Canada's Ocean Supercluster: Brief Notes to its Analysis

Sónia M. Goulart

Nova School of Law

smgoulart@gmail.com

Abstract

Canada's Ocean Supercluster was launched in the early 2018, by the Federal Government, aiming to define a strategy able to support innovation and economic growth from coast-to-coast-to-coast.

Canada has the largest coastline in the world and, along with it, many subsea resources and a highly productive ecosystem. Therefore, conditions are met for the engagement of experts in ocean technology and the search for innovative solutions, in what sustainability, job creation, and competitiveness are concerned.

Canada's Ocean Mega-Cluster was launched as an industry-led transformative cluster model. Canada's Ocean Supercluster is an innovative cluster, designed by the Government to promote Ocean economic growth, by involving all interested parties into a large-scale technology-focused plan.

To achieve this goal, Canada's Ocean Supercluster is funded by both public and private entities, in equal shares. It also integrates all type of members, from small to large organisations, from individuals to local communities (including Indigenous Communities), small and medium enterprises (SME) to big companies, and universities. Each one can have a main role and contribute to improve maritime economy.

From all the above, Canada's Ocean Supercluster is a praiseworthy initiative, that can be replicated across the globe, as it recognises and values the initiative of all seeking to leverage the ocean economy, with contributions from across all the country.

Keywords: Clusters, Development, Economics, Innovation, Ocean

1. Introduction

Canada is an extremely large country, with the World longest coastline and the fourth larger ocean area. Having it in mind, in 2018, the Canadian Government assigned priority to marine and maritime industries economic growth.

One of these measures was the launch of the 'Ocean Supercluster', with the aim to place the country at the global forefront. The watchwords are 'collaboration', 'networks', and 'global approach'.

The sustainable development of Canada's ocean economy represents a pivotal opportunity of our era. Projections indicate that by 2030, the ocean economy will grow 20% faster than the broader economy. Additionally, it has been estimated that the ocean can contribute up to 35% of the emissions reduction needed by 2050. With the world's longest coastline, the fourth-largest ocean territory, abundant resources, and a highly innovative population, Canada is uniquely positioned to take the lead in this area (Canada's Ocean Supercluster, 2024).

2. Methodology

For this paper, research was made from various websites, scientific (namely economic) papers, documents and discussions related to Canada's Ocean Supercluster.

3. Literature review

3.1 Cluster

The history of cluster research is deeply intertwined with classical economic theory. Adam Smith's 1776 concept of the "invisible hand" guiding domestic industry towards prosperity has been highly influential. While Smith's ideas laid the groundwork for location theory (Pinto, 1975), he is not formally recognized as a contributor to modern industrial cluster theory. Nevertheless, his influence is evident. The consolidation of regional interests leads to mutual benefits, and collective prosperity steered by unseen forces.

Following Smith, von Thünen's (1826) work laid the foundation for agglomeration theory. His model, focused on commodity shelf life, established a structure involving perfect competition and ceteris paribus modelling within a centralized activity hub and satellite ventures (Pinto, 1975). Key elements of this model include transportation costs and firm size, known as the Thünian system. Von Thünen himself acknowledged Smith's influence in his pioneering work (Clark, 1967).

Bridging location theory with industrial agglomeration, Alfred Marshall, the father of industrial cluster theory and a leading neoclassical economist, extended von Thünen's ideas. Marshall's (1920) concept of "economies of agglomeration" (local skilled labour pools, supplier linkages, and knowledge spillovers; cf. Potter & Watts, 2012) offers a robust framework for analysing industrial clusters. He famously noted that trade mysteries within an industrial locality are so pervasive that children learn them unconsciously. This aligns with how clusters operate - implicitly and effectively.

Paradoxes are inherent in contemporary industrial cluster theory. One such paradox is the "location paradox" (Porter, 2000), which highlights the critical importance of diverse regions in a globalized economy. Porter (2000) observed that "paradoxically, the most enduring competitive advantages in a global economy seem to be local". Industrial clusters provide a niche for localities to remain competitive globally, despite the apparent dominance of globalization. Clusters not only compete but often lead global industries creatively.

Modern research emphasizes the centralization aspect of clusters (De Langen, 2002), rooted in Christaller's work on spatial proximity and centralization (von Böventer, 1969). All modern aspects of the theory trace back to early economic principles, with strategic management now playing a crucial role in cluster theory's full development (Koliousis et al., 2019).

Maritime clusters are vital for regional and national economies, yet many aspects remain underexplored (Doloreux, 2017; Koliousis et al., 2018). Clustering is natural for maritime activities (De Langen, 2002), making them dynamic cases for both academic and practical

analysis. Established maritime clusters, namely those with regional potential, offer strategic management a solid base for regional competitiveness analysis (Chang, 2011). These clusters enhance innovation, crucial for regional competitiveness, supported by policy and acting as a catalyst (Doloreux & Shearmur, 2009).

Maritime clusters influence not only policy (Yin et al., 2018) but also regional strategy (Doloreux & Shearmur, 2018; Pinto et al., 2015). A key aspect of cluster research is the reconciliation of collective interests, with culture playing a significant role. Maritime clusters foster a culture of mutualism, promoting innovation and sustainability (Shinohara, 2010). This culture, akin to family dynamics, emphasizes continuous innovation and mutual support, bolstering competitiveness (Bjarnar, 2009).

Maritime clusters provide case studies for various analyses, from theoretical conceptualization to model formulation (Fløysand et al., 2012; Stavroulakis & Papadimitriou, 2017; Zhang & Lam, 2017). They inspire synergies among frameworks and models, yielding new methodologies for assessing cluster strength (Othman et al., 2011). Maritime clusters facilitate the exploration of industrial cluster dimensions, such as innovation (Pinto et al., 2018), and the development of innovation typologies (Makkonen et al., 2013). These clusters offer a rich domain for formulating and assessing empirical and theoretical methodologies (Pagano et al., 2016).

Maritime clusters are crucial for regional and national economies due to the maritime industry's dynamism. They provide a fertile ground for developing and accessing methodologies and instruments. Despite their unique features, commonalities persist across maritime clusters. Reviewing industrial cluster theory and examining geographical concentration highlight a fundamental, yet under-researched, aspect of agglomeration: the strategic factors affecting competitiveness within a cluster. Understanding these factors is essential for developing new maritime, as well as other clusters, contributing to wealth creation within regional economies.

Delving a little deeper into Michael Porter’s ideas, his Theory of National Competitive Advantage of Industries, known as the Diamond Model, is a model to analyse and explain

why international competitiveness in international markets is achieved only by some industries in a country. He identifies some factors that constitute the national environmental in which companies begin, develop and learn how to compete. The four main factors that leverage certain industries to continuous innovation and success are Firm Strategy, Structure and Rivalry, Factor and Demand Conditions and the Related and Supporting Industries. To these, two more factors, that were not in the original model, are added: the role of Government and of Chance. These two are relevant and worth to mention as they also have a relevant role in companies' competitiveness: the government "should encourage and push companies to raise their aspirations and move to even higher levels of competitiveness" (Bruin, 2018). Chance gets into the model as the translation of the effects caused by external events which might be a leverage to some companies and a hazard to others.

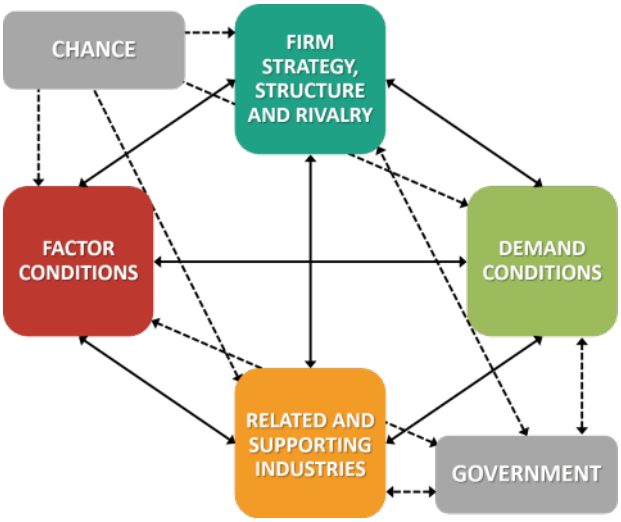

Figure 1 - Porter's Diamond Model of National Competitive Advantage. Source: Bruin, 2018

Table 1 - Porter's Diamond Model factors

Chance	Firm Strategy, Structure and Rivalry	Factor Conditions	Demand Conditions	Related and Supporting Industries	Government
- Random events - Natural disasters - Scientific break-throughs - Terrorist attacks	- Company strategies - Structure of the organization - Managerial system - Intense competition between local rivals	- Natural resources - Human resources - Capital resources - Infrastructure - Scientific knowledge - Technological innovation	- Size of the domestic market - Sophisticated and demanding domestic customers - Customer needs that anticipate those elsewhere	- Presence of competitive related and supporting industries - Domestic suppliers that are strong global players themselves	- Government policies - Industry regulation - Government role as a catalyst and a challenger

Source: Bruin, 2018

Regarding the cluster's development and competitiveness, collaboration and cooperation are crucial to its success. To better acknowledgement, we will refer, in just brief notes, to the models of innovation and its evolution over the years, considering the verified extensions.

The first model, developed by Michael Gibbons, was a linear model in which the university research was the key.

The second model, also theorized by Michael Gibbons, introduced five principles to the research to become problem-solved and context-driven: interdisciplinarity, heterogeneity, diversity within the organization; knowledge produced in the context of application; social accountability and reflexivity and quality control.

This evolution led to the definition of the Triple Helix innovation model, which was theorized in 1995 by Henry Etzkowitz and Loet Leydesdorff. Its objective is to emphasize a new network of the university, by adding the industry and the government.

The third model, developed by Elias G. Carayannis and David F.J. Campbell (2006) brought knowledge and innovation to the equation enhancing the importance of interdisciplinarity.

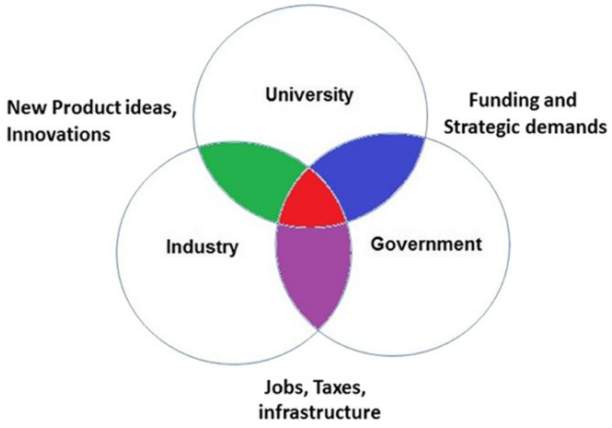

Figure 2 - Porter's Diamond Model of National Competitive Advantage. Source: Kimatu, 2016

And with this new design, emerged, in 2009, the *Quadruple helix* model, by Elias G. Carayannis and David F.J. Campbell, in which a new element is considered: the culture and civil society, directly tied to the innovation theme.

A new evolution of the model brought the *Quintuple helix,* designed in 2010 by EliasG. Carayannis and David F.J. Campbell. With this model, a special new axis appears: the natural environment, namely its sustainable development.

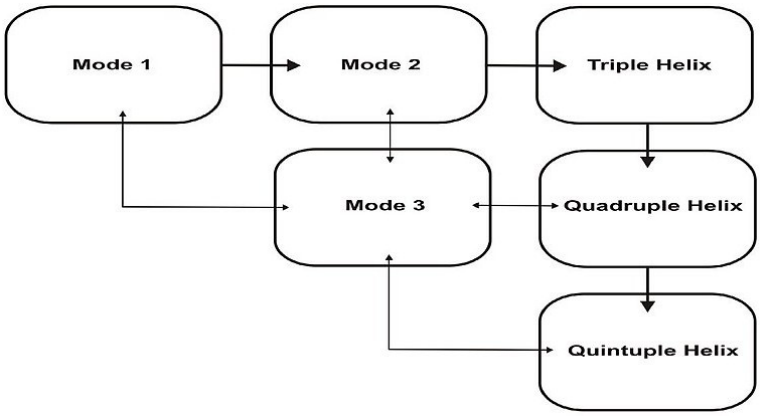

Figure 3 - The evolution of the models of knowledge creation. Source: Carayannis et al., 2016

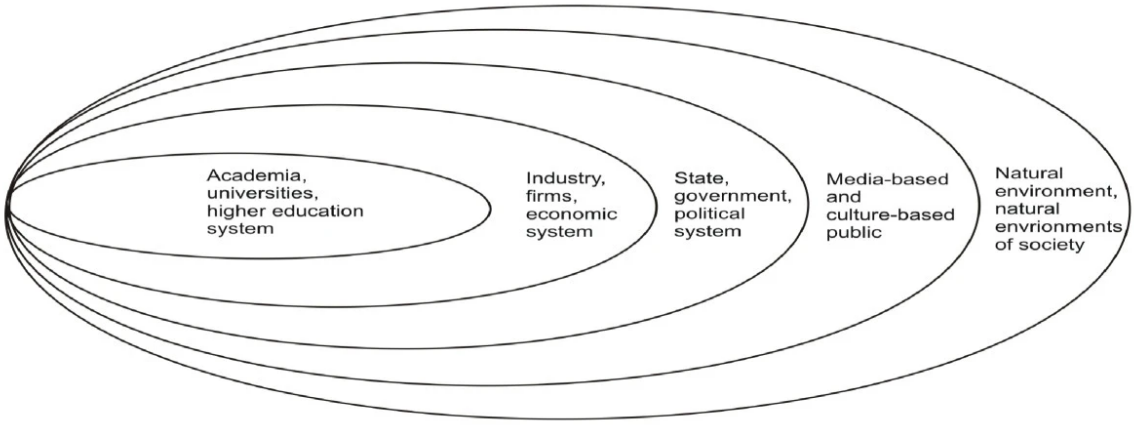

Figure 4 - The subsystems of the Quintuple Helix model. Source: Carayannis et al., 2016

Regarding the organisation of a cluster, it might adopt a formal or a semi-formal model, nevertheless, it always is a collaborative work, which may link the innovation with the economic development and, also, coordinate the cluster's activity in order to stimulate innovation and productivity of the stakeholders and to support emergent activities.

The structuring of a cluster has evolved over time. Today, from that evolution we can recognize various types of organisations, examples of which can still be found throughout the world.

The first ones corresponded to the aggregation of existing activities in a port services and shipping where the relationships were simple relationships between stakeholders. In this fase/type, the maritime cluster was not seen as a unit but just as several services working side by side. Dublin, in Ireland, is an example of this type of cluster organization.

In the next fase/type there is a hinterland of maritime sectors encompassing not only transport, but also industrial and commercial services needed within the port activity. By this, the allocation of cargo and general logistics is looking to add value to the services provided. Osaka port, in Japan, is a current example.

Going to the next step, we can identify a third fase/type of clusters, which responds to the boom in world trade occurred in the 1990's, that demanded more capacity of response from the supply chains and, therefore, from the transport sector, with maritime transport at the forefront of the response to market needs. At this point, maritime clusters are

already a hub of services with a crucial role within transport network. As an example, there is Rotterdam port.

Finally, the last fase/type brings us the result of the latest globalization by incorporating services provided by stakeholders that are physically far away. Here, there are several service centres, mirroring the vertical and horizontal integration adopted by maritime operators, each one providing a type of service, e.g., insurance, financing, ship registry. The core example is London, in where most of the services providers are based.

3.2 Supercluster

And what is a supercluster? A cluster of clusters?

A supercluster is described as an "innovation hotbed that hosts a robust industrial cluster or clusters, interconnected through their shared dependence on specialized inputs, including technologies, talent, and infrastructure" (Mackay, 2017).

In many ways, a supercluster can be seen as a cluster of clusters. The distinction between ‘cluster’ and ‘supercluster’ is somewhat ambiguous.

While clusters typically focus on specific industrial sectors and their immediate subcontractors (Isaksen, A., 2018), superclusters encompass the entire value chain, including related services, and promote the cross-fertilization of ideas and knowledge between seemingly unrelated sectors and encourage such cross-sector collaboration. This initiative seeks to build a competitive edge by attracting cutting-edge research, investment, and talent; increasing expenditures in research and development, and advanced technologies; supporting new companies, commercialization, and productivity; and amassing a critical mass of growth-oriented firms while strengthening collaborations between private, academic, and public sector organizations (Mackay, 2017).

The primary goals of a supercluster are to cultivate large-scale industry partnerships, supported by various innovation/innovative ecosystem players, and to encourage collaboration on ambitious market-driven proposals that inovate regional ecosystems. This, in turn, aims to boost the growth and competitiveness of participating firms while

maximizing economic benefits, such as creating well-paying jobs and fostering prosperity (Doloreux & Shearmuc, 2018).

For instance, in a maritime supercluster, industries as diverse as fishing, oil exploration, shipbuilding, computer simulation, and aviation might collaborate and share expertise in meteorology and sea condition prediction.

The supercluster concept is new and was designed in Canada. It encompasses and develops the idea of uniqueness. It is financed in equal parts by the government and the industry but its development involves companies, regardless its dimension, academics, researchers, non-profit organizations and the so called "accelerators and incubators" (Government of Canada, 2024).

The idea of a supercluster is to encourage large-scale projects, only achieved by collaboration between all stakeholders, that boosts industry's growth and, therefore, the economy, making them interesting for investment and for work.

A supercluster is based on several objectives:

- Connecting stakeholders and enhance their collaboration
- Attracting companies, research, talent and capital
- Innovation of processes and products
- Growth of industries, job offers
- Empowering companies to evolve and develop its businesses.

For all the above mentioned, a supercluster can be defined as "an innovation hotbed that is home to a strong industrial cluster, or clusters, linked through their shared reliance on specialized inputs, including technologies, talent and infrastructure" (Doloreux & Shearmur, 2018).

Indeed, a supercluster aggregates knowledge and investment, focusing on research and combining the synergies of different stakeholders to promote the development of an extended and collaborative chain of added value to leverage different projects, new and traditional, and, thus, contribute to the economic, technological development and competitiveness of the activities developed just as of the entire area.

4. Canada: History and Economy

Canada spans a vast area of 9.9 million square km, stretching from the Pacific to the Arctic and Atlantic oceans. This geographical reach is aptly captured in its motto, "from sea to sea." With a coastline measuring 243,791 km, Canada boasts the longest coastline of any country in the world, as highlighted on the map of Canada, Figure 5, (CanadaMap360º, 2024).

Figure 5 - Canada map. Source: CanadaMap360º, 2024

Canada consists of 10 provinces and three territories, with Ottawa serving as the capital. The provinces are Alberta (capital: Edmonton), British Columbia (Victoria), Manitoba (Winnipeg), New Brunswick (Fredericton), Newfoundland and Labrador (St. John's), Nova Scotia (Halifax), Ontario (Toronto), Prince Edward Island (Charlottetown), Quebec (Quebec City), and Saskatchewan (Regina). The three territories are: Northwest Territories (Yellowknife), Nunavut (Iqaluit), and Yukon (Whitehorse).

Canada is a vast country, stretching over more than half of the Northern Hemisphere from north to south, as depicted on the Figure 5. In many respects, Canada can be seen as a mosaic of many nations. Approximately half of its population consists of descendants of British and French immigrants, followed by subsequent waves of European and Asian immigrants. Indigenous peoples, known as First Nations, constitute about four percent of the population (CanadaMap360º, 2024).

4.1 Economic Regions

Canada's main geographic regions - Ontario, Quebec, the North, the West, and Atlantic Canada (Figure 6) - exhibit significant economic differences. These variations are shaped by each region's unique history of economic development, industrial location, urbanization, land use, and migration. (Polese et al., 2023).

Figure 6 - Economic Regions in Canada. Source: Polese et al., 2023

4.1.1 Geographic Advantages

Regional disparities in employment and wages can be partly attributed to comparative advantages of location. The first areas to develop, because of natural or historical advantages, will often continue growing as markets, institutions and infrastructures are created. The St. Lawrence River valley was first developed because of its unique

transportation advantage and agricultural potential. By building canals, roads and other infrastructure, settlers enhanced this initial natural advantage.

Before Confederation, the combined population of Quebec and Ontario were already considerably larger than the Maritimes province. Canada's internal market is small by world standards; one plant or office often serves the entire country. The centre of that market is situated in Southern Ontario and southwestern Quebec. Industries in the Maritimes and the Prairie Provinces are inadequately located for serving the Canadian market.

Modern industry and offices often require services, skills and infrastructure that can only be found in large cities and the Atlantic Canada possesses no major urban metropolis. Halifax is a small city by world standards. In the Prairies, the lack of waterways confounds the difficulty of reaching major markets and constitutes a special impediment to industrial development (Polese et al., 2023).

5. Canada's Ocean Supercluster

5.1 The Origins

Canada's Ocean Supercluster was launched in the early 2018 by the Canadian Federal Government aiming to discuss a strategy able to, on one side, to support the innovation and economic development and on the other to strengthen the ocean economy from coast-to-coast-to-coast. The idea was to, considering the large coastline, the highly productive ecosystem and the subsea resources, develop a research agenda leading to effective policies to develop Canadian economy, namely within the coastal areas, and, at the same time, to support maritime innovation. Therefore, launch an industry-led transformative cluster model able to leverage strengths and solve challenges by putting together investment, academy, science, Indigenous Communities and Government targeting the development of ocean economy.

Looking back to the beginning, Canada has three maritime clusters that reflected the reality of each area and its own development strategy (Table 2):

- British-Columbia's cluster, with a top-down strategy, started by the Government, targeting investment in big science and R&D to spawn self- sustaining activities
- Quebec's cluster focus was regional development
- St. John's and Halifax's cluster, located in a traditional fishing and shipbuilding region, decided to seize the opportunity and develop the off- shore oil activity, which could provide new opportunities to local workers and companies.

Table 2 - Canada's Regional Maritime Clusters

Region	Name	Location	Strategy	Focus
Pacific area	British-Columbia Pacific Ocean Technology Cluster	Vancouver island	Innovation	Marine technology
East of Canada	Quebec Maritime Cluster	Peripheral coastal areas	Regional development initiative	Support pre-existing maritime activities, through infrastructures and institutions
Newfoundland	Ocean Technology Cluster	St. John's and Halifax Cluster	Oil industry + Strong maritime traditions (fishing and shipbuilding)	Education and R&D; energy sector: remote sensing, data recording and communication products for ocean applications

Regardless of the core activities of each cluster, they all contribute to maritime knowledge, research and development and, therefore, to revitalize the existing maritime activities and to promote new activities.

Nevertheless, these accomplishments did not meet the expectations. So, in 2017, Canada's Government introduced a new agenda aimed to grow and accelerate innovations through supercluster initiatives.

In February 2018, Canada's Ocean Supercluster was selected as one of five superclusters and received $250 million to foster an innovation-driven ecosystem where firms across different ocean's chains values can connect to develop new technologies. This initiative also aims to implement a regionally focused program of cluster-building activities, enabling innovative companies from diverse marine-related sectors - such as marine renewable energy, fisheries, aquaculture, oil and gas, defence, shipbuilding, and transportation - to operate more efficiently by sourcing inputs and accessing information, knowledge, and technology. Canada's Ocean Supercluster will be concentrated in Atlantic Canada, a region considered to be one of the most promising in the world for establishing global leadership in the future ocean economy (Doloreux & Shearmuc, 2018).

In essence, Canada's Ocean Supercluster strategy is a publicly financed, industry-led initiative that connects business activities, science and research, and technology. It pursues five main objectives (Doloreux & Shearmuc, 2018).

> "*Strengthen links between ocean-based value chains and providers of enabling technologies*
>
> *Develop, deploy, and export innovative technology platforms applicable to multiple ocean industries*
>
> *Fill capability gaps in the innovation ecosystem through the attraction, recruitment, training, and retention of diverse, highly qualified personnel*
>
> *Extend the global reach, attraction, network and market opportunities for Ocean Supercluster partners*
>
> *Address global challenges related to sustainability, reducing carbon footprint and improving energy efficiency*." (Doloreux & Shearmuc, 2018, p.35)

To achieve its objectives, Canada's Ocean Supercluster employs two main strategies. The first strategy involves developing an innovation roadmap through collaborative projects known as Technology Leadership Projects. This approach focuses on large-scale collaborations among firms across different ocean-based chain values. The anticipated outcome is the development of new capabilities, leading to increased value creation from

Canadian ocean resources and the establishment of scalable global markets for intellectual property developed within the supercluster. This strategy aims to promote more ambitious technology projects, enhance lateral technology transfer opportunities, facilitate talent sharing, and attract new technology entrants into the ocean economy (Doloreux & Shearmuc, 2018).

The second strategy is to enhance the innovation and entrepreneurial capacity of the supercluster by funding and leveraging cluster-building activities that support collaborative projects. The goal is for Canada's Ocean Supercluster to be a dynamic and competitive system, rather than merely a geographical concentration of industries. This involves creating new programs and services to leverage financing, activate networks, build capabilities, and maximize the benefits of the critical mass of innovation and entrepreneurial capacity available in Atlantic Canada's ocean ecosystem. The targets include developing and attracting talented workers, fostering conditions that stimulate start-ups and scale-ups, providing access to innovation, technology, and commercialization, and connecting ocean stakeholders in Canada with their counterparts in Europe and the U.S.

In summary, Canada's Ocean Supercluster aims to create an innovation-driven ecosystem led by the private sector. This ecosystem fosters the creation of knowledge and technology through interactive learning and transfer within formal and informal networks. These networks connect SMEs, large companies, entrepreneurs, knowledge-generating and transmitting organizations, and innovation intermediaries. Additionally, technology leadership and cluster-building activities will enhance the innovation and entrepreneurial capacities of the supercluster. The ultimate goal is to support economic development and growth in Canada's ocean economy.

5.2 The Structure/Organization

The Canada’s Ocean Supercluster is ruled by a Board of Directors, which is chosen bi-annually, within industry leaders with different experiences and background. As such,

they should be able to provide strategic direction and to create synergies between its members, to enhance opportunities for a greater success.

A ’Senior Management Team’ is responsible for a five-year strategy, its implementation and reporting on results to the Board of Directors.

The number of members surpasses today 400, all across the county (and also abroad), each one committed to promote sustainable ocean growth, strengthen innovation ecosystems and solve ocean challenges. These members are as different as the activities, encompassing sectoral associations, indigenous organisations, non-profit organizations, small and medium sized companies, just to name a few of them (Canada’s Ocean Supercluster, 2024).

5.3 Vision and Mission

Its vision was summarized as: *‘Realize the potential of Canada’s ocean economy to establish and grow companies, achieve commercial outcomes, and engage in cross-sectoral collaboration*’.

Its mission was abridged as: ‘*To enable the sustainable growth of Canada’s ocean economy by building an* ecosystem *in which all members are well-connected andhave the capacity and capability to drive digital innovation”* (Canada’s Ocean Supercluster, 2022; p.2)

5.4 The objectives

‘CHANGING THE WAY OCEAN BUSINESS IS DONE’

(Canada’s Ocean Supercluster, 2024)

Canada’s Ocean Supercluster fosters partnerships and promotes innovative projects which intend to lead Canada to the forefront of world ocean economy development while leveraging the strengths to solve ocean challenges and promote ocean sustainability.

To do that, Canada's Ocean Supercluster promotes among its diverse areas of interest (fisheries, aquaculture, bioresources, or marine renewable technologies):

- industrial and regional development
- maritime competitiveness
- companies' innovation and productivity
- the emergence of new spheres of activity (Salvador, 2022).

5.5 The Stakeholders

The Canada's Ocean Supercluster is a supercluster, resulting from a Government initiative that aims to bring together all the potential players that can, not only contribute to the established objectives, but also take them further.

Here one must refer not only to the Government, but also Universities, companies, non-profit organisations or trade-unions. Always bearing in mind that there are several members and that each one contributes to the extent of their possibilities.

5.6 The Projects and Programs

Canada's Ocean Supercluster works by project, each dedicated to a specific subject and encompassing all the actors to leverage, enhance, and pursue the defined objectives. When talking about projects and programs, it is mandatory to refer to the following ones:

The Technology Leadership Program

This Program includes technological collaborative projects, aiming to bring together industries and associate members that share Canada's Ocean Supercluster challenges and priorities related to the ocean economy.

The main goals are as follows:

- reduce investment risks, by strengthening the links between stakeholders;
- develop innovative applications within industries and ecosystems.

The Innovation Ecosystem Program

"*An Innovation Ecosystem is a complex network of community stakeholders, with their capabilities functioning together, as a strategic economic development unit, critical for innovation and GDP growth*." (Canada's Ocean Supercluster, 2020; p.5).

This Program aims to guarantee shared resources access, regional connectivity, innovative culture, stronger links between small and large companies, and the creation of new supply chain partnerships. By these, attracting the best entrepreneurs to the cluster allowing to invest in ecosystem-building projects. Also important to refer are the new partnerships with Indigenous organizations.

The Indigenous Career Pivot Program

With the motto "Connecting Indigenous Peoples to the ocean economy", this program aims to facilitate mid-career work placements to Indigenous People. This includes a one-year program on board, to experience the work in maritime industries, enhance knowledge and develop skills, aptitudes and competences.

The Ocean Start-up Project

This project targets ocean tech businesses, industry and academia, aiming to promote project development and attract investment, allowing Canada to be the first choice to entrepreneurs, innovators, and start-ups.

5.6 The Financial Data

Financial data is crucial to the cluster's global analysis. Nine indicators were chosen in order to fully evaluate a maritime cluster:

- structural indicators
- economic indicators
- internationalisation
- critical mass and leader firms
- level playing-field; innovation

- institutional framework and business networks
- labour market and education
- and image and communication (Salvador, 2022).

These key performance indicators (KPIs) are used to analyse the economic strength of Canada's Ocean Supercluster. These KPIs are annually careful analysed by the Board of Directors to adjust the program strategies and project investments to the objectives achieved (Canada's Ocean Supercluster, 2021).

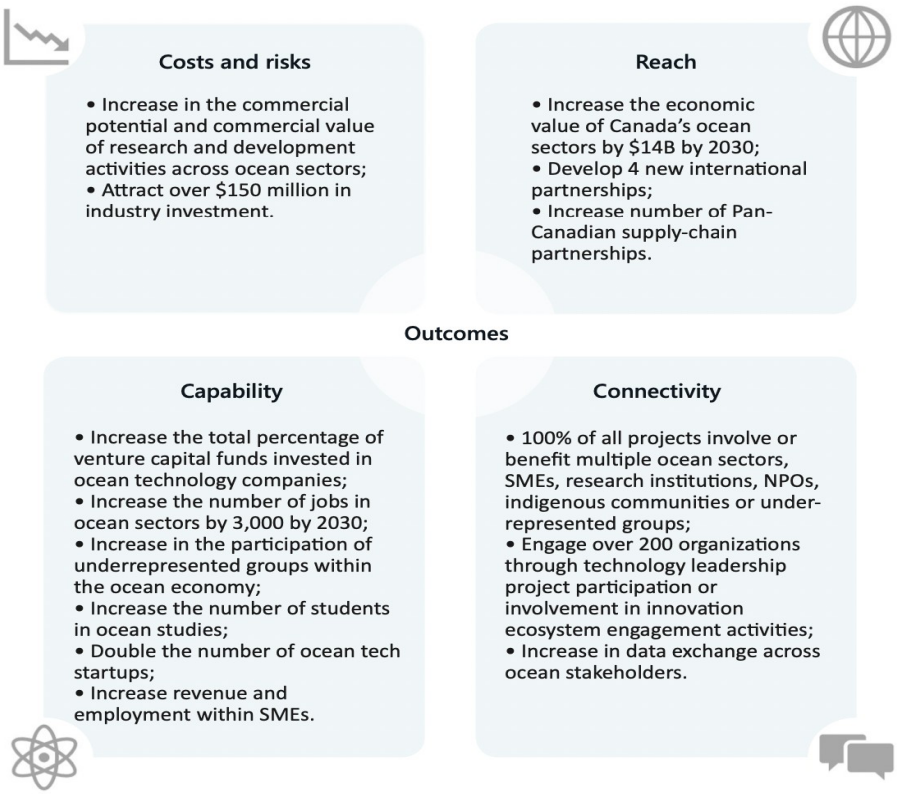

Figure 7 - Addressing shared challenges. Source: Canada's Ocean Supercluster, 2021

The funding for the Canada's Ocean Supercluster programs and projects is provided by public and private entities, thru a 1 to 1 partnership of public and industry funding. In total, over five years, the expected investment is of $950 million, having an expected GDP impact over 10 years of around $14 billion, while the global ocean economy is expected to be valued to $3 trillion by 2030. In the Strategic Plan 2018/2023, the projected

costs totalize $306,000,000, which are allocated to the Technology Leadership and Innovation Ecosystem programs, Figure 8.

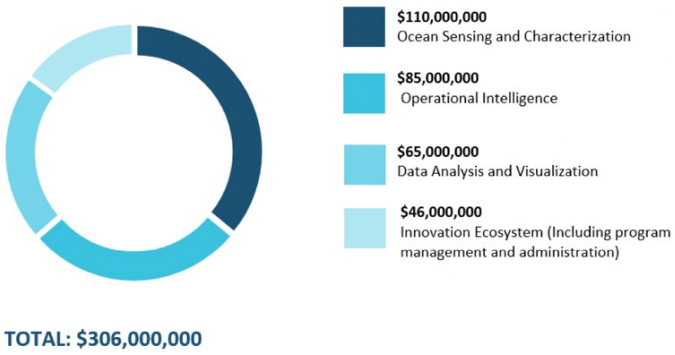

Figure 8 – Summary of Projected Program Costs. Source: Canada's Ocean Supercluster, 2021

Canada's Ocean Supercluster employs over 350,000 people and its contribution to the GDP is over $ 36 billion and growing. However, it accounts for just 1.5% of the National economy, much less than the 3.2% global registered average.

For the year 2022, in its Corporate Plan, Canada's Ocean Supercluster has planned to maintain over 50 projects. And expects to expand the collaboration network by building events, involving members more broadly and identifying potential new members.

6. Conclusions

Canada's Ocean Supercluster is an innovative cluster designed by the Canadian Government to promote the growth of the Ocean economy by involving all possible interested parties into a large-scale project aiming to put Canada at the forefront. The development of maritime activities that focus on technology as a mean to leverage innovation and develop economy-boosting activities is the base of the project. To do it, Canada's Ocean Supercluster is funded by public and private entities in equal shares.

It also fosters all members, from small to large scale, from individuals, local communities, including the Indigenous Communities, small and medium companies to big industries and universities, recognising that each one has an important role and contributes to the development of the maritime economy through innovative projects targeting sustainable blue development.

For all the above, Canada's Ocean Supercluster is a praiseworthy initiative that should be replicated across the globe, as it recognises and values the work and initiative of all seeking to leverage the ocean economy with contributions from across the country.

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