

Enabling local blue growth in developing countries



A thematic review



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**Havs
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myndigheten**

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Preface

This report is a result of *SwAM Ocean*, an international development cooperation programme being operated by the Swedish Agency for Marine and Water Management (SwAM). *SwAM Ocean* aims to contribute to poverty reduction through sustainable use of aquatic resources. To reach this goal we need a good understanding of the premises for enabling long-term blue growth in coastal communities. This report is part of a four-part series of studies of the topic.

As part of *SwAM Ocean*, four studies exploring the conditions for lifting coastal communities out of poverty are being conducted. These four studies investigate institutional and infrastructure factors affecting blue growth and social development at local level in developing countries.

The first study (WSP, 2020) analyses 17 cases of successful blue growth at community level, based on small-scale fisheries, aquaculture and conservation. The study is based on a literature review and expert interviews. It identifies co-management of natural resources, access to credit, technical skills, well-functioning post-harvest value chains and the presence of infrastructure such as fishing ports, docking and storage as being key to enabling local blue growth.

In the second study a thematic review of scientific literature is conducted, and is presented in this report. Results of the review indicate that local blue growth is more likely in the presence of coherent and predictable blue-economy frameworks, and when stakeholders have adequate capacity and skills. National and international institutions and actors need to adapt blue-economy projects and policies to local contexts, support the development of well-functioning value chains and ensure that efficient environmental regulations are enforced.

A spatial analysis exploring how basic infrastructure affects blue growth and socioeconomic development is presented in the third study (GroundTruth, 2021). It explores 11 rural coastal communities in the Western Indian Ocean region, and concludes that the presence of and access to roads, airports and electricity in coastal communities contribute to economic wellbeing. The key role played by strategic planning is also highlighted, indicating that strategically planned communities tend to feature higher levels of both economic and social wellbeing.

The fourth study explores lessons learned from promotion of local blue growth in coastal communities in Sweden. Applying a case-study approach, it identifies enablers and barriers, along with strategies used for overcoming them, resulting in successful project outcomes.

SwAM is the responsible Swedish government agency tasked with protecting, restoring and ensuring sustainable use of freshwater and ocean resources, including fisheries management. The work being carried out within the international development cooperation programme *SwAM Ocean* contributes to holistic marine management, blue growth and poverty alleviation in partner countries and regions. In parallel, knowledge gained from the *SwAM Ocean* collaboration enhances and improves our own understanding and management of Swedish aquatic resources. Ecosystem-based management, ocean literacy and cross-sectoral planning, including marine

spatial planning, are examples of processes in which mutual learning is key in order to achieve sustainable management of the oceans in Sweden and at international level.

This study has been conducted by Maria Göthberg, Linus Hammar, Gonçalo Carneiro, Ylva Mattsson and Marie-Laure Sundman at the Swedish Agency for Marine and Water Management.

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Summary

Blue growth – the prospect of economic revenue and wellbeing from the sustainable use of ocean resources – has caught the interest of most coastal and island nations of the world, including many developing countries. The sea alone does not, however, spur socioeconomic development in coastal communities. A large body of scientific literature explores the circumstances under which a community’s access to natural resources actually leads to local economic growth. This study specifically examines the literature targeting the communal-level outcome of aquatic resource use in developing countries, with a focus on identifying the prerequisites for socioeconomic wellbeing resulting from the exploitation of such resources.

More specifically, this study strives to identify the institutional and infrastructure factors that promote local blue growth in developing countries. It consists of a thematic review of 90 scientific articles involving systematic mapping, regression analysis and content analysis.

The study concludes that the incomes and wellbeing of coastal communities in developing countries depend on well-functioning value chains and the degree of social development. The results also show that the sustainability of marine and coastal resources is associated with the quality of resource management, the degree of coherence of policy and legal frameworks and the manner in which they are communicated. Inadequate resource management and incoherent policies and laws, on the other hand, are associated with lower incomes, wealth and employment.

The study identifies a number of critical factors related to the type and quality of governance. Blue growth at local level benefits from governance frameworks that are coherent and reliable, leadership that is dynamic and legitimate, an administration that is reliable and enforcement that is efficient. It is also of great importance that decisions affecting the livelihoods of coastal communities be adapted to the local circumstances and that communities be given adequate opportunity to influence those decisions. Coastal-community development depends on the degree of social cohesion and equity in access to resources, as well as on the capacity of individuals and organisations. Such capacity is important not only in the private sphere for the development of sustainable blue businesses, but also in the public sphere for the design and implementation of public policies that are evidence-based and adapted to context. A further conclusion of this study is that local blue growth benefits from the existence of well-functioning value chains, markets that are open and accessible, and infrastructure that is adequate and well maintained.

Based on these results, the study proposes the following eight recommendations for consideration by authorities and development agents working for local blue growth. These recommendations are further elaborated in Chapter 6.

1. Ensure that legal frameworks and policies affecting the blue economy are coherent, clear and predictable.
2. Support the development of well-functioning value chains for blue economy products and services.

3. Support the creation and development of organisations for blue growth in the local community.
4. Appreciate the importance of high-quality leadership.
5. Engage local communities in decisions affecting their blue economy.
6. Enhance the capacity and technical skills of individuals and institutions of the blue economy.
7. Provide and maintain the infrastructure necessary for local blue growth.
8. Build local blue growth using the whole toolbox – the above recommendations for advancement of local blue growth should not be viewed in isolation but addressed simultaneously.

Sammanfattning

Blå tillväxt – alltså att säkra ekonomiska intäkter och skapa socialt välbefinnande från ett hållbart användande av havets resurser – har väckt intresse hos många kust- och önationer runt om i världen, inklusive många utvecklingsländer. Närheten till ett innehållsrikt hav resulterar dock inte automatiskt i socioekonomisk utveckling i kustsamhällen. Det finns en stor mängd vetenskaplig litteratur som undersöker under vilka förhållanden ett samhälles tillgång till naturresurser faktiskt leder till lokal ekonomisk tillväxt. Denna studie är en närmare genomgång av den litteratur som specifikt studerar lokal blå tillväxt i utvecklingsländer. Studiens syfte är att identifiera under vilka förutsättningar ett lokalt användande av havets resurser leder till ökade inkomster och socioekonomiskt välbefinnande på lokal nivå.

Mer specifikt strävar denna studie efter att kartlägga den infrastruktur och de institutionella faktorer som främjar lokal blå tillväxt i utvecklingsländer. Studien är en tematisk granskning av 90 vetenskapliga artiklar, vilket omfattar systematisk kartläggning, regressionsanalys och textanalys.

Studien drar slutsatsen att ökade inkomster och socialt välbefinnande i utvecklingsländers kustsamhällen beror på tillgången till välfungerande värdekedjor och nivån av social utveckling. Resultaten visar också att de marina resursernas hållbarhet är avhängt kvaliteten i naturresursförvaltningen, graden av samstämmighet i politik och juridiska ramverk, och hur innehållet och betydelsen av dessa regelverk kommuniceras. Vidare visar studien hur en bristande naturresursförvaltning och oförenlighet mellan politik och juridik relaterar till lägre tillgångar och inkomster, samt en minskad sysselsättning.

Studien identifierar även ett antal avgörande faktorer inom samhällsstyrningens typ och kvalitet med påverkan på den lokala blå tillväxten. Lokal blå tillväxt gynnas av samhällsstyrning som är samstämmig och tillförlitlig, av ledarskap som är dynamiskt och legitimt, och av en fungerande och effektiv administration. Det är också av stor vikt att de beslut som påverkar kustsamhällenas försörjning och sysselsättning anpassas till de lokala förhållandena, och att samhällena ges tillräcklig möjlighet att påverka dessa beslut. Kustsamhällens sociala utveckling beror på graden av social sammanhållning och en rättvis tillgång till marina resurser, samt individers och organisationers kapacitet och kunskap. En hög kapacitet är inte bara viktig inom den privata sektorn för att utveckla hållbara blå företag, utan också inom den offentliga sektorn för att utforma och genomföra en politik som är evidensbaserad och kontextanpassad. Lokal blå tillväxt gynnas även av förekomsten av välfungerande värdekedjor, öppna och tillgängliga marknader samt infrastruktur som underhålls och utvecklas.

Baserat på dessa resultat följer åtta rekommendationer som riktar sig till både myndigheter och andra utvecklingsaktörer som arbetar för lokal blå tillväxt. Dessa rekommendationer beskrivs mer utförligt i kapitel 6.

1. Säkerställ att juridiska ramverk och politik som påverkar den blå ekonomin är sammanhängande, tydliga och förutsägbara.

2. Gynna utvecklingen av välfungerande värdekedjor för produkter och tjänster inom den blå ekonomin.
3. Stöd etablerandet och utvecklingen av organisationer som verkar för blå tillväxt i lokalsamhällen.
4. Värdesätt betydelsen av ledarskap av hög kvalitet.
5. Involvera lokala samhällen i beslut som påverkar deras blå ekonomi.
6. Stärk kapacitet och tekniska kompetens hos individer och institutioner som verkar i den blå ekonomin.
7. Tillhandahåll och underhåll den infrastruktur som är nödvändig för lokal blå tillväxt.
8. Bygg lokal blå tillväxt med hjälp av hela verktygslådan – ovanstående rekommendationer behöver hanteras samtidigt för att skapa en gynnsam grogrund för lokal blå tillväxt.

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Appendix 1 – Methodology 58

1 Introduction

Oceans and coasts possess abundant natural resources. Income and socioeconomic development in most coastal communities rely on the harvesting of marine resources and the use of other coastal and marine ecosystem services. Yet many coastal areas remain poor and underdeveloped, especially in developing countries, in spite of economic activities such as fisheries, aquaculture and tourism.

Raising the living standards of many coastal communities that depend on coastal and marine resources is a political priority in many societies. Locally sustained revenue from these resources is therefore key to marine management and policy.

A large body of scientific literature explores the linkages between access to natural resources and local economic development. Part of this literature specifically looks at marine and coastal resources and local blue growth. This is the subject of this study, namely the conditions underpinning the development of coastal communities in developing countries through the use of coastal and marine resources.

2 Aim of study

The aim of this study is to improve the understanding of how to promote local socioeconomic growth through the utilisation of coastal and marine resources in developing countries, with a particular focus on the role of institutions and infrastructure.

The study provides recommendations related to the use and management of aquatic resources with the aim of spurring sustainable development and raising living standards in coastal communities.

3 Methodology

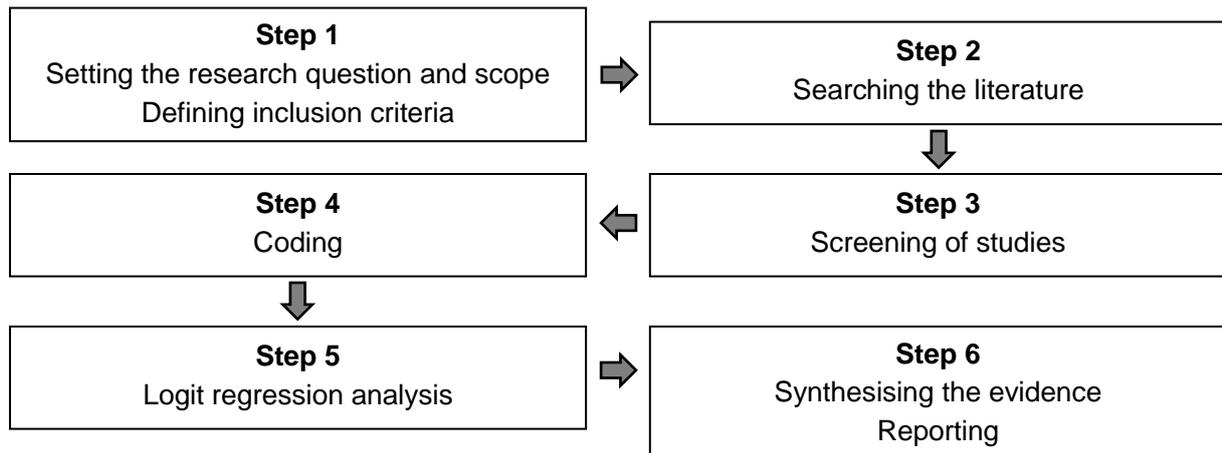
This study is a thematic synthesis combining elements of systematic mapping and scoping review methodologies as employed by Carneiro et al (2019), complemented by a logit regression analysis. The study was conducted between July 2019 and March 2021, in accordance with the sequence of steps depicted in Figure 1.

The research question guiding the study is:

What are the key institutional and infrastructure factors that promote local blue growth deriving from the use of marine resources in developing countries?

The review included papers published in peer-reviewed scientific journals. A search was conducted on the public scientific database Clarivate® Web of Science using search terms

encompassing the thematic scope of the study. Predetermined inclusion criteria derived from the research question were then used for the screening of paper titles and abstracts. A final set of papers meeting the inclusion criteria was coded using a standardised manual-coding procedure assisted by ATLAS.ti Qualitative Data Analysis software. Coded passages were stored for later analysis, and the elements necessary for the mapping of the literature were retrieved and inputted into a Microsoft Excel worksheet.



Logistic (Logit) regression (Walsh, 1987) was applied to the outcomes of the coding, to identify statistical correlations between factors and outcomes. The results provided the basis for the synthesis and the reporting step by identifying the ‘factor outcome’ pairs with a statistically significant correlation. The last step of the study involved analysing the findings relative to each of these ‘factor outcome’ pairs, synthesising the mechanisms through which factors affect outcomes, and producing the literature map and thematic synthesis that make up this report.

Appendix 1 includes a full description of the methodology.

3.1 Limitations of the method

The method used in this study has limitations that affect the validity of the study results. The first one has to do with the sample, and primarily affected the external validity of the results. The sample only includes studies published in the peer-reviewed scientific literature in a few selected languages. There is undoubtedly a very large number of other experiences of local blue growth that are not reported in that literature and therefore not represented in this study.

Another important limitation affecting the internal validity stems from the risk of subjective bias in the coding of the documents. Despite the adoption of common methodological guidelines and definitions of key terms, and despite implementation of procedures to address inter-coder discrepancies, the risk of subjective bias in the coding cannot be eliminated entirely. A potential negative consequence is that relevant text passages might not have been coded and are thus not included in the analysis.

The final limitation relates to the logit regression analysis. Quantitative analyses of variable data with many factors require large data sets. In the sample used in this study, few drivers were frequent enough to generate significant findings, and the results are likely to be biased towards the sectors most common in the literature covered. This type of quantitative analysis of qualitative material also removes information in the process of quantification. It is thus likely that the findings presented here are not only affected by uncertainty but also only represent a fraction of all the causal relations discussed in the literature.

4 Results

4.1 Mapping of reviewed literature on local blue growth

This chapter presents a map of the literature reviewed in this study, based on descriptive statistics. This includes the number of publications included in the synthesis, the geographical distribution of the studies reported in those publications, the year of publication and the main sector addressed in each study.

Table 1 shows the number of studies retained after each of the Search, Screening and Review steps described in the previous chapter. The map presented in this section is based on information from the 90 studies that were coded.

Screening steps	Number of papers retained
Literature search	1,002
<i>1st screening: Title</i>	250
<i>2nd screening: Abstract</i>	98 (accepted for full text review)
<i>3rd screening: Papers 'in doubt'</i>	43
<i>Full text coding and analysis</i>	122
Coded and included in synthesis	90

Table 1 – Number of papers retained after each screening step

Figure 2 and Figure 3 show the geographical distribution of the studies.¹ South-eastern Asia, Southern Asia and Eastern Africa are the three regions for which there are the most studies: 26, 18 and 13, respectively. There are 11 studies that involve two or more countries, and seven studies focusing on countries in Southern Africa. For all other regions there are five studies or fewer.

The Philippines is the country for which there are the most studies. Of the ten studies focusing on this country, half deal with small-scale marine fisheries. There are nine studies for Bangladesh and nine for Indonesia, but whereas in the former case inland fisheries and aquaculture each

¹ This study adopts the classification of geographical regions of the Statistics Division of the United Nations Secretariat, available at <https://unstats.un.org/unsd/methodology/m49/> (last accessed on 4 June 2021).

represent a third of the total, in Indonesia nearly half is made up of small-scale marine fisheries studies, the remainder comprising aquaculture, tourism, environmental conservation and offshore energy production. This latter study is the only one in this sector in the entire sample. With respectively seven, six and five studies, India, South Africa and Tanzania close the group of countries for which there are five or more studies.

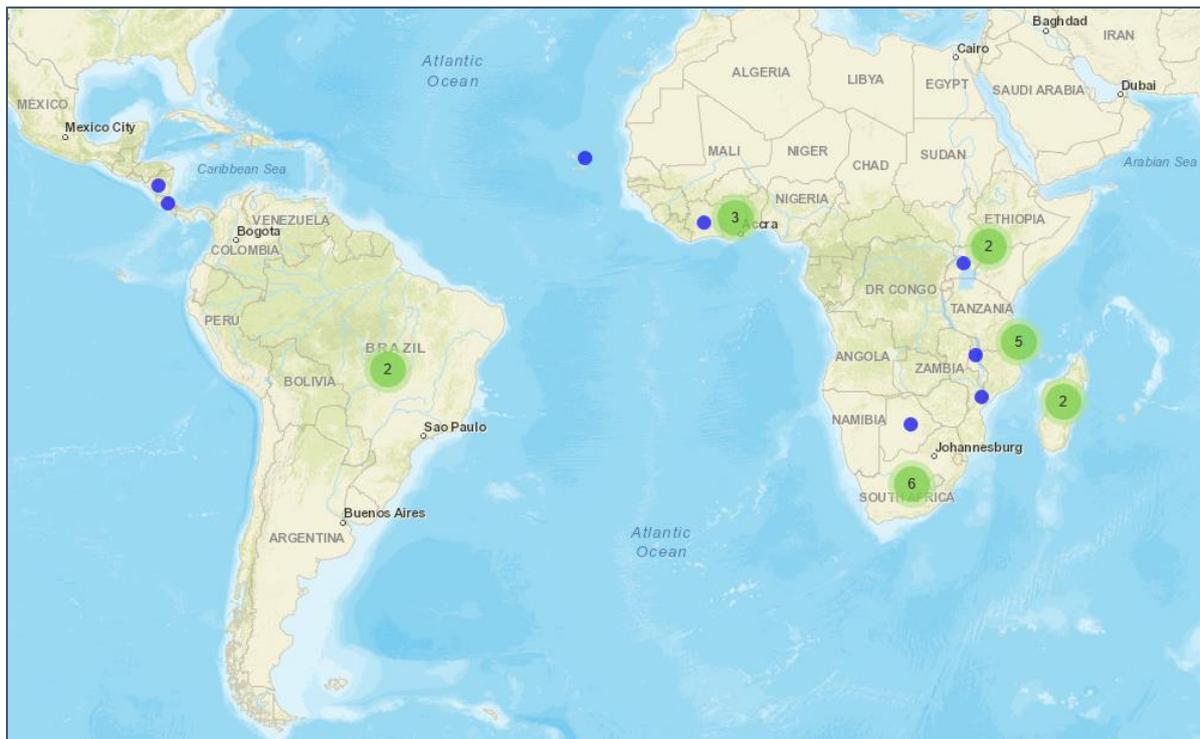


Figure 2 – Geographical distribution of studies, America and Africa. Blue dots represent one study in a given country, and green dots two to nine studies. The 11 studies involving multiple countries are not indicated on the map. Map created with EviAtlas web application, <https://estech.shinyapps.io/eviatlas/>.

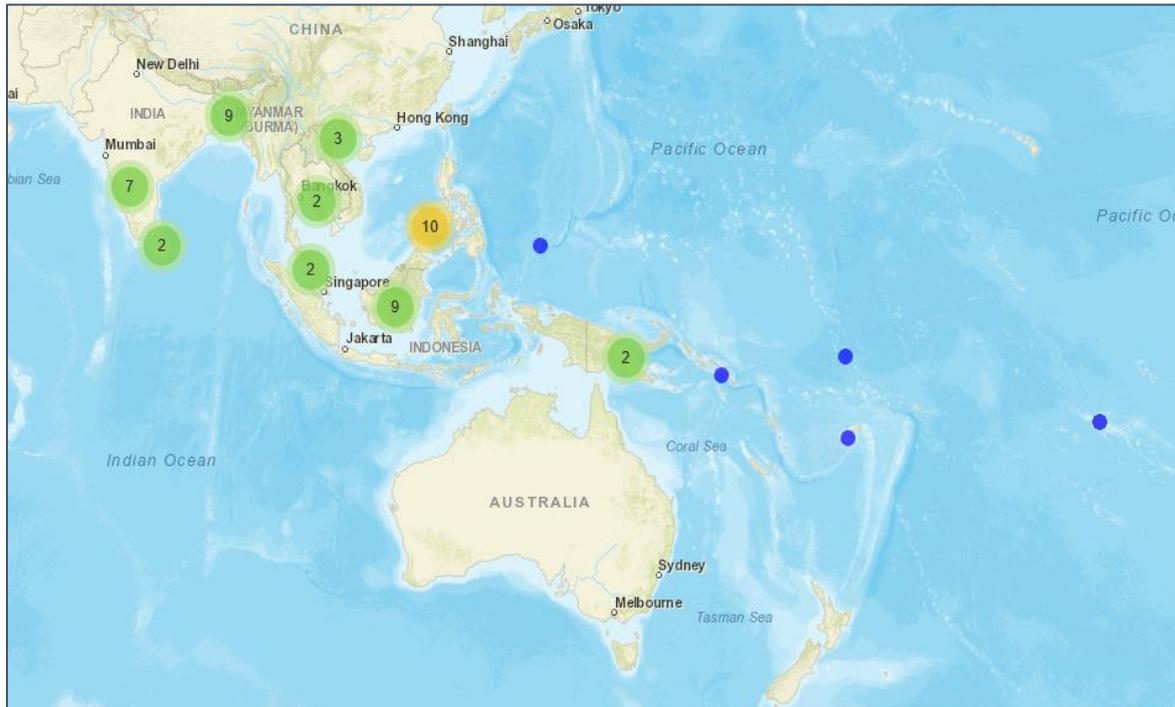


Figure 3 – Geographical distribution of studies, Asia and Pacific. Blue dots represent one study in a given country, green dots two to nine studies and yellow dots 10 or more studies. The 11 studies involving multiple countries are not indicated on the map. Map created with EviAtlas web application, <https://estech.shinyapps.io/eviatlas/>.

With the exception of two studies published in the late 1990s, all of the 90 publications included in this synthesis were published after 2006, as depicted in Figure 4. 2017 and 2018 stand out as the years with the most studies: 20 and 19 respectively. Despite significant interannual variations, there is an increase with time in the number of publications addressing the topics of this review.

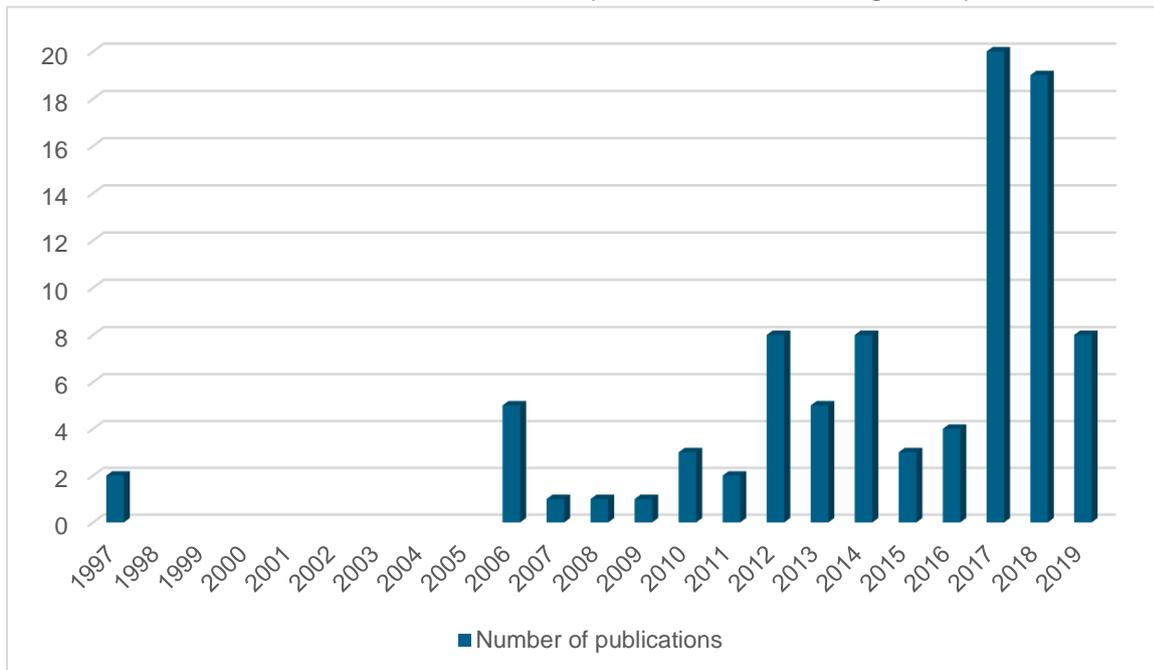


Figure 4 – Distribution of number of publications by date of publication

Figure 5 shows the distribution of the number of studies by main sector of study. Most of the studies only deal with one sector. In the few studies that address more than one sector, only the main sector was considered for this statistic. Small-scale marine fisheries and marine fisheries together make up 45 percent of the publications, followed by aquaculture with 27 percent, inland fisheries with 13 percent and tourism with 10 percent. The sample includes four studies of environmental conservation and one study of offshore energy production.

The distribution of the number of studies according to sector and region is depicted in Figure 6. The preponderance of studies from South-eastern and Southern Asia, as well as from Eastern Africa, as referred to above, is clearly visible. However, no pattern is discernible relative to differences in how the various sectors are dealt with in the different regions.

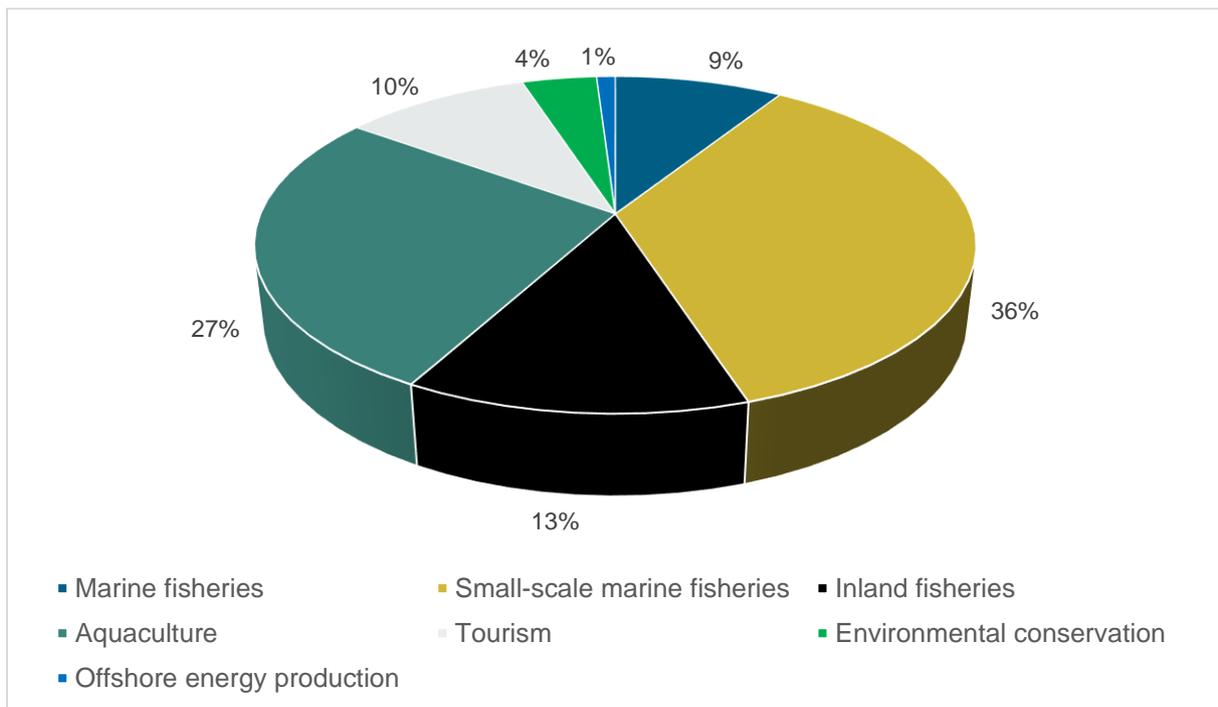


Figure 5 – Distribution of studies by main sector

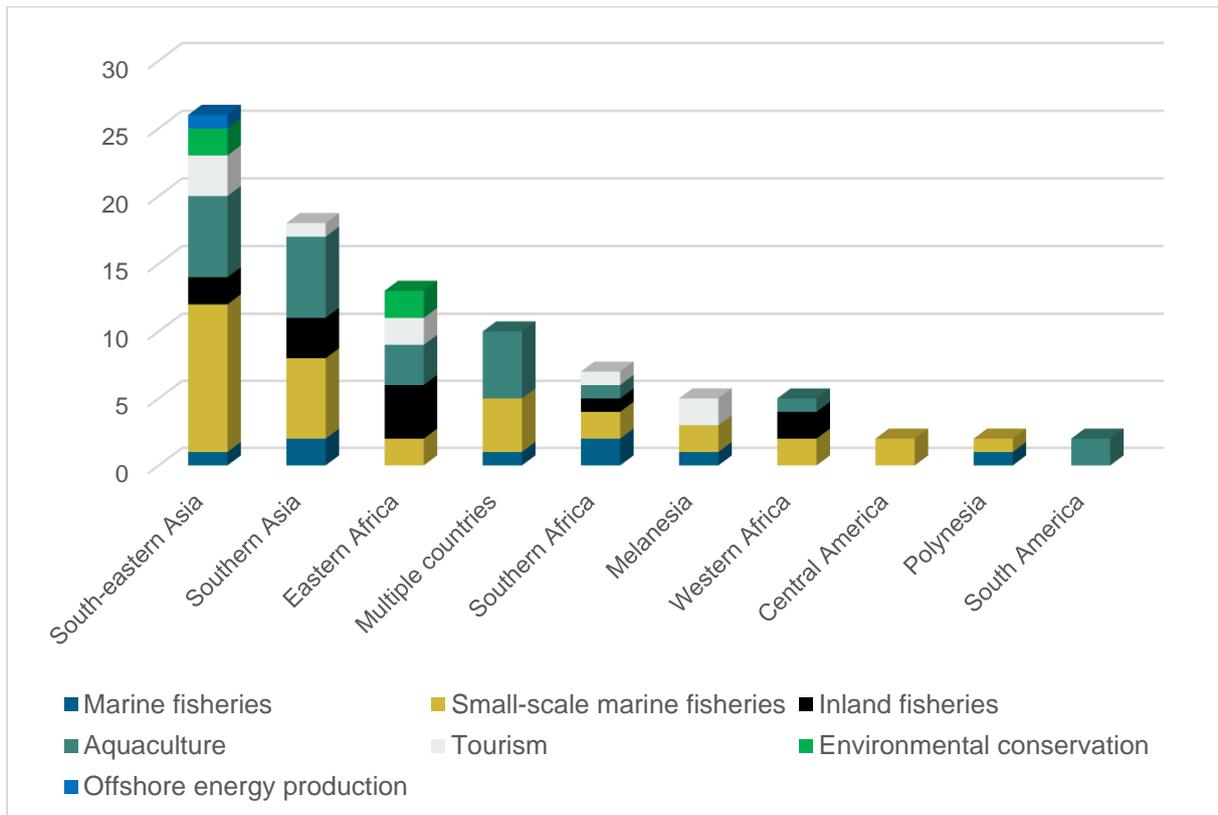


Figure 6 – Distribution of studies by region and sector

4.2 Logit regression analysis

The logit regression provided the basis for the subsequent qualitative text analysis by identifying possible statistical correlations between drivers of economic wellbeing, infrastructure and institutional factors.

4.2.1 Sector-generic findings from the quantitative analysis

Table 2 shows the results from logistic regression analyses². It was found that infrastructure and institutional factors significantly correlated with the outcome of four drivers of economic wellbeing: income and wealth, employment, economic diversity and sustainability.

According to the results, income and wealth are more likely to grow in the presence of *value chains, post-harvest, and trade*, as well as *social development, education and training*. These are important factors with a very high likelihood of contributing to economic development from the use of marine resources. Moreover, the analysis provides indirect evidence for the importance of *policy coherence, institutional coordination and collaboration* as well as *good resource*

² The two sector categories *exploitation of minerals* and *maritime transportation and ports* occurred in fewer than five cases and were consequently disregarded.

management. Cases where these factors are absent are more likely to fail in terms of economic development.

It was also found that employment and economic diversity are less likely to develop in the absence of *policy coherence*, *institutional coordination* and *collaboration*.

Sustainability, which in the longer term may be underpinning most drivers for economic wellbeing, was found to have a strong positive correlation with good *resource management*. It was also shown that a lack of *policy coherence*, *institutional coordination* and *collaboration* as well as *information*, *research* and *communication* reduces the likelihood of attaining sustainability.

Sector	Driver of well being	N	Factors included	H-L p-value	Correlating factors	Correlation	Factor p-value	Odds ratio (probability)	Interpretation
All	Income & wealth	197	14	0.981	Value chains... (code 3.05)	Presence → positive	0.002	29 (0.97)	A
					Social development... (code 3.03)	Presence → positive	0.004	24 (0.96)	A
					Policy coherence... (code 3.08)	Absence → negative	0.002	0	B
					Resource management... (code 3.02)	Absence → negative	0.005	0	B
All	Employment	59	8	1.000	Policy coherence... (code 3.08)	Absence → negative	0.018	0	B
All	Economic diversity	73	9	1.000	Policy coherence... (code 3.08)	Absence → negative	0.033	0	B
All	Sustainability	87	9	0.804	Resource management... (code 3.02)	Presence → positive	0.007	11 (0.92)	A
					Policy coherence... (code 3.08)	Absence → negative	0.010	0	B
					Information... (code 3.09)	Absence → negative	0.027	0	B
Small fisheries	Income & wealth	74	9	1.00	Policy coherence... (code 3.08)	Absence → negative	0.023	0	B
					Social development... (code 3.03)	Absence → negative	0.044	0	B

Table 2 – Results of the logit regression analysis. Only significant correlations are shown. Full factor names are indicated by code number (see Appendix 1, Table 3). Interpretation A means that the presence of the factor increases the probability of the driver (direct evidence of factor importance), whilst interpretation B indicates that a lack of the factor reduces the chance of the driver (indirect evidence of factor importance).

4.2.2 Sector-specific findings from the quantitative analysis

When logit regression was applied to single sectors, only the effect on income and wealth from small-scale fisheries generated significant results (probably owing to the reduced sample sizes for individual sectors in the literature reviewed). This single-sector analysis showed that an absence of *policy coherence, institutional coordination and collaboration* as well as of *social development, education and training* correlates negatively with the probability of high income and wealth for small-scale fisheries. This is thus indirect evidence of factor importance.

4.3 Text analysis

4.3.1 Organisations, networks and the community level

Many studies emphasise the important role of local capacity, organisation and networks of community actors for achieving local blue growth. Local blue growth is described in terms of higher incomes from fisheries, aquaculture, environmental conservation and tourism. Some examples also point to positive effects on employment and in terms of adopting more environmentally sustainable management practices.

The key mechanisms for enabling local capacity and organization and local blue growth were grouped into four categories: leadership, shared norms and values, importance of administration, and technical training and capacity building for blue businesses. Figure 7 shows the distribution of articles used in this chapter by geographical region and sector.

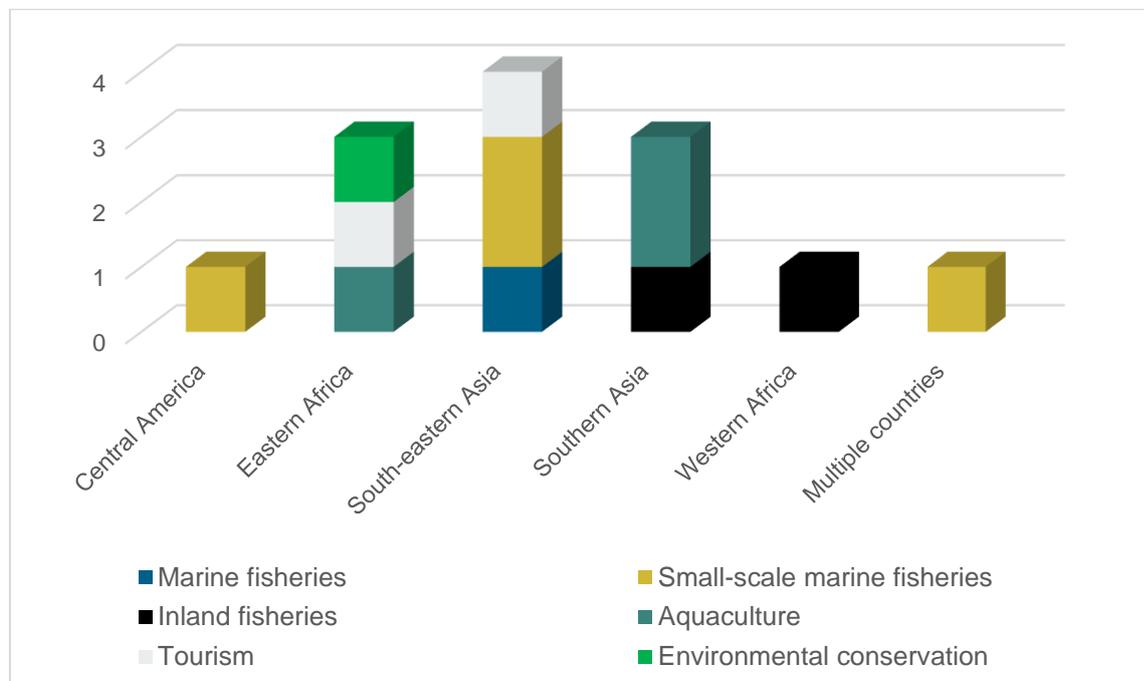


Figure 7 – Distribution of the studies supporting Chapter 4.3.1 by sector and region

Leadership

The importance of leadership is accounted for in a number of studies, including cases from Bangladesh (Pant et al, 2014), Indonesia (Stanford et al, 2014; Yamazaki et al, 2018), Kenya (Kawaka et al, 2017), Costa Rica (Rivera et al, 2017) and multiple developing countries (Kosamu, 2015). Good leadership is often described in terms of an individual or a function at an organisation having expertise and knowledge about the local context, being proactive and having the necessary networking skills for the benefit of the local community. Good leadership also needs to be considered legitimate, and to have the ability to mobilise and energise the group being led.

In a case study from the north and northwest of Bangladesh dynamic leadership and a strong group approach were pointed out as being key to success in the Adivasi Fisheries Project among resource-poor and landless Adivasi communities (Pant et al, 2014). Given the strong community-leadership system prevalent among Adivasi communities, those groups who had leaders supportive of technological interventions and community mobilisation enjoyed an increasing household income from businesses such as pond netting and fingerling and food-fish trading. The frequency of fish, meat and egg consumption also increased, contributing to improved food and nutrition security. Contrastingly, aquaculture expansion and the profitability of the sectors was limited in areas where community leaders were more passive in their encouragement and mobilisation of their communities.

Examples from small-scale fisheries in Indonesia and Malawi showcase how leaders acting as a bridge between government and the community have improved access to otherwise inaccessible resources and information (Stanford et al, 2014; Kosamu, 2015; Yamazaki et al, 2018). In Malawi trust in leadership and strong social cohesion were the main institutional pillars of the community-based management arrangement at Lake Chiuta Fishery, leading to sustainable expansion of the fish catch in the 1990s. In Kenya leadership along with education, awareness and training, supporting legal frameworks and external sources of funding were identified as key factors for successful establishment of locally managed marine areas which both protect environmental resources and support local livelihoods (Kawaka et al, 2017).

Leadership also needs to be legitimate. In a case study of a fishing cooperative in Costa Rica the discussion of leadership was less about describing individual leaders' capacity than about the leadership role (Rivera et al, 2017). The study explores an organisational model in which fishers practice their livelihood individually but share the company and the market as a group. This is described as a 'learning through action' experience. Rivera et al (2017) learn how leadership roles have been shared and are recurrent, and respondents say this has upheld the cooperative's representative legitimacy. Led directly by fishers, the organisation has adapted the cooperative model to fit their way of life, which is based on culture and community economy. In such a context, a leader must not necessarily originate from, or be a part of, the community being led. This is also showcased in a comparative study from Indonesia, which discusses the role of leadership in the three fishing communities of Sungai Nipah, Tiku Selantan and Air Manis (Stanford et al, 2014). Leaders of the three groups were recruited from both within and outside the communities. However, whether a person earned a high degree of trust from community

members depended not on that person's origin but on whether they were really committed to their tasks and actually helped the group move forward.

The literature also includes several examples of the detrimental effects of poor leadership. In the case of Air Manis in Indonesia, group members of a fishing community have partially lost faith in the future of the group altogether, owing to poor leadership. "There isn't a group any more if the members don't trust the leader," as one respondent summarised (Stanford et al, 2014, p. 23). Other studies from Bangladesh and Indonesia show that allowing groups to expand too quickly has led to a breakdown of trust and a decrease in income in community-based fisheries (Kosamu, 2015) and aquaculture projects (Pant et al, 2014).

Social capital and shared visions

Another mechanism through which community organisations positively affect local blue growth is shared norms and visions. The latter allow a community to come together and jointly work towards a vision of the future. This mechanism is also intertwined with successful leadership in the form of someone capable bringing individuals together and convincing them they are better off working as a group than individually. Shared norms and visions have been proven to unite a group, in turn contributing to increased collaboration (Islam et al, 2011; Stanford et al, 2014). They increase fishers' self-esteem and their trust in the group's ability to manage (Rivera et al, 2017; Yamazaki et al, 2018), and have made state institutions more accountable and responsive to them (Njifonjou, Satia and Angaman, 2006).

In a case study from West Sumatra in Indonesia Stanford et al (2014) demonstrate how community solidarity and a common vision for a better future had led to improved economic opportunities, as members were allowed financial loans thanks to their being part of this group, rather than having to seek them individually. One member summarised that "Our future and our children's future is tied up with this group – with these repayments. We are much stronger in the group than outside of it" (Stanford et al, 2014, p. 22). Support networks are particularly important for community members in small-island communities, where many households rely heavily on artisanal fisheries for their livelihood and where fishing is carried out within a restricted geographical area using simple equipment, Yamazaki et al (2018) argue. In such settings fishers' personal connections – including ones outside the fishery – may provide an informal mechanism for a transfer of information that influences fisheries production, for example the timing and location of fish concentration.

The key role social capital plays in establishing sustainability in small-scale fisheries is strongly emphasised in a comparative analysis by Kosamu (2015). The study assessed the degree of state involvement that may be the most effective in terms of achieving sustainability in small-scale fisheries in 17 cases from 12 developing countries (Chile, the Comoros, Ivory Coast, Malawi, India, Laos, Mexico, South Africa, Zambia, Zimbabwe, Senegal and Nigeria). The results show that the sustainability of the fisheries depended solely on the strength of social capital in the communities. The degree of state involvement made no difference unless the fisheries contributed to community trust, networks and shared norms and values. It is therefore important, Kosamu (2015, pp 371-372) argues, that in the case of fisheries that are dwindling as a result of

poor collective social capital, interventions be brought in that are aimed not at “ruling” the fishery but rather at (re)building local community cohesion.

Another study from the aquaculture sector in Sri Lanka explored how start-up motives can influence socio-ecological resilience, by examining five coastal shrimp-farming communities (Galappaththi, Galappaththi and Kodithuwakku, 2017). The study found that aquaculture cooperatives provide opportunities for networking, which in turn allow farmers to build stronger social ties and promote shared values. Self-organisation allowed for resources to be pooled, improved coordination and collective action, fostered community cohesion and created safety nets that reduced risk for individual members. The significant role played by the network of community cooperatives highlights its transformative capacity and contribution to industry transformation.

The importance of administration

In order to move forward as a group, community organisations and networks need not only strong leadership and a shared vision but also reliable administration. The literature includes examples of how fair and reliable administration, organisational rules and structures enable the community to come together and collaborate on important issues such as logistics, fisheries management, leadership and dialogue. The literature likewise showcases examples of how weak administrative structures hinder cooperation between actors, thereby adversely affecting the group’s reputation amongst external actors as well as the community members’ chances of developing their businesses and increasing their incomes.

A study examining the impact community-based fisheries-management projects in Bangladesh had on fishing households’ welfare found that social capital – i.e. households’ ability to participate in decision-making, their level of knowledge and their influence in terms of securing access to fisheries – was the most significant factor contributing to an increase in household income (Islam et al, 2011). The study showed how administrative arrangements set up within the project’s Beel Management Committee increased group members’ ability to participate in decision-making, allowing them to elect executive members and leaders. By participating, fishing households not only improved their social links – in turn improving the group’s ability to move forward and create more prosperous businesses within small-scale fisheries – but also increased their participation in community affairs. Participation allowed them to influence fisheries management, they showed greater compliance with local fisheries rules, and fishers at the project sites have been able to resolve social conflicts more quickly than those at control sites.

Another case study examined the detail and complexity of livelihoods flowing from Oslob Whale Sharks, a community-based dive tourism business, which was started and is owned and run by a group of poor fishers in partnership with local government in the Philippines (Lowe and Tejada, 2019). The study found that dive tourism had created alternative livelihoods for 177 fishers and diversified livelihoods throughout the community. Resources coming from tourism increased food security for fishers and their families, and improved the wellbeing of the community. The success was the result of many factors, such as community and government cooperation, access to finance and community acceptance. Recurrent and reinvigorating community meetings were important in order to secure acceptance and the continuity of Oslob Whale Sharks tourism activities. At these meetings members were allowed to exercise their power through voting. Other

meetings were held to facilitate dialogue and create awareness and acceptance. Devising administrative functions and structures for inclusion of community members is regarded by the authors as being important in terms of giving a voice to the most marginalised, including fishers, older people and women in the Philippines.

Another study of factors affecting livelihoods in fishing communities in West Sumatra by Stanford et al (2014) found that the failure of community fisheries organisations was in part due to weak administration and leadership. Regarding the absence of routines and strong leadership, a frustrated respondent said "We only have meetings if there is government money coming! There are no monthly or even annual meetings. It simply depends on whether money is coming or not. No money = no meeting." (Stanford et al, 2014, p. 23). The lack of routines and administrative structure made it difficult for group members to change the leadership. Moreover, the disciplinary rules that did exist were not applied. Group members understood that in spite of having signed an agreement stating they would be penalised if they failed to make repayments to the group as agreed, such regulations were never enforced, because no-one was bold enough to do so. In such a closely knit community the fear of disrupting social harmony can be a powerful disincentive to enforcement of sanctions, the authors conclude.

Capacity building for blue businesses

A number of studies show that increasing the local communities' capacity in terms of greater efficiency and adaptation can have positive results for several blue businesses and livelihoods.

A study from the Philippines describes how a seasonal ban on fishing for sardines, which initially met with critic and scepticism in affected communities, was later accepted and led to increased fish landings, increased incomes for fishing crews and the creation of alternative livelihoods for factory workers within the processing industry during the closed seasons (Rola et al, 2018). Evidence-based decision-making based on close cooperation between the sardine industry and the science community, stakeholder participation in the policy process and provision of training for employees working in the processing industry affected by the policy were important considerations in promoting acceptance. The industry together with national agencies provided a capacity-building programme to address the expected unemployment.

Results from a Kenyan case study that maps the process of establishing locally managed marine areas showed that the existence of donor funding and capacity building were critical to all 19 areas studied (Kawaka et al, 2017). The communities affected received technical support and training in community-based marine-resource management, for example an exchange visit to an existing locally managed marine area. The authors regard such capacity support as a significant trigger for communities to establish their own managed marine areas.

An economic study of pearl farming in Tanzania describes how communities engaging in community-based aquaculture were often found to be poorly organised and lacking in business training and financial knowledge relating to budget management (Saidi, Johnston and Southgate, 2017). It concludes that improved technical and husbandry skills that increase production and improve efficiency and product quality, including sales and marketing, reduce the likelihood of making zero profit or a loss. Another example from Tanzania following women working in the field

of shell handicraft found that only a fraction of women were engaged in both shell handicraft and the much more profitable activity of pearl farming (Fröcklin, Jiddawi and de la Torre-Castro, 2018). Farming of pearls requires swimming skills, which none of the women interviewed possessed. The few women involved in pearl farming were accompanied by their spouse or a male relative.

4.3.2 Well-functioning value chains

A value chain covers the full range of activities required to bring products to the end consumers. Each product, for example wild caught fish, farmed seaweed or farmed shrimp, will have its own value chain, depending on the production method, the product qualities, the marketing channels established and the intermediaries involved. Some products will be sold fresh, directly in the local community, whereas others may be traded, stored, processed and exported to consumers elsewhere. A well-functioning value chain has the potential to create economic, social and environmental benefits for the community.

The articles reviewed identify the following factors that influence the capacity of value chains to generate benefits for local communities: market structure, demand for the product and access to markets, presence of infrastructure, and location and expertise in business and finance. Figure 8 shows the distribution of articles used in this chapter by geographical region and sector.

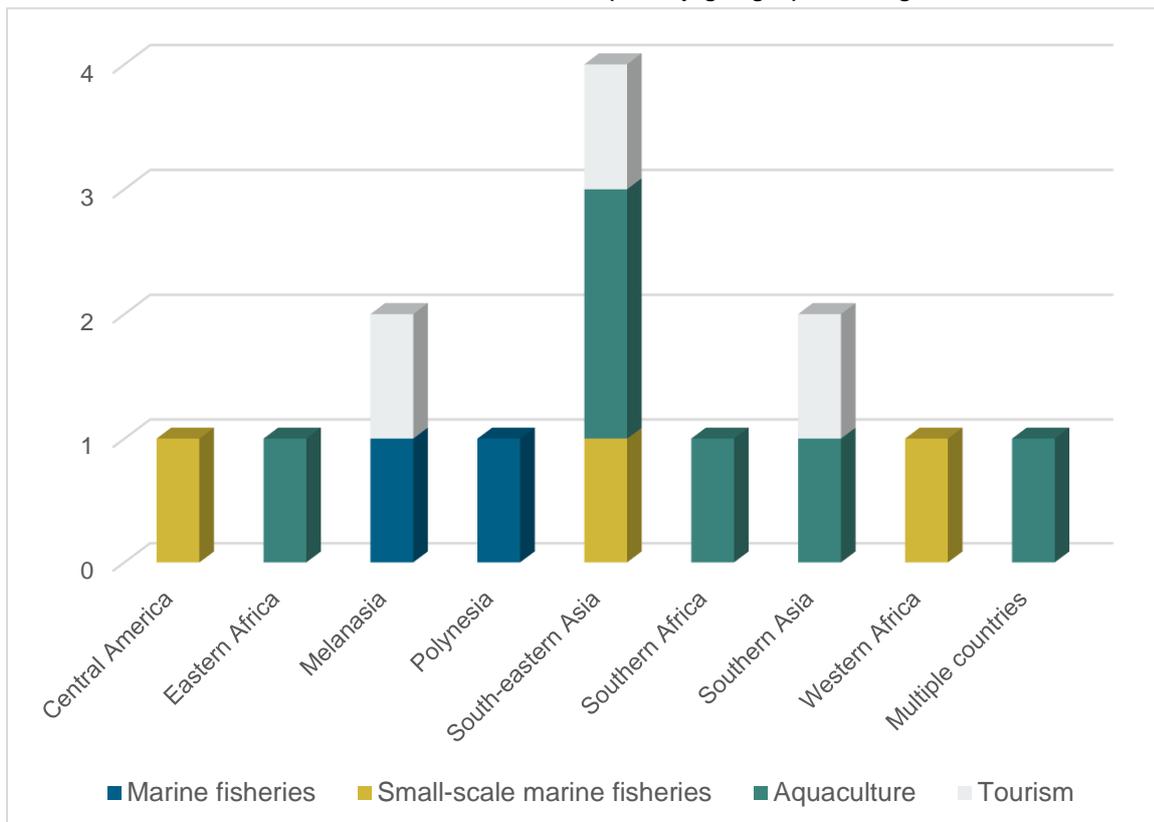


Figure 8 – Distribution of the studies supporting Chapter 4.3.2 by sector and region

Market structure

Market structures are mainly characterised by the level of competition between market actors. Markets are classified in terms of the presence or absence of competition. There is a scale from perfect competition to pure monopoly. In the real world pure monopoly is rare and perfectly competitive markets are practically non-existent. The most common types of market structure are monopolistic competition and oligopoly. In monopolistic competition there are many market actors, each selling somewhat different products that are not perfect substitutes for each another. In an oligopoly there are only a few actors, and each one knows who its rivals are.

The number of buyers is one factor that seems to influence local communities' possibility of getting a good price for their products and thereby increasing their income. If there are only a limited number of buyers and the market structure is oligopolistic, then the possibility of getting a fair price for the products is lower (Rivera et al, 2017; Weigel et al, 2015; Nor et al, 2017). Privatisation and foreign direct investment are also mentioned as factors contributing to increased earnings for local communities (Orchard, 2015; Hishamunda & Ridler, 2006). Hishamunda and Riedler (2006, p. 410), for example, mention that "Madagascar has experienced rapid aquaculture expansion because of the commercial sector. Fish stations have been privatized with positive results for fingerling supply. It has also attracted direct foreign investment. Its annual aquaculture output growth rate during 1992-2001 was 19 percent, an annual rate of growth higher than the global average."

Demand for the product and access to markets

Development of a value chain depends on local demand for the product, or the possibility of access to markets where demand exists. When trying to improve livelihoods by introducing a new production in a coastal community, it is important to investigate demand for the product and whether market access is possible. A successful example of this in the literature is a project introducing fishing for marine ornamentals in Papua New Guinea (Schwerdtner Máñez, Dandava & Ekau, 2014). It started in 2007, as a result of interest on the part of large marine-aquarium retailers. The evaluation of the project showed that marine-aquarium fishing does provide benefits for local fish collectors. For the fishers who were involved in the project, selling ornamental fish contributed 8-17 percent of their weekly income. Two other studies provide examples of value-chain development that can be linked to access to markets and a clear demand for the product. The first is from Zambia and Zimbabwe, where the farming of tilapia was seen to have intensified as a result of strong demand in urban areas (Hishamunda & Ridler, 2006). The second example analyses the possibility of half-pearl farming in Tanzania. Saidi, Johnston and Southgate (2017) conclude that there is potential for large-scale production of half-pearls in Tanzania. This is thanks to tourism, which has the potential to generate domestic demand for pearls, and the presence of gemstone production industries with well-established international networks, which opens up possibilities for export.

Aquaculture projects in Africa, which have previously been funded by donors with no regard for market demand, have not been profitable enough to attract farmers in the long run. One such example is tilapia farming in Senegal, where farmers lost interest owing to a lack of financial

incentives (Hishamunda & Ridler, 2006). Olivier, Heineken & Jackson (2013) conclude that poor access to international markets and importation of subsidised products hamper the profitability and development of oyster and mussel cultivation in South Africa.

Tourism may be economically beneficial for local communities, as a mechanism that can boost demand for fishery products. Local fishers in Palau and the Philippines can increase their profits by selling their catch to tourists at a higher price, two studies found (Vianna et al, 2012; Lowe & Tejada, 2019). Fishers may also earn extra money by providing tourists with the opportunity to take part in the fishing (Mozumder et al, 2018). However, in one article about Cape Verde the authors conclude that restaurant owners receive most of the added value, since they are able to sell seafood at much higher prices (Garcia Rodrigues & Villasante, 2016). In the Philippines it was also observed that development of tourism has the potential to reduce pressure on fish stocks. Lowe et al (2019, p. 91) conclude that “alternative livelihoods from whale shark tourism improve conservation status by reducing the fishing effort”.

Presence of infrastructure and location

Infrastructure is one factor that facilitates access to markets. When infrastructure is available, affordable and reliable, it can potentially lower transaction costs, improve market access and connect workers to their jobs.

Few studies directly target the role of infrastructure for local blue growth. The absence of export facilities, such as access to ports and export agents, can be a hindering factor (Nor et al, 2017) or a facilitating factor (Schwerdtner Máñez, Dandava & Ekau, 2014).

Expertise in business and finance

Skills in aquaculture, fishing or processing are seldom enough if one wants to start or develop an economic activity. Marketing skills, logistics and business knowledge are also of importance. When it comes to marketing, it may be that there is a lack of simpler skills, like the ability to use on-line marketing services or knowing how to approach buyers, but more complex skills in marketing strategy and financial investment may be sought after (Nor et al, 2017; Siaoisi et al, 2012). Access to correct and updated information is also of importance when making business decisions, as the use of incomplete and incorrect data might lead to economically and environmentally harmful decisions (Pradhan & Flaherty, 2015). The importance of technical training and capacity building is elaborated on in [Chapter 4.3.1](#).

4.3.3 Legal frameworks and policies

Policies and laws define a significant part of what individuals and organisations can or cannot do in society. They set the boundaries for how individuals and organisations relate to one another in the public arena, and to a lesser degree privately. Laws and policies are essential for determining how natural resources are exploited, how products are processed, consumed and traded, how organisations relate to their employees and to one another, and how organisations structure their economy. Policies and the legal framework therefore shape many of the opportunities and constraints for the blue economy in any jurisdiction.

According to the articles reviewed, the following considerations determine how the legal framework and policies affect blue growth at local level: the coherence and predictability of laws and policies, the degree to which they grant and protect access to natural resources, the degree of support given to small-scale enterprises vis-à-vis large-scale ones and the degree to which policy and law-making processes take local circumstances into consideration. Figure 9 shows the distribution of articles used in this chapter by geographical region and sector.

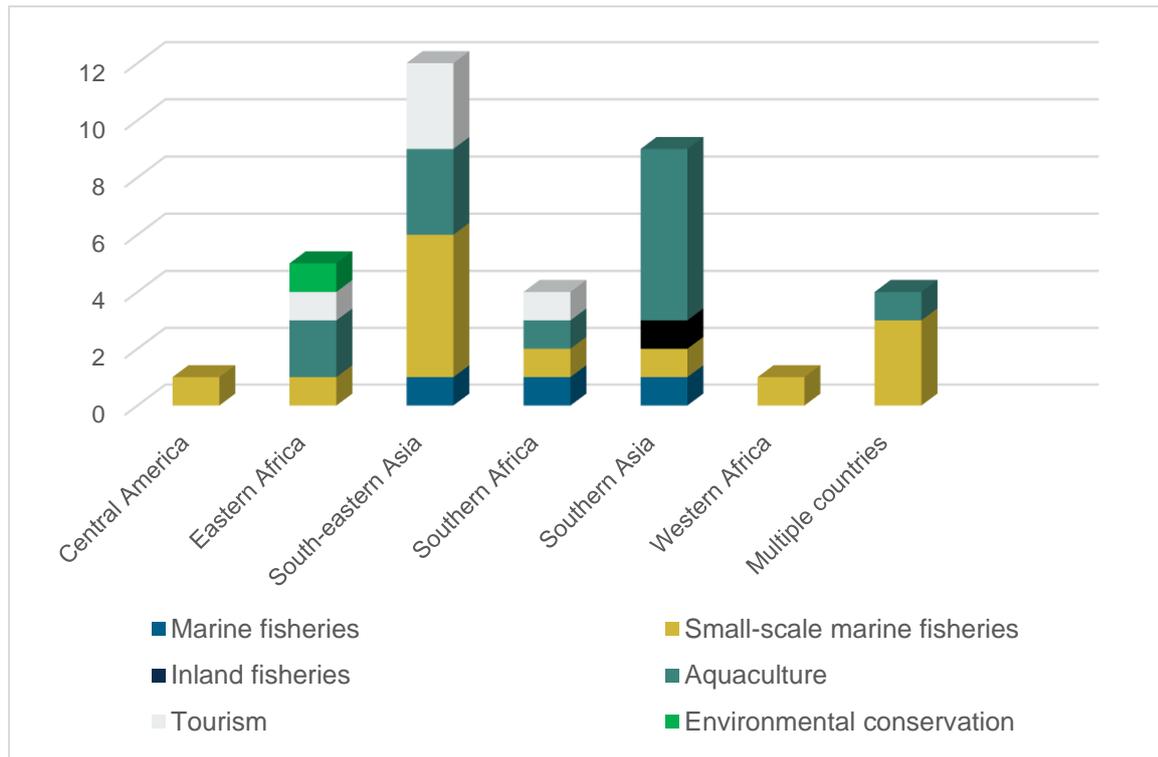


Figure 9 – Distribution of the studies supporting Chapter 4.3.3 by sector and region

Coherence and predictability

The evidence contained in the studies reviewed, relative to the importance of coherence and predictability of policies and legal frameworks, mostly relates to the absence of these two considerations. All authors find that a lack of policy and legal coherence or predictability invariably has a detrimental effect on blue growth at local level.

Most of the cases reported in the literature refer to the introduction of laws, policies or programmes without adequate consideration of consequences beyond the immediate purpose and scope of the law, policy or programme. Measures to enhance fisheries or aquaculture production were in some cases found to result in greater pressure on the environment and degradation of the resource base (Ramenzoni, 2017; Hanh & Boonstra, 2018). In other studies such measures have altered the socioeconomic conditions in the community in ways that have favoured those with more power and resources, whilst reducing opportunities for the less well-resourced (Sabu & Shaijumon, 2016; Pant et al, 2014; Ramenzoni, 2017). Despite the benefits of

environmental regulations reported in several studies (see [Chapter 4.3.4](#)), Du Preez & Lee (2010) discuss the risks for the economy of South African rural communities in the light of the proposed eradication of invasive trout species from rivers and streams in accordance with the National Environmental Management: Biodiversity Act of 2004. Unless areas where trout fly-fishing traditionally takes place are demarcated by conservation authorities, this important economic activity will not be allowed to continue, with dire consequences for the communities.

Two other studies from Eastern Africa discuss the importance of tax policies for the competitiveness of sectors of the blue economy, including vis-à-vis foreign competitors (Ateweberhan, 2018; Jury, Cuamba & Rubuluza, 2011). One of these studies argues that the lack of adequate policies and regulations resulted in poor coordination between institutions, which in turn was the main stumbling block for the development of community-based aquaculture and for poverty alleviation in small-scale fisheries-dependent communities (Ateweberhan, 2018).

A few studies highlight the importance of evidence about the system targeted by a given policy or law and about the consequences of their introduction as regards reducing the risk of unintended effects of that policy or law (Rola et al, 2018; Watanuki & Gonzales, 2006). Others refer to the benefits of a stable policy and legal framework in terms of allowing stakeholders sufficient time to understand, accept and adapt to that framework (Yang & Pomeroy, 2017; Barnes-Mauthe, Oleson & Zafindrasilivonona, 2013). Finally, some studies underscore the importance of authorities having sufficient law-enforcement capacity for implementation of management regimes. This consideration is further discussed in [Chapter 4.3.4](#).

Granting and protecting rights of access to resources

Several studies identify the granting of rights to access and use natural resources as an important condition for local blue growth (Saidi, Johnston & Southgate, 2017; Pomeroy et al, 1997; Sowman et al, 2014; Haque & Dey, 2016; Khan, Alam & Islam, 2012). Pomeroy et al (1997), for example, found that awarding exclusive rights to restored resources such as replanted mangroves, artificial reefs and fishing grounds around fish-aggregating devices contributed to improved wellbeing for the community. The authors do not discuss the mechanisms underlying such improvements, and caution against the possibility of some of the gains actually resulting from livelihood-improvement activities on land. For floodplain fishers in Bangladesh, increased household incomes were also found to result from fishers retaining property rights through community-based fish-culture systems, alternating fish and rice cultivation (Haque & Dey, 2016). Gains on the part of land-owning and landless stakeholders differed, but there were considerable increases in production for all groups at the study sites.

One study from Tanzania briefly alludes to difficulties in accessing credit for investments in pearl-oyster culture because of farmers not possessing registered property that could qualify as bonds (Saidi, Johnston & Southgate, 2017). Property or other tradable rights could potentially plug that gap and facilitate access to finance. For small-scale fisheries development in historically disadvantaged communities in South Africa, however, it was found that community-based rights allowed a greater number of fishers to gain access to the resource than through individual rights-based or case-by-case permit-allocation systems (Sowman et al, 2014). Gains for each individual

fisher in the community-based system were less than in the latter two systems, but economic opportunities were maximised through collective action and economies of scale. But there remained the fear that powerful groups in the community would take excessive control and benefit disproportionately at the expense of disadvantaged members, thereby highlighting the need for government to provide guidance and support regarding such a governance model.

Insufficient public-authority capacity and inadequate coordination between these authorities are mentioned by some authors as major hindrances to securing access and usage rights to marine resources (Ateweberhan et al, 2018; Lowe & Tejada, 2019). Another limitation related to the issue of stability mentioned in the previous section is the short duration of property and access titles. This factor was found to generate insecurity, inhibit investment and promote a short-term profit-making attitude in the blue economy (Olivier, Heinecken & Jackson, 2013; Jury, Cuamba & Rubuluza, 2011).

As discussed in [Chapter 4.3.1](#) the existence of local-level organisations and networks is important for local blue growth. However, a few studies point out that the mere existence of these organisations and network is not enough, and that recognition by government is also necessary (Kosamu, 2015; Freduah et al, 2018; Phala et al, 2019; White et al, 2006). For local-level organisations to be able to implement sustainable resource-management practices and foster blue growth, it may be necessary for government to entrust them with regulatory and enforcement powers (Lowe & Tejada, 2019).

Supporting small-scale enterprises

Governments can provide opportunities for local blue growth by means of policies and laws that support private-sector development, as is shown by several of the studies reviewed. Nationwide reforms providing greater economic liberty, ensuring property and investment rights and promoting economic integration with external parties, whilst at the same time improving government efficiency, are considered an important factor for income gains in small-scale fisheries and aquaculture in Vietnam (Hanh and Boonstra, 2018). Providing capacity development for business planning and management, granting public financial guarantees to back private lending, putting in place emergency relief measures to avert environmental risks and providing public loans for investment in productive equipment are policy measures that, according to several authors, can lead to economic gains for local communities in different sectors of the blue economy (Narayanakumar & Krishnan, 2013; Haque & Dey, 2017; Hishamunda & Ridler, 2006; Olivier, Heinecken & Jackson, 2013; Rivera et al, 2017).

Authors such as Ramenzoni (2017) highlight the fact that the opportunities created by policy and legal reforms are seldom distributed equally between all groups in a community. Benefits from investment opportunities and technological innovations not infrequently accrue to actors who were better off at the outset. Such distributional imbalances are not always visible when a law or policy is implemented, and may only become apparent much later. Some authors discuss this consideration in terms of governments favouring large-scale operators over small-scale ones. This is the case, for example, in South Africa, where 70percent of the revenues from a high-value lobster fishery accrued to the large-scale segment (Ward et al, 2018). In the aquaculture sector

the complexity and cost of administration render mariculture largely inaccessible to small-scale investors (Olivier, Heineken & Jackson, 2013). Ateweberhan et al (2018) found that policies for the intensification of aquaculture involving major financial and technological investment may require investment capacity and skills that are not available in the local community. In line with previous research cited by the authors, it is argued that this could lead to more top-down decision processes and further marginalisation of local stakeholders. In Bangladesh the policy of leasing inland fishing rights to the highest bidder for periods of one to three years has concentrated those rights in the hands of wealthier parties, relegating poor fishers to the role of day labourers for the lessees (Khan, Alam & Islam, 2012). Support provided by donors to counter such socioeconomic imbalances has often been too short-term to enable poor communities to transition out of poverty, and has instead been used mainly as a source of income, as was found by a study of community-based aquaculture in Eastern Africa (Ateweberhan et al, 2018). Experiences from Zambia and Indonesia show that policies encouraging linkages between small- and large-scale aquaculture farms can benefit the former by facilitating the dissemination of new technologies and enabling economies of scale (Freduah, Fidelman & Smith, 2019).

Considering local circumstances

Many of the shortcomings discussed in the sections above result in part from a mismatch between the aims of a given policy or law and how it is enforced on the one hand and the priorities and needs of the target population on the other hand. A number of studies suggest that due consideration of the local circumstances is necessary in order for policies and laws to generate their intended local blue-growth benefits. As with several of the mechanisms mentioned previously, much of the evidence comes from situations in which insufficient attention to local circumstances prevented local blue growth. Only in a few cases were the authors able to establish positive correlations between local blue-growth development and adequate consideration of local circumstances.

The studies reviewed point out several considerations to which governments need to pay special attention. The first is the adequacy of the policy and legal framework for the subsistence needs of affected populations (Hossain et al, 2018; Saidi, Johnston & Southgate, 2017; Pant et al, 2013; Damastuti & de Groot, 2017; Freduah, Fidelman & Smith, 2019). Measures aimed at restricting access to resources are unlikely to succeed unless adequate and sustainable livelihood alternatives are provided for those who stand to lose from the implementation of such measures. Insufficient involvement of affected populations in the design and enforcement of new policies and laws is mentioned as the main reason for their failure, and for the negative consequences of new policies and laws for local blue growth. Without the involvement of the populations affected, governments are often unable to understand the local drivers of resource depletion and the reasons behind the populations' unwillingness to change behaviour. In contexts where public authorities lack enforcement capacity, the support of local stakeholders may be necessary for enforcement of laws and policies affecting their livelihoods (Crawford et al, 2010; Kosamu, 2015; Kawaka et al, 2017).

Information plays an important role in the relationship between government and stakeholders, as is highlighted by several authors (Ateweberhan et al, 2018; Galappaththi, Galappaththi &

Kodithuwakku, 2017; Mustika et al, 2012; Stanford et al, 2014; Kleiber, Harris & Vincent, 2014; Damastuti & de Groot, 2017; Lowe & Tejada, 2019; Sowman et al, 2014; Pradhan & Flaherty, 2008; Freduah, Fidelman & Smith, 2019). Insufficient information about how local circumstances affect sustainability is discussed in terms of inadequate or incomplete mapping of stakeholders leading to information not reaching them (Kleiber, Harris & Vincent, 2014), insufficient data for making well-informed management decisions (Kleiber, Harris & Vincent, 2014; Pradhan & Flaherty, 2008) and resource users either remaining unaware of or purposely ignoring information about their impact on sustainability and thereby failing to adopt new practices (Mustika et al, 2012; Freduah, Fidelman & Smith, 2019). Examples of information sharing supporting the implementation of laws and policies include public and civil-society organisations supporting resource users in their adoption of desired practices (Galappaththi, Galappaththi & Kodithuwakku, 2017; Lowe & Tejada, 2019; see [Chapter 4.3.4](#)) and increasing the awareness of rights on the part of historically oppressed coastal communities in South Africa, in order to allow them to have a say about the regime for more equitable access to resources (Sowman et al, 2014).

Dialogue with local stakeholders, some authors suggest, is necessary in order for local knowledge to be taken into consideration and for stakeholders to take ownership of the new measures (Watanuki & Gonzales, 2006; Nor et al, 2017). In a study exploring social and economic drivers for choosing aquaculture as a coastal livelihood amongst households in Tanzania, Slater et al. (2013) conclude that inclusive stakeholder dialogue increases the chances of success when introducing new culture systems. Dialogue processes need to be in place for coastal communities to inform policy-making, so that governing bodies can understand drivers such as the perceptions, needs and expectations of communities. Morgan et al (2017) arrive at similar conclusions, and argue that the literature on aquaculture tends to focus on technical considerations and ignore ethnic and cultural norms such as power relations and differential access to land.

4.3.4 Environmental regulations

Results from the quantitative analysis indicate that the presence of institutions for resource management, as well as policy coherence, institutional coordination and collaboration, increase opportunities for achieving both higher incomes and environmental sustainability. Achieving these two goals is often a complex process in which short- and long-term needs and goals need to be balanced. Limiting marine-resources exploitation can lead to lower incomes in the short term, but might help secure livelihoods for future generations. Allowing resource use that is unsustainable in the long run might, however, be necessary in order to safeguard local communities' livelihoods in the short term. The literature reviewed presents examples of how environmental regulation can tackle these situations. Some of the mechanisms recurrently mentioned as being important for successful outcomes include evidence-based and context-adapted regulations, banning harmful practices and monitoring and enforcement. Figure 10 shows the distribution of articles used in this chapter by geographical region and sector.

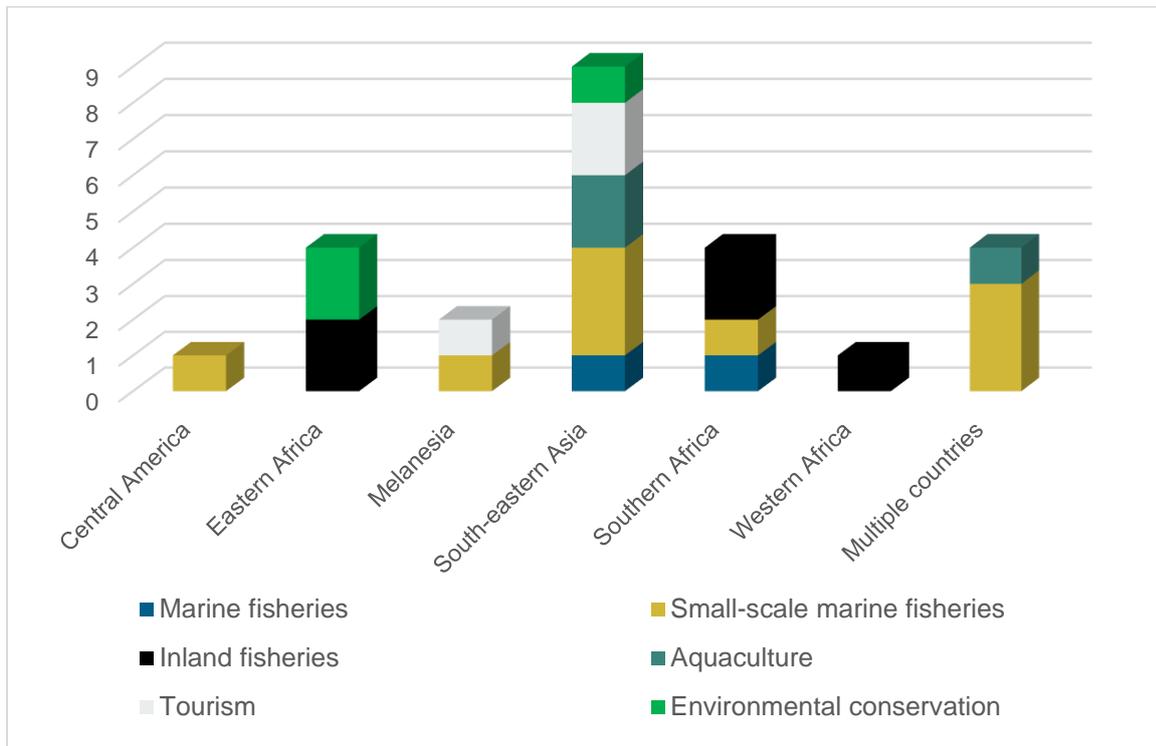


Figure 10 – Distribution of the studies supporting Chapter 4.3.4 by sector and region

Context-adapted environmental regulations

Because most coastal communities in developing countries depend directly on natural resources, regulations affecting access to and use of those resources are often critical for local blue growth. A study of the economic impact of community-based dolphin watching on the local economy in northern Bali, Indonesia illustrates this point. Mustika et al (2012) found that if the dolphin-watching industry ceased to exist, surrounding communities would lose at least 46 percent of their income from associated tourism activities. Regulations to protect dolphin populations, such as limiting the number of tourist boats participating in dolphin trips and restricting tourists' behaviour, are therefore of great importance for those communities.

Balancing the use and conservation of natural resources can be achieved by using a number of management tools and applying various policies. The literature reviewed provides numerous examples of how restrictions regarding use of and access to marine resources have affected communities that depend on them for fishing, farming and tourism. There are several studies looking at the effects of establishing marine protected areas (White et al, 2006; Ward et al, 2018; Weigel et al, 2015; Armada et al, 2018), locally managed marine areas (Kawaka et al, 2017), marine and freshwater reserves (Brunnschweile, 2010; Solomon, Jacobson and Liu, 2012), mangrove conservation projects (Ha, van Dijk and Bush, 2012), reef restoration (Fadli et al, 2012; Watanuki and Gonzales, 2006; Islam et al, 2014), no-take zones (Crawford et al, 2010) and seasonal and total fishing bans (Rola, 2018; Purdy, 2017). Individual studies point out specific mechanisms concerning why a project or policy has succeeded or failed. However, what works in

one setting might not work in another one, and only a few generalisations regarding use of different marine and freshwater resource-management tools and the results of such usage are possible. As discussed in the previous chapter, many studies conclude that decisions need to be evidence-based, and regulations have to be implemented in close collaboration with the local communities affected in order to maximise benefits for the environment and the local communities. Engaging with stakeholders throughout the process of creating and implementing regulations allows for them to be adapted to the local context, and enables community members to develop a better understanding of their purpose (Islam et al, 2011; Mustika et al, 2012; Rola et al, 2018; Moorhead, 2018; Njifonjou, Satia and Angaman, 2019; Solomon, Jacobson and Liu, 2011). As also discussed in [Chapter 4.3.3](#), it is moreover beneficial if the effects of regulations are communicated to and discussed with the stakeholders whose livelihoods are affected.

Banning harmful practices

Some studies explore how banning certain practices affects fishing communities in developing countries. Examples from small-scale fisheries in Malawi and Botswana and from aquaculture in Indonesia suggest that in order to tackle challenges such as overfishing and environmental degradation, whilst at the same time protecting livelihoods, banning certain harmful practices is more efficient than placing a total ban on a whole sector (Mosepele and Kolawole, 2017; Damastuti and de Groot, 2017, Kosamu, 2015; Donda, 2017). Such partial bans should be accompanied by capacity building and information for affected stakeholders, in order to minimise damage to livelihoods.

Mosepele and Kolawole (2017) argue that a key problem for inland-fisheries development in developing countries is a lack of capacity development and ill-informed management. Well-managed fisheries, they argue, can have positive effects on rural and socioeconomic development. In several cases in Botswana the authors found that perceived overfishing led to the banning of a number of inland-fishing practices. A ban on drive fishing in the Okavango Delta and a one-year fishing ban in Lake Ngami in 2015 led to decreased fishing efficiency amongst small-scale commercial fishers, with a subsequent loss in revenue. Improved fisheries management would have been more productive than a total ban, the authors argue.

Even if only temporary, fishing bans are problematic as regards livelihoods and food security if no compensation or opportunities for adaptation are provided. Another important consideration discussed in [Chapter 4.3.3](#) is providing affected stakeholders with information and capacity in connection with the purpose of a given regulation (Damastuti and de Groot, 2017). The authors refer to the financial losses and the fear amongst fishers resulting from a national ban on mud-crab fishing that was not accompanied by any educational initiatives or compensation scheme.

A successful example of the introduction of a ban on harmful fishing practices is the ban on nkacha nets in Lake Chiuta in Malawi (Kosamu, 2015; Donda, 2017). In order to improve sustainability and tackle the harmful effects of using small-mesh nkacha nets, community management committees were formed. The committees decided to ban the use of nkacha nets, and the Malawi Department of Fisheries was asked to legally endorse the decision, which is still in force today. The ban has minimised aquatic habitat degradation and contributed to a gradual recovery of the aquatic habitat and fish stocks, as well as to improvements in the quantity of fish in the local market.

Monitoring and enforcement

Previous examples argued how environmental regulations and sustainability policies need to be accompanied by capacity building and informational campaigns. Several examples in the literature point out how policies and regulations in the fields of small-scale marine fisheries and conservation need to involve adequate monitoring and enforcement (Watanuki and Gonzales, 2006; Rola et al, 2018; Rivera et al, 2017; Kawaka et al, 2017).

Kawaka et al (2017) studied the effectiveness and sustainability of the rapid increase in locally managed marine areas in Kenya. With the primary purpose of conserving fisheries and marine resources and securing alternative sources of income, 24 areas had been established by 2015. Despite general recognition of the importance of enforcement, a common weakness was poor enforcement of regulations, with only four areas being patrolled regularly. The authors recommend that enforcement be given greater prominence early in the establishment process. This should build on successes from elsewhere in Eastern Africa, such as the Tanga Coastal Zone Conservation and Development Programme, where enforcement patrols were performed jointly by government and community representatives. The authors' view is that the rapid increase in Kenya's locally managed marine areas is promising, but that their long-term effectiveness and sustainability depend on the quality of enforcement and financial management.

5 Discussion

This chapter begins by summarising the main factors affecting local blue growth as discussed in [Chapter 4](#). It then analyses strategies for blue growth from different parts of the world, comparing them with those results. The chapter ends with a reflection on the role of development cooperation in blue growth at local level.

5.1 Summary of factors affecting local blue growth

The factors affecting local blue growth presented in the previous chapter can be grouped under five main subjects: *coherence and predictability* of governance; *capacity and technical skills* at the different levels; with respect to social sustainability, *adaptation to local circumstances*; with respect to environmental sustainability, the *efficiency and enforceability of regulations*; and with respect to economic sustainability, *well-functioning value chains* that favour local actors, in particular vulnerable ones. This chapter closes with a brief reference to other factors that affect societal development more broadly and that also play a role in terms of local blue growth.

5.1.1 Coherence and predictability

Coherence and predictability are firstly discussed in terms of the characteristics of local organisations and networks. The results indicate that social capital is important for cohesion, trust, solidarity and mutual support amongst community members. It creates a safety net that reduces risks for each individual. Social networks can also facilitate access to information, mutual learning and pooling of resources, as well as contacts for jobs and business opportunities.

Governance is greatly affected by the quality of leadership. Leadership needs to be dynamic and engaged, and has to bridge the gap between the community and other levels of government. Leaders need to be accepted and legitimised by the community. Leaders with good networking abilities may help create new opportunities for the community.

The results also highlight the importance of reliable administration to the proper functioning of community-based organisations and to the wellbeing of community members. Excessively complex administration and bureaucracy pose particular challenges for less well-resourced stakeholders, and may create or reinforce imbalances between different groups in a community.

Legal frameworks and policies that are coherent and predictable over reasonable periods of time are important for local blue growth. Implementing laws and policies without taking account of the indirect consequences for the affected populations is likely to hamper their acceptance and thereby their effectiveness. The same is true when there is insufficient knowledge about the context in which the law or policy is being applied, or when institutional coordination is lacking. A coherent and predictable legal and policy framework is important for stakeholders to understand and have time to adapt to changes.

For resource users, access and use rights are important for the willingness and ability to invest. Secure access is linked to higher incomes from maritime activities and greater access to credit. Access and use rights must be granted in such a way as to avoid disproportionate capture by powerful groups. Rights should be of sufficient duration so as to promote a long-term perspective to management and discourage unsustainable practices.

5.1.2 Capacity and technical skills

This study shows that capacity and technical skills of institutions and individuals are relevant for local blue growth. Local-level organisations are more efficient if entrusted with regulatory and enforcement capacities by government. More broadly, enforcement and compliance monitoring capacities are necessary if policies and regulations for sustainable blue growth are to have an effect. Equipping local organisations with specific capacities related to the blue economy was also shown to create opportunities for blue growth and strengthen the resilience of local coastal communities. Similarly, for the individual, results show that having adequate managerial skills increases the chances of blue businesses prospering.

5.1.3 Social sustainability: adaptation to local circumstances

Recognition of and adaptation to the local context are alongside social cohesion the two most relevant social sustainability aspects highlighted in this review. It is mentioned above that laws and policies need to be designed and implemented with due account to the needs and priorities of affected populations. Dialogue and information sharing are essential for decision makers to understand the local context. They are also necessary for local populations to understand and accept the purpose and implications of decisions affecting them. Understanding how different population groups are affected is necessary for putting in any compensatory measures. Without such measures, enforcing decisions that restrict resource use but that are necessary for sustainable blue growth might prove unfeasible.

5.1.4 Environmental sustainability: efficiency and enforceability of regulations

The results of this review show that the efficiency of environmental regulations and their contribution to local blue growth depends on the degree to which they are adapted to the context in which they are to be applied. Affected populations need to be given sufficient time to understand regulations and their implications. Imposing bans on resource use practices need to take account of the needs of those populations, and partial bans that do allow some degree of exploitation might be necessary to ensure the enforceability of the bans. The efficiency of bans and other resource use restrictions depend on the extent to which they address the root causes of the environmental problem.

5.1.5 Economic sustainability: well-functioning value chains

Different characteristics of value chains affect the prospects for blue growth at the local level. Diverse and open markets tend to foster greater private sector development and higher incomes. For blue businesses to develop it is also important to understand demand, including from foreign markets, and adapt products and services to that demand. The policy framework and the quality of infrastructure are also important. Policies supporting the private sector and investments that involve local communities are more likely to foster local blue growth. Similarly, transport, housing and communication infrastructure can bring sellers and buyers closer together and widen business opportunities, thereby expanding opportunities for local blue growth.

5.1.6 Social-development factors not explored in this study

A few studies included in this review refer to factors other than those summarised above as being important for the development of societies in a broader sense, and therefore also for local blue growth (Njifonjou, Satia & Angaman, 2006; Sowman et al, 2014; Almaden, 2016). Those studies argue that poverty alleviation in coastal communities is not only a matter of increasing opportunities within blue sectors but also a question of schooling, gender equality, social services and broader socioeconomic structures. Lack of formal schooling entraps many fishers in poverty, as does the lack of a diversified economy that could offer alternative income-generating activities. Household characteristics such as size, access to labour and power relations, in particular related to gender, are also seen to affect the wellbeing of many coastal-community members. The authors furthermore allude to the importance of support structures, usually provided by the state – in particular for the most vulnerable community members. All these factors not only affect those engaged in the blue economy but also have a bearing on coastal communities' blue-growth prospects.

5.2 Findings in the light of regional blue-economy strategies

This study's findings are based on a multitude of local examples from around the world, with an emphasis on coastal communities in Africa and South-eastern Asia. This section examines how blue-economy strategies from these regions are in line with or relate to the general findings.

5.2.1 The African Blue Economy Strategy

In 2019 the African Union developed a blue-economy strategy with the objective of guiding the development of an inclusive and sustainable blue economy that contributes significantly to African transformation and growth (AU-IBAR, 2019). The strategy presents 14 strategic objectives within the following nine areas of intervention: blue governance and institutional change; shipping; ports; fisheries and aquaculture; renewable energy; minerals, oil and gas; innovative industries; coastal tourism; ecosystem services, including blue carbon and resilience. The strategy proposes several interventions for each of the objectives.

The African Blue Economy Strategy objectives and proposed interventions are for the most part in line with the results from this study. In particular, the strategy emphasises the importance of institutional coordination, inclusive value chains and hard infrastructure, investment security, private/public partnerships, communication strategies, and environmental protection for sustainable management. As a regional strategy, it also contains several proposals for enhanced regional cooperation. On the other hand, it does not specify the organisational level at which most of the proposed interactions need to take place. During implementation it will be important for each country to consider the proposed interventions at the different levels – from national to local. In the light of this study the African Blue Economy Strategy may support local blue growth particularly well where multiple interventions are implemented locally at the same time. Moreover, the needs, priorities and circumstances of affected coastal communities must be taken into account in order for interventions to have a positive impact on blue growth at local level, as is also demonstrated in this review. The strategy will help where locally adapted interventions simultaneously target several areas such as policy coherence, market development and sustainable natural resource management.

The African Blue Economy Strategy expresses the ambition of boosting the economy through shipping and industrial fisheries, but also states a belief in more diverse blue businesses, including integrated and sustainable tourism, ornament fishing, sustainable aquaculture, renewable energy and carbon storage.

One of the African Blue Economy Strategy interventions has the aim of “maximizing benefits” from high-seas fisheries, whereas others target the exploitation of offshore minerals (oil, gas and deep-sea minerals). These industries entail not only uncertain economic opportunities but also significant environmental risks, none of which are covered by this study. Moreover, the trickle-down positive effects on the wellbeing of local communities are far from evident, and would need to be supported by more extensive studies.

The technologies applied in the offshore environment often require advanced equipment and know-how, and generally call for a very high level of capital investment – a need that applies to both traditional and new offshore activities. This study has pointed to the challenges of developing small-scale and coastal industries, generally resulting from the low technical and investment capacity of small coastal-community members. Moving further offshore, as required in order to reap some of the potential described in the African Blue Economy Strategy, involves developing domestic offshore capacity, unless exploitation is to be leased to foreign companies. Such capacity is not only technological but also institutional, as many developing countries lack

the requisite policy and legal frameworks for the planning and management of larger offshore operations. Strategic investment in the development of such offshore capacity may be relevant for some countries. In line with the strategy, this study has provided examples of the importance of parallel development of regulatory frameworks and de facto involvement of stakeholders in the exploitation of new and traditional marine resources – the latter being less pronounced in the strategy.

5.2.2 Blue-economy strategies in Southeast Asia

The Asian Development Bank Strategy 2030 focuses on economic development with little emphasis on the blue economy or none at all (ADB, 2018). The bank is, however, engaged in the establishment of financial initiatives for the purpose of accelerating blue investments, and is developing a plan of action for healthy oceans and a sustainable blue economy (ADB, 2020). Meanwhile, the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) have launched a report on the blue economy for businesses in East Asia (Whisnant & Reyes, 2015) and the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), which constitutes a common marine strategy for 14 countries (PEMSEA, 2015).

PEMSEA approaches blue growth in East Asia from the perspective of the environment, highlighting that future revenues are at risk because of resource volatility or degradation. The vulnerability of coastal infrastructure to climate change is also emphasised. PEMSEA reasons that market opportunities are endangered because of the failure of industries to meet customers' environmental requirements. The opportunities for the blue economy lie in new markets based on environmental solutions and environmentally responsible investors. According to PEMSEA, a flourishing blue economy requires i) businesses that are founded on functioning ecosystem services; ii) governments that create enabling environments; and iii) innovative financing mechanisms such as blue bonds and investments that target and benefit both communities and companies (Whisnant & Reyes, 2015). This is in line with the findings of this study.

PEMSEA highlights multiple threats to the blue economy, such as depletion of fisheries' stock and unsustainable tourism. Opportunities include the branding of well-managed fish stocks and sustainable coastal tourism. The report also emphasises the potential and risks of offshore industries, as well as the challenges posed by those industries' competing claims for ocean space and resources.

The PEMSEA Sustainable Development Strategy for the Seas of East Asia, also from 2015, has the same point of departure as the PEMSEA report. In order to take advantage of opportunities and minimise risks, the strategy urges governments to protect the environment by multiple means, including boosting capital flows into environmental investments. The strategy also promotes the strengthening of the private sector, in particular small-scale businesses and private/public partnerships, and urges governments to mobilise civil society and make use of traditional knowledge in decision-making. In short, governments are requested to provide legal, administrative and financial instruments for sustainable blue-growth investments.

5.2.3 Local implementation of regional blue economy strategies

The strategic advice from the African Union and PEMSEA is largely in accord with the essence of the findings reported here. Functioning ecosystems are rightfully portrayed as a fundamental requirement for local blue growth³. Investing in local communities and their businesses is equally important. Because the strategies are regional, their implementation at national and local level will differ from country to country. In most contexts, however, successful implementation of strategy interventions is most likely to benefit from some of the key lessons learnt from this study: the importance of coherent policy and reliable administration, sufficient technical capacity at all levels, adaptation to the local context, enforceability of regulations, open and accessible markets, and well-functioning infrastructure.

5.3 The role of development cooperation in enabling local blue growth

This chapter discusses the current and future role of international development cooperation in supporting the blue economy and local blue growth in developing countries. The diversity of factors affecting such development is evidenced by the results of this study and the previous chapter's analysis of regional blue-economy strategies. The resilience of marine ecosystems and their connectivity, and the design, implementation and enforcement of environmental regulations are two of the critical considerations highlighted. Others include the different dimensions of poverty, the contribution of small-scale fisheries to food security and coastal communities' cultural and religious connection with the ocean.

A recent report by the Organisation for Economic Co-operation and Development (OECD) maps trends and policy instruments for promoting ocean-based industries and ocean sustainability in developing countries (OECD, 2020). It starts by pointing out how developing countries generally depend more on ocean-based sectors for income and jobs than OECD member countries do. On average, over 11 percent of GDP in lower-middle-income countries and 6 percent in low-income countries comes from marine fishing, aquaculture, seafood processing, shipbuilding and maritime transportation of passengers and freight. The corresponding figure for high-income countries is less than 2 percent. For low-income and lower-middle-income countries, marine fisheries tend to be especially dominant, contributing 6 and 8 percent of GDP respectively. Coastal and marine tourism also play a very significant role in the economy of some low-income and small-island developing states, accounting for over 20 percent of GDP.

Although the report provides a broad picture of the importance of the blue economy for both developed and developing countries, the statistics in it do not take into consideration the countries' diversity and their differing connections with the ocean. Geography, length of coastline, insularity, political system, economic diversification and degree of industrialisation are all factors that can affect the blue economy. The OECD study does not, however, analyse these factors separately, and thus does not provide a more contextualised analysis of the differences between

³ Another regional Blue Economy strategy with a strong emphasis on the link between human wellbeing and ecosystem services is the Caribbean Green-Blue Economy Strategy and Action Plan, which is under development as part of the Organization of Eastern Caribbean States (OECS) (CANARI, 2019).

countries. In reality, one can expect to see very pronounced differences in the degree of dependence on the blue economy amongst non-OECD developing countries. In some of these countries that dependence is marginal, whereas in others it is considerable.

Is the relevance of the blue economy for developing countries matched by the financial commitments to international development cooperation by OECD member countries? The data in the OECD report suggests that this might not be the case. The report presents the first official record of official development assistance (ODA) in support of the ocean economy. It finds that about 1.6 percent of ODA – an estimated USD 3 billion per annum – was allocated specifically to the ocean economy in 2013-2018. Of this amount only half was allocated to projects and programmes aimed at ocean conservation or the sustainability of ocean-based industries (OECD, 2020).

However, development cooperation can support the development of sustainable blue economies through means other than ODA. It can and does support the alignment of private finance through the provision of financial guarantees, such as the so-called blue bonds, insurance schemes and ocean impact investment funds. Between 2013 and 2017 almost USD 3 billion of private finance went towards supporting ocean-based industries and ecosystems, as well as reducing negative impacts from land-based activities (OECD, 2020). This sum is close to the ODA per annum over the same period.

The results of this study show that governance, institutions, capacity and skills are amongst the factors important to local blue growth. These areas are frequently targeted by international development-cooperation efforts. Although this kind of support might not be reported as targeting blue growth, it does so indirectly, even if its exact contribution cannot be estimated.

Looking beyond international development cooperation, the landscape of ocean finance becomes even more diversified and complex. Over the last few decades private investors, philanthropists, public/private partnerships and non-OECD development actors have been making increasing investments in developing countries' blue economy. Of these investors, China is the most important by virtue of the amounts contributed. An illustration of this shift is the fact that in 2015 philanthropic support for ocean-related issues for the first time exceeded that of ODA by nearly USD 30 million (Berger, Caruso and Peterson, 2019). When it comes to the role of China, at the 2018 annual Forum on China-Africa Cooperation President Xi Jinping pledged USD 60 billion in the form of aid and loans for new projects in Africa over the next three years (Wabnitz and Blasiak, 2019). Most of these newer types of investment are not reported in the same manner as ODA, and are generally difficult, if not impossible, to track. The same can be said of the impact of those investments, China being no exception. However, for their sheer size and influence they also need to be part of the equation as major contributors to ocean finance, and thus blue growth on all scales.

If one adds to the equation the domestic investments in the blue economy by the developing countries themselves, the share of ocean financing through international development cooperation is reduced even further. The role of international development cooperation for blue growth should not, however, be neglected. Not only does it provide support for areas of blue

growth that might not be targeted by investments whose main aim is financial return, but it is also frequently directed at governance and institutional considerations that make blue growth possible. There is ample evidence from the results of this study of the importance, even if indirect, of such considerations for blue growth at local level in developing countries. Supporting local blue growth that promotes human wellbeing through the sustainable use of the ocean requires investments not only in the water but also on land, as this study shows.

6 Conclusions and recommendations

6.1 Conclusions

Economic growth and wellbeing based on marine and coastal resources depend on investments in legal, social and economic institutions, physical and financial infrastructure, and well-functioning and inclusive markets.

This study finds that well-functioning value chains and greater social development are associated with higher incomes and wealth in developing countries' coastal communities. It also finds, maybe unsurprisingly, that the sustainability of marine and coastal resources depends on the resource-management regime, the coherence of policies and laws and how they are communicated. The study also shows that inadequate resource management and incoherent policy and legal frameworks are associated with lower incomes, wealth and employment.

The study concludes that the type and quality of governance are critical for blue growth at local level. Governance frameworks need to be coherent and reliable, leadership needs to be dynamic and legitimate, administration and enforcement need to be reliable and efficient, and decisions need to be adapted to local circumstances. Social cohesion and equity in access to resources are necessary for communities to develop in a balanced way. The study also underscores the importance of adequately capacitated individuals and organisations for the development of sustainable blue businesses and the efficient delivery of public policy that is evidence-based and adapted to context. Finally, the study also concludes that well-functioning value chains, open markets and adequate infrastructure of various kinds are all necessary for local blue growth.

Regional blue-growth strategies exist or are being developed for different regions of the globe. These blue-economy strategies incorporate the perspectives of sustainability and inclusiveness, and argue that blue growth requires both capital investment and robust legal frameworks. For future blue economy to grow and benefits to spread to local communities, many of the strategic interventions will need to be adapted to the local context and implemented in a coordinated manner.

Owing to the changing and diversified international landscape of ocean finance, where more traditional ODA support is accompanied by new and emerging actors and financing tools, mapping its impact on local blue growth in developing countries is challenging. In combination with a large variety of needs and contexts in coastal and island states, an even more multifaceted picture is painted. Despite this complex reality some conclusions are provided by this study. Blue

growth relies not only on marine ecosystems but also on land-based institutions that ensure policy coherence, effectiveness, technical skills, well-functioning value-chains and contextual local understanding.

6.2 Recommendations

Based on results from the thematic review, the following recommendations regarding support for local blue growth are proposed.

1. Ensure that legal frameworks and policies affecting the blue economy are coherent and predictable.

Coherent and predictable laws and policies are necessary so stakeholders can understand the conditions in which they operate and can adapt to changes. These considerations are essential for willingness to invest in the blue economy. Ensuring legal protection of rights to access and utilise marine and coastal resources in line with sustainability principles is of paramount importance. Coherence of legal and policy frameworks must not be hampered by a lack of institutional coordination and excessive bureaucracy.

2. Support the development of well-functioning value chains for blue economy products and services.

Value chains that enable local blue businesses to sell their products and services to diverse and expanding markets are important factors for local blue growth. Opportunities should be created for local businesses to come into contact with potential buyers and improve their understanding of demand. It is important to ensure market openness and access of local businesses to diverse markets, including international ones when possible, as this tends to foster greater private-sector development and higher incomes. Facilitating access to capital for small businesses which are essential links in value chains could be part of that support. Adequate sustainability standards should be established and upheld for blue economy products and services.

3. Support the creation and development of organisations for blue growth in the local community.

The support should emphasise the bolstering of social capital by upholding social norms and values, and should help develop suitable leadership models and reliable administration. Community-based organisations can be a key factor, building cohesion, trust, solidarity and mutual support amongst community members as well as facilitating access to information and identification of new opportunities.

4. Appreciate the importance of high-quality leadership.

Effective governance is strongly linked to the quality of leadership. Leadership needs to be dynamic and engaged, and to bridge the gap between communities and other levels of government. Leaders need to be accepted and legitimised by those who are governed. They must engage the community affected in exploring and realising new paths for development. High-quality leadership must be supported by reliable administration.

5. Local communities must engage in decisions affecting blue growth.

Adapting policies and interventions to the local context and understanding the local implications of laws are of paramount importance for local blue growth. Engaging representatives of local communities in decisions affecting their lives is necessary for the social, economic and environmental sustainability of any such measures. Due consideration must be given to the needs and priorities of the populations affected. Communicating the purpose and effects of decisions to stakeholders is necessary for acceptance and compliance. Knowledge exchange between the different levels should form the basis of evidence-based policy-making.

6. Enhance the capacity and technical skills of individuals and institutions of the blue economy.

It is particularly important to focus on the capacity for development of the blue economy and improvement of coastal communities' resilience at local level. Capacity-strengthening should encompass issues such as regulatory and administrative capacity, enforcement and compliance, and business-oriented capacities. Facilitating access to credit for small coastal businesses might be a necessary component of the capacity-strengthening. At all levels it is necessary to provide resources for adequate enforcement of laws and policies affecting the blue economy. To this end, the possibility of sharing enforcement responsibilities with local community organisations should be considered.

7. Provide and maintain the infrastructure necessary for local blue growth.

The prosperity and sustainability of blue businesses depend on access to infrastructure of various kinds. Public bodies are usually in charge of transport and market infrastructure, whereas productive and financial infrastructure is often provided by private actors. Public bodies may nonetheless play an important role in facilitating access to the latter types of infrastructure. Responsible parties should ensure not only that infrastructure be acquired, constructed and accessible but also that it be maintained.

8. Build local blue growth using the whole toolbox.

Social and economic systems are complex, and ecosystems can be fragile. Because of the many interdependencies amongst institutional and infrastructure factors, each of these recommendations for advancement of local blue growth should not be viewed in isolation. For an enabling environment to develop, all or most of the facilitating components need to be in place at the same time.

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Appendix 1 – Methodology

The study methodology involved the sequence of steps illustrated in Figure . This appendix provides a description of each of these steps.

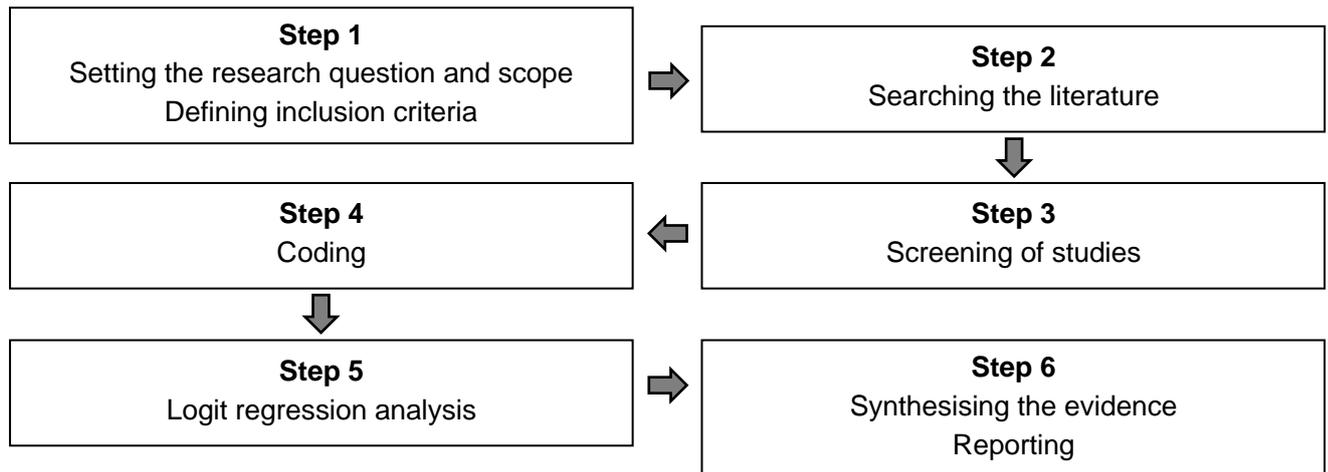


Figure 1 – Outline of steps in the methodology

Step 1 – Research question, scope and inclusion criteria

The research question guiding the study is:

What are the key institutional and infrastructure factors that promote local blue growth deriving from the use of marine resources in developing countries?

The following elements define the thematic scope of the study:

Population: Coastal communities in developing countries included in the OECD-DAC list of overseas development assistance (ODA) recipients.⁴ For the purpose of this study a coastal community is defined as a group of people and households occupying a geographically defined space characterised by specific functions strongly linked to the use of marine or inland aquatic resources by community members. Such functions relate to the economy, socialisation, social control, social participation and mutual support.

Intervention: Any general characteristic, tradition or specific event or process, including policies and infrastructure developments affecting the use of marine resources.

⁴ <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/dac-list.htm>. Last accessed on 10 March 2021.

Outcomes of interest: Changes in the economic wellbeing of coastal communities instigated by the intervention.

The primary literature surveyed in the study includes papers published in peer-reviewed scientific journals. Papers in the following languages were considered for inclusion: Danish, English, French, German, Norwegian, Portuguese, Spanish and Swedish.

The following inclusion and exclusion criteria were defined, based on the thematic scope of the study:

Population

- *Inclusion:* Studies focusing wholly or partly on coastal communities in countries included in the OECD-DAC list of ODA recipients.
- *Exclusion:* Studies not focusing on countries included in the OECD-DAC list of ODA recipients.
- *Exclusion:* Studies not focusing on coastal communities.

Intervention

- *Inclusion:* Studies focusing on one or more of the following infrastructure or institutional factors:
 - Infrastructure: transport; water and sanitation; housing; energy; communication; productive equipment; financial infrastructure
 - Institutional: governance of tenure; resource management; social development; education and training; employment and decent work: value chains, post-harvest and trade; gender equality; disaster risks and climate change; policy coherence, institutional coordination and collaboration; information, research and communication; social security; rule of law
- *Inclusion:* Studies focusing on any of the following sectors, representing uses of marine resources: marine fisheries; small-scale marine fisheries; inland fisheries; tourism; aquaculture; exploitation of minerals; maritime transportation and ports; environmental conservation; offshore energy production.
- *Exclusion:* Studies not focusing on any of the infrastructure and institutional factors listed above.
- *Exclusion:* Studies not focusing on any of the maritime sectors listed above.

Outcomes:

- *Inclusion:* Studies focusing on one or more of the following drivers of economic wellbeing (based on Summers et al, 2012 and OECD, 2013): Income and wealth; employment; public and household infrastructure; economic diversity; sustainability; cost or profit of education; trade; non-paid work.
- *Exclusion:* Studies not focusing on any of the drivers of economic wellbeing listed above.

Step 2 – Searching the literature

A search by keywords was performed on the Clarivate® Web of Science⁵ on July 10th 2019 based on the inclusion criteria mentioned above. The search was conducted for the entire time span (1975-2019), all citation indexes (SCI-EXPANDED, SSCI, A&HCI, ESCI) and all document types, and using all the Web of Science Core Collection languages available. The following search string was used:

TS=(Afghanistan OR "Democratic People's Republic of Korea" OR Armenia OR Albania OR Angola OR Zimbabwe OR Bolivia OR Algeria OR Bangladesh OR "Cabo Verde" OR "Cape Verde" OR "Antigua and Barbuda" OR Benin OR Cameroon OR Argentina OR Bhutan OR Congo OR Azerbaijan OR "Burkina Faso" OR "Côte d'Ivoire" OR Belarus OR Burundi OR Egypt OR Belize OR Cambodia OR "El Salvador" OR "Bosnia and Herzegovina" OR "Central African Republic" OR Georgia OR Botswana OR Chad OR Ghana OR Brazil OR Comoros OR Guatemala OR China OR "Democratic Republic of the Congo" OR "Democratic Republic of Congo" OR Honduras OR Colombia OR Djibouti OR India OR "Cook Islands" OR Eritrea OR Indonesia OR "Costa Rica" OR Ethiopia OR Jordan OR Cuba OR Gambia OR Kenya OR Dominica OR Guinea OR Kosovo OR "Dominican Republic" OR "Guinea-Bissau" OR "Guinea Bissau" OR Kyrgyzstan OR Ecuador OR Haiti OR Micronesia OR "Equatorial Guinea" OR Kiribati OR Moldova OR Fiji OR Lao OR Mongolia OR Macedonia OR Lesotho OR Morocco Gabon OR Liberia OR Nicaragua OR Grenada OR Madagascar OR Nigeria OR Guyana OR Malawi OR Pakistan OR Iran OR Mali OR "Papua New Guinea" OR Iraq OR Mauritania OR Philippines OR Jamaica OR Mozambique OR "Sri Lanka" OR Kazakhstan OR Myanmar OR Swaziland OR Lebanon OR Nepal OR Syria OR "Syrian Arab Republic" OR Libya OR Niger OR Tajikistan OR Malaysia OR Rwanda OR Tokelau OR Maldives OR "Sao Tome and Principe" OR "São Tomé e Príncipe" OR Tunisia OR "Marshall Islands" OR Senegal OR Ukraine OR Mauritius OR "Sierra Leone" OR Uzbekistan OR Mexico OR "Solomon Islands" OR "Viet Nam" OR Vietnam OR Montenegro OR Somalia OR "West Bank and Gaza Strip" OR "West Bank" OR "Gaza Strip" OR Palestine OR Montserrat OR "South Sudan" OR Namibia OR Sudan OR Nauru OR Tanzania OR Niue OR "Timor-Leste" OR "Timor Leste" OR "East Timor" OR Palau OR Togo OR Panama OR Tuvalu OR Paraguay OR Uganda OR Peru OR Vanuatu OR "Saint Helena" OR Yemen OR "Saint Lucia" OR "St. Lucia" OR Zambia OR "Saint Vincent and the Grenadines" OR "St. Vincent and the Grenadines" OR Samoa OR Serbia OR "South Africa" OR Suriname OR Thailand OR Tonga OR Turkey OR Turkmenistan OR Venezuela OR "Wallis and Futuna")

AND
TS=(community OR communities OR community-based)

AND

TS=(fishing OR coastal OR fisheries-dependent OR aquaculture OR mariculture OR "culture fisheries" OR "coastal tourism" OR "marine tourism")

AND

⁵ <https://apps.webofknowledge.com>, last accessed on 17 March, 2021.

TS=(wealth OR income OR jobs OR job OR employment OR unemployment OR capital OR revenue)

Step 3 – Screening of studies

Using the inclusion and exclusion criteria defined in Step 1, one team member screened the titles of the papers retrieved in the search in Step 2. The selected papers were uploaded to Mendeley Reference Manager software, where the same team member performed an initial screening of paper abstracts. The papers were divided into three groups based on their eligibility for inclusion in the subsequent steps of the analysis: ‘reject’, ‘accept’ and ‘in doubt’. The abstracts of the papers in the latter category were subsequently reviewed independently by three other team members. Differences between the team members’ assessments were resolved at a meeting, after which a list of papers accepted for full-text review was elaborated. Figure 2 illustrates the different stages of the screening process.

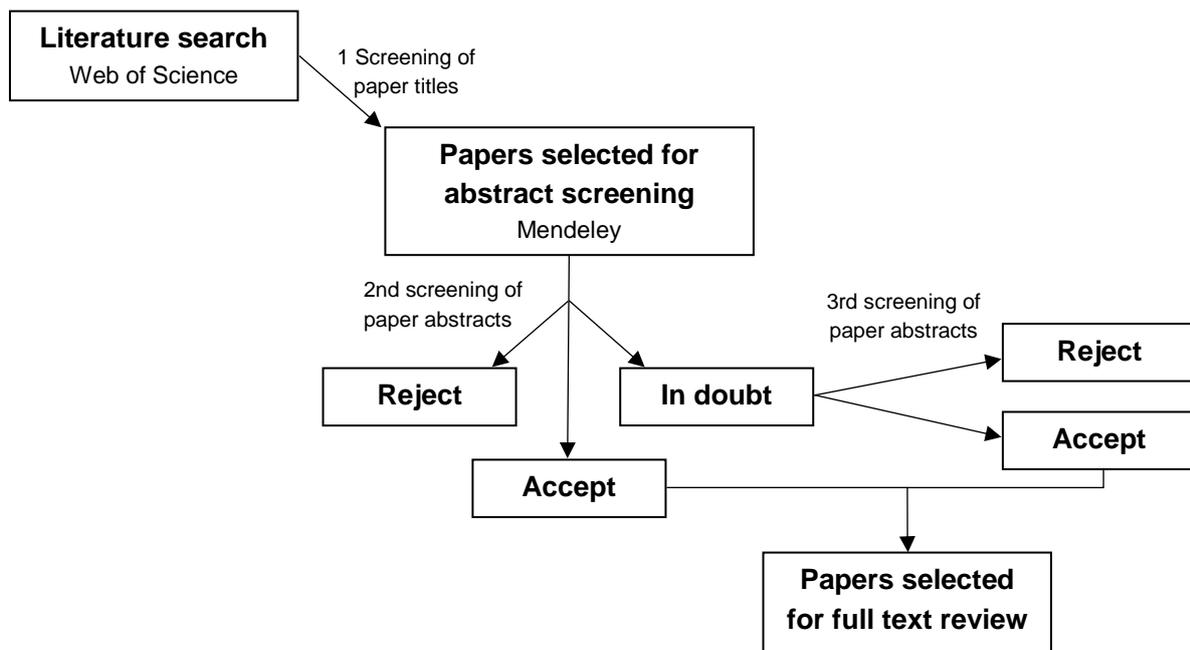


Figure 2 - Outline of the screening stages

Step 4 – Coding

The papers selected for full-text review were imported into the ATLAS.ti Qualitative Data Analysis software for coding. The coding framework was developed based on the thematic elements of the study (cf Step 1). To ensure consistent coding, the team members elaborated and adopted common definitions of key terms. Table 3 presents the code groups, codes and code definitions employed.

The study team tested the coding framework prior to use in a coding workshop in autumn 2019. For the test, four team members coded an initial paper together, and two additional papers separately. The team then reviewed the outcomes of this latter coding and performed the necessary adjustments to the framework. The papers selected for full-text review were distributed amongst the four team members for individual coding. Any subsequent issues related to the coding procedure were discussed by the team and solved on a case-by-case basis.

The entire text of the papers was coded, with the exception of the abstract. Coded passages were stored in ATLAS.ti for later analysis. Elements necessary for the mapping of the literature were later retrieved onto a Microsoft Excel worksheet. These elements included full reference, region, country, year of publication and sector. The literature map is presented in [Chapter 4.1](#). A number of studies retained for the coding were removed after the full-text review for not fulfilling the inclusion criteria.

Code group and codes	Definition
<i>0. Previous research</i>	
0.1 Previous research	Reference to previous research contained in other studies
<i>1. Data collection</i>	
1.01 Interviews	Codes relative to the data-collection methodologies employed in the study
1.02 Participant observation	
1.03 Register data	
1.04 Remote observation	
1.05 Text analysis	
1.06 Household survey	
<i>2. Sector</i>	
2.01 Marine fisheries	Codes relative to the sector(s) covered in the study
2.01.1 Small-scale marine fisheries	
2.02 Inland fisheries	
2.03 Tourism	
2.04 Aquaculture	
2.05 Exploitation of minerals	
2.06 Maritime transportation and ports	
2.07 Environmental conservation	
2.08 Offshore energy production	
<i>3. Infrastructure and institutional factors</i>	
3.01 Governance of tenure	<ul style="list-style-type: none"> recognising and protecting legitimate tenure right granting preferential and equitable access and use addressing competing and conflicting resource uses
3.02 Resource management	<ul style="list-style-type: none"> promoting practices and policies for sustainable resource use enhancing stakeholders' capacity for sustainable resource management developing and enforcing effective monitoring, control and surveillance systems

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Code group and codes	Definition
	<ul style="list-style-type: none"> developing effective co-management arrangements
3.03 Social development, education and training	<ul style="list-style-type: none"> developing the human-resource capacity of fisheries and aquaculture workers and their communities diversifying livelihoods ensuring access to education for the community's children and young people
3.04 Employment and decent work	improving working conditions and safety for fisheries and aquaculture workers
3.05 Value chains, post-harvest and trade	<ul style="list-style-type: none"> capacity of community members to benefit from market opportunities improving the value chain for fisheries and aquaculture products minimising the adverse impact of trade on fisheries, aquaculture and the community
3.06 Gender equality	mainstreaming gender equality as an integral part of community development
3.07 Disaster risks and climate change	addressing the impact of natural and human-induced disasters and climate change on fisheries, aquaculture and the community
3.08 Policy coherence, institutional coordination and collaboration	<ul style="list-style-type: none"> adoption and enforcement of policies and laws supporting sustainable marine-resource use mechanisms for institutional coordination and collaboration across different levels
3.09 Information, research and communication	<ul style="list-style-type: none"> knowledge of socioecological system access to information for decision-making
3.10 Social security	<ul style="list-style-type: none"> employment guarantees access to healthcare, incl. health insurance union rights
3.11 Rule of law	<ul style="list-style-type: none"> authority and influence of law in society role and reach of judiciary powers balance between the different powers of the state
3.12 Political regime, liberties and rights	<ul style="list-style-type: none"> electoral processes political pluralism and participation in decision-making freedom of expression and belief association and organisation rights personal autonomy and individual rights
3.13 Infrastructure – transport	Infrastructure for transport
3.14 Infrastructure – water & sanitation	Infrastructure for water and sanitation
3.15 Infrastructure – housing	Housing infrastructure
3.16 Infrastructure – energy	Infrastructure for energy production and distribution
3.17 Infrastructure – communication	Infrastructure for communication
3.18 Infrastructure – productive equipment	Public and private infrastructure for economic activities
3.19 Infrastructure – financial	Infrastructure and organisations for the provision of financial services
3.20 Foreign direct investment and external business investment	Investment by international partners and domestic business investors

Code group and codes	Definition
<i>4. Direction of factor</i>	
4.01 Presence of factor	Situation in which the presence of any of the infrastructure and institutional factors (Code Group 3) is linked to any driver of economic wellbeing (Code Group 5).
4.02 Absence of factor	Situation in which the absence of any of the infrastructure and institutional factors (Code Group 3) is linked to any driver of economic wellbeing (Code Group 5).
<i>5. Driver of economic wellbeing</i>	
5.01 Income and wealth	Changes in the level of income or wealth of individuals and the community
5.02 Employment	Changes in the level of employment or productivity
5.03 Public and household infrastructure	Changes in the number, type or quality of public or private infrastructure. In the latter case only relevant if it benefits the community.
5.04 Economic diversity	Diversification of economic activities within the community. May or may not be associated with changes in income, wealth and employment.
5.05 Sustainability	Changes in systems or processes affecting environmental, social or economic sustainability within the community.
5.06 Cost / Profit of education	Effects in terms of access to education or the cost/benefit ratio for education.
5.07 Trade	Changes in the degree of participation in trade activities. May or may not result in changes in income, wealth and employment.
5.08 Unpaid work	Changes in the degree of participation in unpaid activities such as childcare, care for the elderly, voluntary community engagements etc.
<i>6. Direction of outcome</i>	
6.01 Positive outcome	Infrastructure or institutional factor has a positive effect on driver of economic wellbeing.
6.02 Neutral outcome	Infrastructure or institutional factor does not have any effect on driver of economic wellbeing.
6.03 Negative outcome	Infrastructure or institutional factor has a negative effect on driver of economic wellbeing.
6.04 Inconclusive	Insufficient evidence for a conclusion on effect.

Table 3 – Code groups, codes and code definitions

Step 5 – Logit regression analysis

Logistic (Logit) regression was used to identify statistical correlations between factors⁶ and outcomes⁷ for response variables. It provided the basis for the synthesis and reporting step by identifying the ‘factor outcome’ pairs with a statistically significant correlation (cf Step 6). Logit regression is a way of quantitatively analysing data using a binary logistic model, where the dependent variables (here: factors) have only two possible values, e.g. present or non-present.

⁶ Factors are listed as Code Group 3 in Table 3.

⁷ Outcomes are listed as Code Groups 5 and 6 in Table 3.

Several factors can be analysed together, to reveal their combined effect on the independent response variable (here: driver of economic wellbeing). In essence, logit regression tests whether a binary outcome is correlated with one or several factors (Walsh 1987; Lipovetsky 2015).

Logit regression was deemed suitable for this study because only the presence or non-presence, but not the magnitude, of each driver of economic wellbeing could be extracted from the literature. Hence regression analyses with continuous outcome values were not justified.

The analysis was conducted on coded cases extracted from the literature. A case is an identified causal chain including all code groups (1-6) in Table 3, representing the findings from a specific reviewed paper. Each paper may only contain one case explaining the same causal relationship. Cases based on previous findings (Code Group 0 in Table 3) were removed in order to avoid double counting and unverified data. Data collection methods were included (code group 1).

The following preparatory and analytical steps were conducted:

- i. Cases based on rare sectors ($N < 5$) were removed. Cases ($N = 342$) were sorted into individual sectors (code group 2) and the combination of all sectors.
- ii. For each remaining sector and the combination of all sectors the most common (> 20) drivers of economic wellbeing (Code Group 5) were selected as independent response variables, including both positive (Code 6.01) and non-positive (Codes 6.02 and 6.03) outcomes of the response. Cases with inconclusive outcomes were removed.
- iii. For each remaining sector and the combination of all sectors the most common factors were selected, keeping a maximum of factors corresponding to the square root of the number of cases (\sqrt{N}) used in each analysis. Factors include both the presence (Code 4.01) and the absence (Code 4.02) of each specific factor, based on the reviewed literature.
- iv. Logit model regressions were computed using Statistica v13 by TIBCO Software Inc. Analyses and interpretation of results were in accordance with the software manual and certified training modules.
- v. The Hosmer-Lemeshow (H-L) analysis for Goodness of Fit was performed, disregarding regression models with significant H-L values.
- vi. Results with model explanations < 50 percent in any direction (present/non-present) were disregarded.
- vii. Factor-specific p-values ≥ 0.05 were considered non-significant.
- viii. Results were interpreted on the basis of H-L values, model explanation and odds ratio and probability (indicating how much the factors increase the likelihood of a given response), and factor-specific p-values.
- ix. Results include both direct evidence and indirect evidence of correlation. Direct evidence is when the *presence* of a significant factor is correlated (positively or negatively) with the outcome. Indirect evidence is when the *absence* of a significant factor is correlated (positively or negatively) with the outcome.

The results of the logit regression analysis are presented in [Chapter 4.2](#).

Step 6 – Synthesis and reporting

The last step comprised the analysis and synthesis of the data, and the production of the literature map and thematic synthesis. Reports were generated in ATLAS.ti for each of the ‘factor outcome’ pairs for which a significant positive or negative correlation had been established in the logit regression in Step 5. These pairs are shown in Table 4.

Sector	Infrastructure & institutional factor	Driver of economic wellbeing
All sectors combined	Policy coherence, institutional coordination and collaboration	Sustainability Employment Income & wealth Economic diversity
	Resource management	Sustainability Income & wealth
	Value chains, post-harvest and trade	Income & wealth
	Social development, education and training	Income & wealth
Small-scale marine fisheries	Policy coherence, institutional coordination and collaboration	Income & wealth
	Social development, education and training	Income & wealth

Table 4 – ‘Factor outcome’ pairs for which a statistically significant correlation had been established in the logit regression analysis

The mechanisms through which factors affect drivers of economic wellbeing were extracted from the ‘factor outcome’ reports. The mechanisms and factors common across reports were aggregated and used to structure the synthesis reported in Chapter 4.3.

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