocon.2021.109194

Lindenmayer, D. B., Gibbons, P., Bourke, M., Burgman, M., Dickman, C. R., Ferrier, S., Fitzsimons, J., Freudenberger, D., Garnett, S. T., Groves, C., Hobbs, R. J., Kingsford, R. T., Krebs, C., Legge, S., Lowe, A. J., Mclean, R., Montambault, J., Possingham, H., Radford, J., … Zerger, A. (2012). Improving biodiversity monitoring. *Austral Ecology*, *37*(3), 285–294. https://doi.org/10.1111/J.1442-9993.2011.02314.X

Lundquist, C. J., & Granek, E. F. (2005). Strategies for Successful Marine Conservation: Integrating Socioeconomic, Political, and Scientific Factors. *Conservation Biology*, *19*(6), 1771–1778. https://doi.org/10.1111/J.1523-1739.2005.00279.X

McAfee, D., Doubleday, Z. A., Geiger, N., & Connell, S. D. (2019). Everyone Loves a Success Story: Optimism Inspires Conservation Engagement. *BioScience*, *69*(4), 274–281. https://doi.org/10.1093/BIOSCI/BIZ019

Moore, A. A., Weckauf, R., Accouche, W. F., & Black, S. A. (2020). The value of consensus in rapid organization assessment: Wildlife programmes and the Conservation Excellence Model. *Total Quality Management & Business Excellence*, *31*(5–6), 666–680. https://doi.org/10.1080/14783363.2018.1444472

Novoa, A., Shackleton, R., Canavan, S., Cybèle, C., Davies, S. J., Dehnen-Schmutz, K., Fried, J., Gaertner, M., Geerts, S., Griffiths, C. L., Kaplan, H., Kumschick, S., Le Maitre, D. C., Measey, G. J., Nunes, A. L., Richardson, D. M., Robinson, T. B., Touza, J., & Wilson, J. R. U. (2018). A framework for engaging stakeholders on the management of alien species. *Journal of Environmental Management*, *205*, 286–297. https://doi.org/10.1016/J.JENVMAN.2017.09.059

Parks, T. (2008). The rise and fall of donor funding for advocacy NGOs: Understanding the impact. *Http://Dx.Doi.Org/10.1080/09614520801899036*, *18*(2), 213–222. https://doi.org/10.1080/09614520801899036

Reed, M. S., & Dougill, A. J. (2010). Linking degradation assessment to sustainable land management: A decision support system for Kalahari pastoralists. *Journal of Arid Environments*, *74*(1), 149–155. https://doi.org/10.1016/J.JARIDENV.2009.06.016

Roche, D. G., O'Dea, R. E., Kerr, K. A., Rytwinski, T., Schuster, R., Nguyen, V. M., Young, N., Bennett, J. R., & Cooke, S. J. (2022). Closing the knowledge-action gap in conservation with open science. *Conservation Biology*, *36*(3), e13835. https://doi.org/10.1111/COBI.13835

Sanders, M. J., Miller, L., Bhagwat, S. A., & Rogers, A. (2021). Conservation conversations: A typology of barriers to conservation success. *Oryx*, *55*(2), 245–254. https://doi.org/10.1017/S0030605319000012

Saterson, K. A., Christensen, N. L., Jackson, R. B., Kramer, R. A., Pimm, S. L., Smith, M. D., & Wiener, J. B. (2004). Disconnects in Evaluating the Relative Effectiveness of Conservation Strategies. *Biology*, *18*(3), 597–599.

Sawchuk, J. H., Beaudreau, A. H., Tonnes, D., & Fluharty, D. (2015). Using stakeholder engagement to inform endangered species management and improve conservation. *Marine Policy*, *54*, 98–107. https://doi.org/10.1016/J.MARPOL.2014.12.014

Schwartz, M. W., Cook, C. N., Pressey, R. L., Pullin, A. S., Runge, M. C., Salafsky, N., Sutherland, W. J., & Williamson, M. A. (2018). Decision Support Frameworks and Tools for Conservation. *Conservation Letters*, *11*(2), e12385. https://doi.org/10.1111/CONL.12385

Scott, L. A., Leslie, S. C., & Black, S. A. (2021). Differing impact effects of extreme red tide algal blooms on mortality of Florida manatees. *Journal of Aquaculture & Marine Biology*, *10*(5), 237–242. https://doi.org/10.15406/jamb.2021.10.00327

Seddon, J. (2005). *Freedom from Command and Control: A Better Way to Make the Work Work*. Vanguard Education Ltd.

Shackleton, R. T., Adriaens, T., Brundu, G., Dehnen-Schmutz, K., Estévez, R. A., Fried, J., Larson, B. M. H., Liu, S., Marchante, E., Marchante, H., Moshobane, M. C., Novoa, A., Reed, M., & Richardson, D. M. (2019). Stakeholder engagement in the study and management of invasive alien species. *Journal of Environmental Management*, *229*, 88–101. https://doi.org/10.1016/J.JENVMAN.2018.04.044

Sheil, D., & Boissière, M. (2006). Local people may be the best allies in conservation. *Nature 2006 440:7086*, *440*(7086), 868–868. https://doi.org/10.1038/440868d

Silva, L. N., Diederichsen, A., Talbert, L., Leslie, S. C., & Black, S. A. (2022). Insights into Leadership, Gender and Organizational Effectiveness Revealed by Benchmarking Conservation Programmes against the Conservation Excellence Model. *Open Journal of Leadership*, *11*(4), Article 4. https://doi.org/10.4236/ojl.2022.114020

Stephanson, S. L., & Mascia, M. B. (2014). Putting People on the Map through an Approach That Integrates Social Data in Conservation Planning. *Conservation Biology*, *28*(5), 1236–1248. https://doi.org/10.1111/COBI.12357

Sutherland, W. J., Pullin, A. S., Dolman, P. M., & Knight, T. M. (2004). The need for evidence-based conservation. *Trends in Ecology & Evolution*, *19*(6), 305–308. https://doi.org/10.1016/J.TREE.2004.03.018

Tulloch, A. (2015). Using Decision Theory to Select Indicators for Managing Threats to Biodiversity. In D. Lindenmayer, P. Barton, & J. Pierson (Eds.), *Indicators and Surrogates of Biodiversity and Environmental Change* (pp. 45–57). CSIRO Publishing.

Van Weerd, M., Persoon, G., Balderama, O., & Persoon, G. A. (2006). Biodiversity and the natural resource management of coral reefs in Southeast Asia Biodiversity and Natural Resource Management in Insular Southeast Asia Introduction: Insular Southeast Asia. *Island Studies Journal*, *1*(1), 81–108.

Villarreal-Rosas, J., Sonter, L. J., Runting, R. K., López-Cubillos, S., Dade, M. C., Possingham, H. P., & Rhodes, J. R. (2020). Advancing Systematic Conservation Planning for Ecosystem Services. *Trends in Ecology & Evolution*, *35*(12), 1129–1139. https://doi.org/10.1016/J.TREE.2020.08.016

Walther, B. A., Boëte, C., Binot, A., By, Y., Cappelle, J., Carrique-Mas, J., Chou, M., Furey, N., Kim, S., Lajaunie, C., Lek, S., Méral, P., Neang, M., Tan, B. H., Walton, C., & Morand, S. (2016). Biodiversity and health: Lessons and recommendations from an interdisciplinary conference to advise Southeast Asian research, society and policy. *Infection, Genetics and Evolution*, *40*, 29–46. https://doi.org/10.1016/J.MEEGID.2016.02.003

Watts, K., Whytock, R. C., Park, K. J., Fuentes-Montemayor, E., Macgregor, N. A., Duffield, S., & McGowan, P. J. K. (2020). Ecological time lags and the journey towards conservation success. *Nature Ecology & Evolution 2020 4:3*, *4*(3), 304–311. https://doi.org/10.1038/s41559-019-1087-8

Weiss, J. (2009). *The Economics of Climate Change in Southeast Asia: A Regional Review*. Asian Development Bank. http://hdl.handle.net/11540/179

Wheeler, D. J. (2000). *Understanding Variation: The Key to Managing Chaos* (2nd ed.). SPC Press.

Young, J. C., Jordan, A., R. Searle, K., Butler, A., S. Chapman, D., Simmons, P., & Watt, A. D. (2013). Does stakeholder involvement really benefit biodiversity conservation? *Biological Conservation*, *158*, 359–370. https://doi.org/10.1016/J.BIOCON.2012.08.018

Appendix A

Table 4. Profiles of the eight independent assessors assembled for the CEM assessment.

Assessor Code	Geographical Area of Expertise	Description	Designation	Years of Experience
EA-1	International, SE Asia	Conservation planning and project management expert	CEM Lead Assessor	20+
EA-2	International, UK	Conservation planning project management expert, organizational development expert	CEM Lead Assessor	20+
EA-3	Philippines, SE Asia	Conservation planning and project management expert	CEM Lead Assessor	5-10
EA-4	UK, Indian Ocean, Pacific, Caribbean	Species conservation project leader	CEM Assessor	20+
EA-5	Myanmar, SE Asia	Species and landscape conservation project leader	CEM Assessor	10-15
EA-6	SE Asia, Eurasia, Africa	Community conservation project leader	CEM Assessor	10-15
EA-7	USA, Africa	Conservation planning and project management expert	CEM Assessor	0-5
EA-8	Mauritius, Africa	Conservation planning and project management expert	CEM Assessor	5-10

Source: The Authors

Appendix B

Conservation Excellence Model (CEM) descriptors and scoring grid (Black & Groombridge, 2010; Moore et al., 2020) used for the assessment of the 25 conservation programs.

Description of Each CEM criterion used in this study.

Criteria	Sub-criteria
Core Conservation Processes	a. **How core processes are identified:** Which approaches/techniques and why? Is there a scientific/research basis for these choices? b. **How core processes are systematically managed, responsibilities are carried out:** Who is responsible, are resources allocated? How are processes monitored and validated? c. **How core processes are reviewed:** Are there reviews of technical results and management action (adaptive management)? d. **How core processes are improved using innovation & creativity:** Are improvements undertaken including using new scientific knowledge/findings? e. **How processes are changed and evaluated:** Are changes managed carefully, results monitored and evaluated for improvement?
Biodiversity Results	a. **Indicators of response of biodiversity system to conservation activity:** Habitat and population recovery, range, productivity, communities, richness b. **Other measures:** ecosystem function (e.g. water catchment), geophysical (e.g. erosion)
Conservation Program Results	a. **Financial measures of success (income /funding and investment/utilization):** Performance against budget, investments, ratios b. **Non-financial measures:** project related measures, e.g. objectives completed, milestones

Scoring table for the Enable criterion (Core Conservation Processes) as used in the CEM assessment.

Approach	Score	Deployment	Score	Overall (mean)
● **Anecdotal** or non-value adding **SCORE: 0%**		● Little effective usage **SCORE: 0%**		
● **Some evidence** of soundly based approaches **SCORE: 25%**		● Applied to about one quarter of the potential when considering all relevant areas and activities **SCORE: 25%**		

● **Evidence** of soundly based systemic approaches and prevention-based systems ● Subject to **regular checks** against purpose ● **Integration** into normal operations and planning is **well established** **SCORE: 50%**		● Applied to about one half of the potential when considering all relevant areas **SCORE: 50%**		
● **Clear evidence** of soundly based systemic approaches and prevention-based systems ● **Clear evidence of refinement** and improved effectiveness through check/review cycles ● **Good integration** of approach into normal operations and planning **SCORE: 75%**		● Applied to about three quarters of the potential when considering all relevant areas **SCORE: 75%**		
● **Clear evidence** of soundly based systemic approaches and prevention-based systems ● **Clear evidence of refinement** and improved effectiveness through check/review cycles ● **Total integration** of approach into normal operations, planning, and working patterns ● Could be used as a **role model** for other organizations **SCORE: 100%**		● Applied to full potential when considering all relevant areas **SCORE: 100%**		

Scoring table for the Results criteria (Biodiversity Results; Conservation Program Results) as used in the CEM assessment.

Results	**Score**	**Scope**	**Score**	**Overall (mean)**
● Anecdotal **SCORE: 0%**		● Results address few relevant areas and activities **SCORE: 0%**		
● Some results show positive trends and/or satisfactory performance **SCORE: 25%**		● Results address **some** (~1/4) relevant areas and activities **SCORE: 25%**		

• **Many** results show strongly positive trends and/or sustained good performance over at least five cycles (years) **SCORE: 50%**		• Results address **many** (~1/2) relevant areas and activities **SCORE: 50%**		
• **Most** results show strongly positive trends and/or sustained excellent performance over at least ten cycles (years) • Capability of processes appears to be improving • Improvements appear linked to changes made by program **SCORE: 75%**		• Results address **most** (~3/4) relevant areas and activities **SCORE: 75%**		
• **Strongly positive trends** and/or sustained performance in all areas over at least twenty cycles (years) • **Best in class** in many areas of activity • Improvements **clearly linked to changes** implemented by the program • Indications that a sustainable improved position will be maintained **SCORE: 100%**		• Results address all relevant areas and facets of the program **SCORE: 100%**		

Appendix C

Table 5. All the scores submitted by each assessor assigned to each of the 25 programs in SE Asia reviewed in this assessment, ranked from highest to lowest based on scores for Core Conservation Processes.

Case Study	Assessor	Core Conservation Processes	Biodiversity Results	Conservation Programme Results
CEM007	EA-8	83	83	76
	EA-5	76	77	52
	EA-3	72	65	65
CEM006	EA-3	72	67	67
	EA-8	70	75	80
CEM019	EA-3	80	80	75
	EA-5	76	69	79
	EA-7	72	40	69
	EA-1	55	65	65
CEM014	EA-3	65	40	60
	EA-8	60	83	79
CEM026	EA-4	77	65	75
	EA-8	68	57	85
	EA-3	67	33	52
CEM015	EA-3	65	60	67
	EA-4	50	60	67
CEM004	EA-8	72	55	57
	EA-5	70	55	70
	EA-3	65	50	47
CEM005	EA-8	78	83	75
	EA-3	50	60	60
	EA-2	40	29	42
CEM003	EA-8	70	79	77
	EA-5	49	76	77
	EA-3	35	25	25
CEM031	EA-3	77	72	72
	EA-2	60	55	57
	EA-1	30	25	40
CEM010	EA-5	68	65	75
	EA-3	60	60	60
	EA-7	51	68	57
	EA-6	45	25	60
CEM033	EA-3	77	70	65
	EA-5	54	58	61
	EA-1	28	30	35
CEM025	EA-5	70	74	70
	EA-4	60	62	50
	EA-3	40	20	20

CEM016	EA-5	75	60	72
	EA-3	75	15	60
	EA-1	40	25	40
CEM035	EA-8	75	55	84
	EA-5	65	46	57
	EA-3	20	20	30
CEM002	EA-3	67	40	40
	EA-7	45	74	75
	EA-2	35	30	30
CEM034	EA-2	65	67	45
	EA-7	40	31	56
	EA-3	37	32	52
CEM009	EA-5	70	70	77
	EA-2	35	32	20
	EA-3	35	25	27
CEM013	EA-4	62	87	75
	EA-3	40	30	30
	EA-6	20	25	15
CEM028	EA-7	69	50	53
	EA-2	50	40	35
	EA-3	35	15	20
CEM017	EA-6	75	20	25
	EA-3	72	15	35
CEM012	EA-4	62	50	37
	EA-3	45	17	27
CEM001	EA-2	35	50	60
	EA-6	30	32	12
	EA-3	25	47	25
CEM027	EA-6	50	25	35
	EA-1	30	23	48
	EA-3	30	15	17
CEM018	EA-3	30	10	30
	EA-2	25	20	20

Source: The Authors

Appendix D

Study of the variability in scores submitted by each assessor assigned to each of the 25 programs in SE Asia reviewed in this assessment. System Behaviour Charts of CEM scores given by individual assessors across all criteria and all scores show that all scores are within natural limits so show expected variation. No special effects caused by different assessors, different criteria or different cases are presented. The scoring can be deemed as consistent across all assessments (Black et al., 2017; Black & Leslie, 2018; Scott et al., 2021).

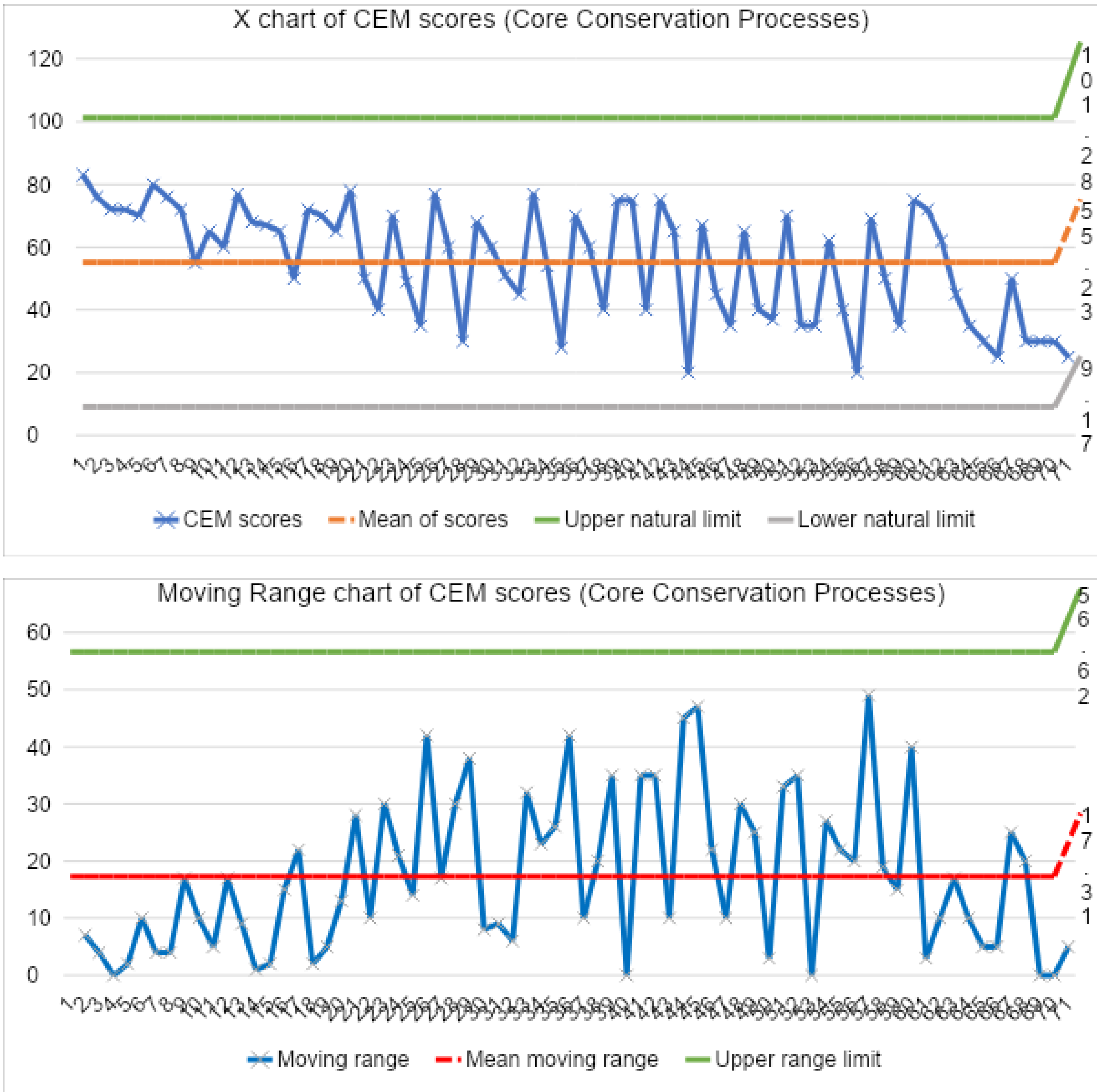


Fig. 4. Mean chart of CEM scores with Upper Natural limit set at Mean + (2.66 x mR) and Lower Upper Natural limit set at Mean - (2.66 x mR) (Wheeler, 2000) and moving range chart with Upper Range limit set at Mean moving Range x 3.27 (Wheeler, 2000).

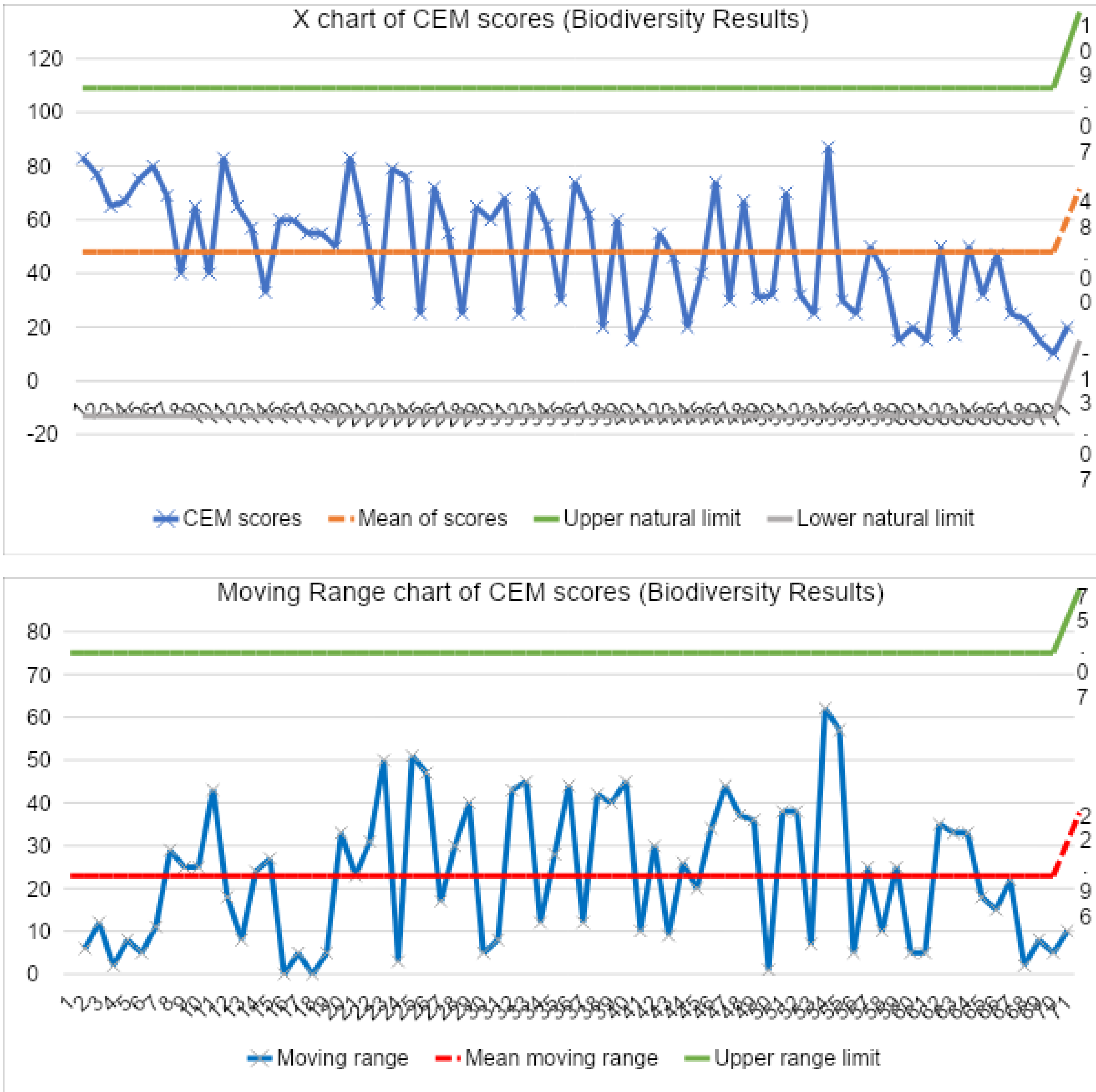
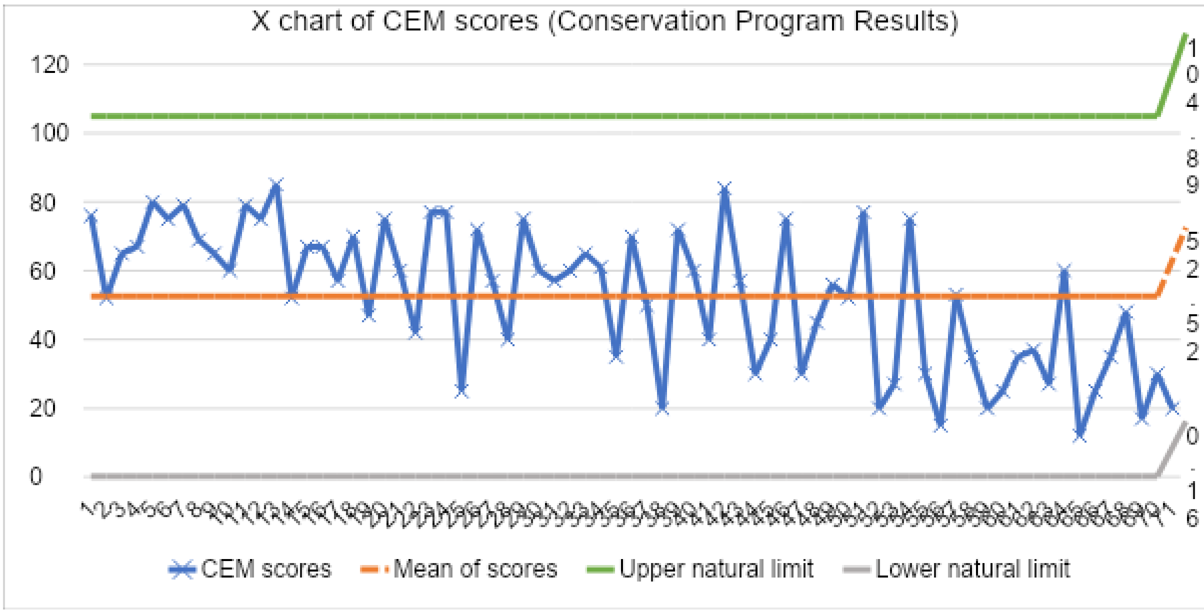


Fig. 5. Mean chart of Biodiversity Results scores with Upper Natural limit set at Mean + (2.66 x mR) and Lower Upper Natural limit set at Mean - (2.66 x mR) (Wheeler, 2000) and moving range chart with Upper Range limit set at Mean moving Range x 3.27 (Wheeler, 2000).



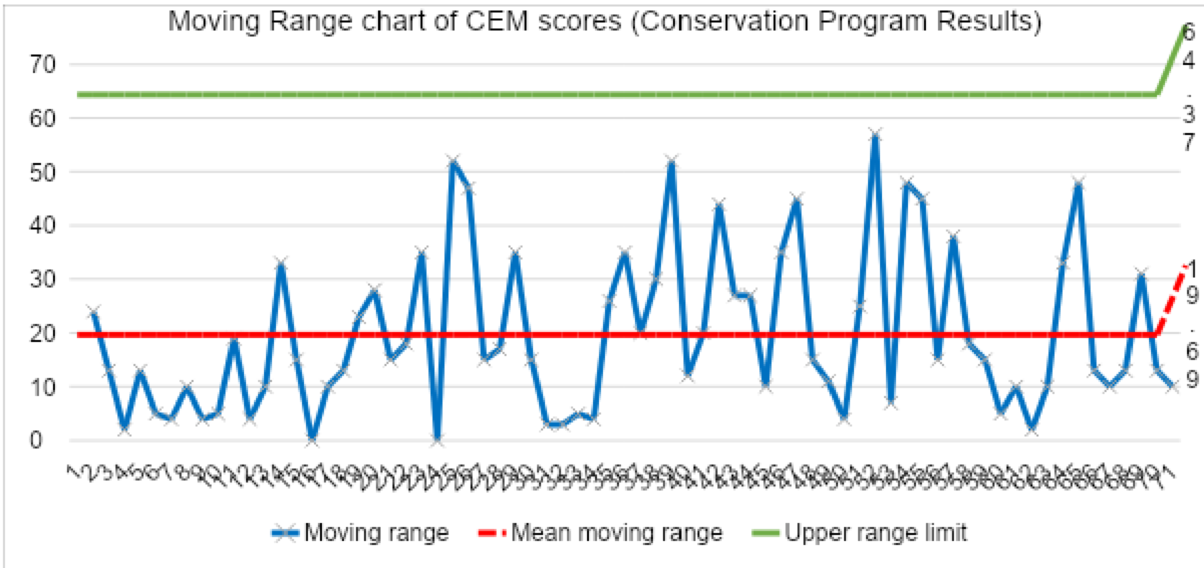


Fig. 6. Mean chart of Conservation Program Results scores with Upper Natural limit set at Mean + (2.66 x mR) and Lower Upper Natural limit set at Mean - (2.66 x mR) (Wheeler, 2000) and moving range chart with Upper Range limit set at Mean moving Range x 3.27 (Wheeler, 2000).