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## Western Indian Ocean Regional Science to Policy Workshop

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# DISCUSSION PAPER ON CUMULATIVE IMPACT ASSESSMENT IN MSP POLICY IMPLICATION FOR WESTERN INDIAN OCEAN

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**UNEP Nairobi Convention, WIO Regional Science to Policy Workshop  
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**Session II: Promoting Linkages between Science and Policy in the WIO region**

**Discussion paper: Cumulative impact assessment in MSP Policy implications for  
Western Indian Ocean**

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*Imagine a reef being slightly disturbed by tourism. It might not be a problem as long as there are no concurrent oil spills, climate change heating and destructive dredge fishing. But if so be, then an additional fish farm would be better localized off the edge of the nearby reef where the currents reduce ocean heating and fishing is undertaken by more benevolent methods. So, in the marine spatial plan we indicate that the second area is more appropriate for fish farming.*

*Such reasoning may be trivial in one delimited case. But when similar assessments should be conducted for a larger region with tens of options and hundreds of underlying variables, then we need computational support. Such decision support must be both transparent and scientific.*

**Rationale**

Strategic spatial planning requires a holistic approach. Across the world, marine spatial planning (MSP) is increasingly recognized as an important instrument for cross-sectorial marine management and policy. MSP promotes growth of the blue economy by increasing predictability and providing institutional support for long-term investments. Simultaneously, MSP facilitates the sustainable utilization of marine space and resources that is required in our time of global marine ecosystem degradation. Ecosystem-based MSP has the potential to combine the interests of prosperous growth and environmental regeneration from coast to sea (Ehler *et al* 2009).

For planners and stakeholders to integrate environmental considerations in MSP processes we need the capacity to assess all environmental impact at once. That is, to understand how all various human activities may affect all prevalent ecosystem values, across vast spaces and despite insufficient data.

**Method**



At strategic level, such assessments are possible using the method for cumulative impact assessment (CIA), presented by Halpern *et al* 2008. This basic method provides a transparent and simple way of combining data of pressures from human activities (maps) with data of ecological values (maps) through an index that describe how sensitive each ecological value is to each pressure. Multiplying the normalized values of these three components, in all combinations, generates impact scores for every pixel in the map. This impact map shows which areas are heavily impacted and which are relatively pristine. The results also indicate how much different human activities contribute to the cumulative impact.

Moreover, by building development scenarios of future human activities we can make projections of future impact, across space and time. This enables holistic assessments of cumulative impact from MSP and other marine policy. Although uncertainties are large and results only informative at strategic level, this method can be a strong support to planners and stakeholders in any MSP process.

Sweden is currently in the last stage of MSP development and late drafts where published in 2019 (SwAM 2019). During the planning process, we have developed and used a CIA tool, *Symphony*, for the continuous assessment of how different planning alternatives may affect environment (SwAM 2018).

### **Results and policy implications**

With the integration of this decision support tool, we have been able to identify areas where certain activities should give way to environmental precaution, and other areas where new activities can be localized without endangering ecosystems. The Swedish CIA results show how MSP significantly reduces environmental impact in some regions, even if we increase the utilization of some natural resources. In other certain areas, it seems that the planning has small mitigating effect, because environmental impact in those areas stem from background pressures hardly affected by MSP (such as eutrophication and climate change). Swedish MSP even increases environmental impact at some places, because prioritization of industrial development despite ecological values. In most cases, however, CIA has contributed to an informed weighting between interests and environment and facilitated for planners to make considerate trade-offs.

In particular, CIA has helped Swedish planners and stakeholders to compress huge amounts of information into comprehensible illustrations, thus guiding the appropriate localization of activities and distinguish between what's "small" and what's "large" from environmental perspective. In essence, the CIA method has proved a strong support to ecosystem-based MSP.



## **Opportunities and benefits of CIA in the region**

The same CIA method can be used anywhere there is data available (Korpinen & Andersen 2016). Since open data sources have global coverage for many human activities and broad ecosystem categories, CIA has the potential across the globe. The more accurate data, the better and more reliable analyses. By combining existing local data with open source global data, the method has value for strategic assessments in most areas. Rough estimates of current cumulative impacts exist for all parts of the global ocean and work as informative examples (Halpern *et al* 2015, WCMC 2019). For instance, the analyses shows that European and east Asian seas has the highest environmental impact, but also that impact is growing most rapidly in equatorial regions including the Western Indian Ocean. Much of this growing impact is due to accelerating climate change, but also due to human activities at sea and along the coast.

In the light of increased MSP-activities in the Western Indian Ocean, there might be good reasons to look into the opportunities for initiating a regional CIA. Data availability will affect quality of such effort, but even global data from open archives can provide a start from which national data sets will add quality where available. By developing a CIA tool that allows for scenario analyses, national MSP processes can utilize a common ground of data and analytic framework for their respective planning processes, meanwhile cross-boundary issues will have a platform for assessment and dialogue.

Because of its transparency, comprehensibility and analytic power CIA may be a valuable support to planners, stakeholders and policy makers across the region. Ultimately, the CIA is a simple and transparent instrument for integrating science with policy.

## **Recommendations**

### **Technical recommendations:**

1. The Secretariat is requested to work with partners in building capacity in Cumulative Impact Assessment (CIA) in relation to MSP for key/mandated government institutions and partners in the region
2. The Secretariat is requested to work with partners in conducting CIA for the region and at national level for countries which may express interest as appropriate

### **Policy recommendations**

1. The Contracting Parties are urged to integrate CIAs in ecosystem-based MSP at both policy level and during implementation

## **Key references**



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