



Ísafjarðarbær



Háskóli Íslands



Vegagerðin

Title:

Flexible and Adaptive Port Planning, Case Study of the Port of Ísafjörður

Authors:

Majid Eskafi, Ali Dastgheib, Poonam Taneja, Guðmundur Freyr Úlfarsson, Gunnar Stefánsson, Ragnheiður Inga Þórarinsdóttir

Abstract

Today, the dynamic and ever-increasing complex nature of a port system creates a high degree of uncertainty, e.g., opportunities and vulnerabilities, in port development projects. Port layers (infrastructure, service, operation) are confronted with uncertain demands during their projected lifetime. The inability to adequately meet such demands can lead to costly adaptations or loss of cargo and the competitive position of the port. A port development project is a huge, risky and irreversible investment with a long-term return period. Hence, the final decision making is very challenging. The deterministic and static strategies in traditional port planning are an oversimplification in a volatile world with rapid systematic global changes. In order to deal with uncertainties, Adaptive Port Planning (APP) is increasingly being investigated. The APP is an approach that bridges the gaps in the traditional practice of port planning by incorporating uncertainty and flexibility. The APP accommodates diverse planning needs and delivers robust solutions without losing functionality to withstand the vagaries of the future.

This timely project applies APP to the third busiest port of call for cruise ships in Iceland, the multipurpose port of Ísafjörður (Hafnir Ísafjarðarbæjar). The APP process starts with a definition of success in terms of specific desired objectives held by port stakeholders. Reaching a consensus on the definition of success is not an easy task when a multiplicity of stakeholders with different influence and concern demand a wide range of objectives. Thus, to address the objectives in the planning and reconcile conflict and controversies, an extensive port stakeholder analysis was



Ísafjarðarbær



Háskóli Íslands



Vegagerðin

carried out in this project. The research dealt with a systematic procedure for stakeholder analysis, comprising identification and grouping of the port stakeholders, mapping the stakeholder groups and measuring their salience on the criteria of the port master planning. In this context, the port stakeholders were categorized into 5 groups based on the similarities in their roles, characteristics, interests, and influence on the project, including internal stakeholders, external stakeholders, legislative and public policy stakeholders, community stakeholders, and academic stakeholders. To capture all stakeholders' objectives, effectively balance their conflicting interests and ensure fairness in the whole planning process, an A-Z coherent qualitative and quantitative approach was elaborated. 51 interviews with all relevant port stakeholders were conducted and 314 values of port planning were identified. The values were used to set criteria of port planning by creating an appropriate harmony between them. 8 criteria of port planning were identified including competitiveness, land use, safety and security, hinterland connectivity, flexibility, environmental implications, economic and social impacts, and financial performance. The result not only discovered the criteria of port master planning to meet the objectives of all relevant port stakeholders, but also showed how they should be addressed in the planning process. The findings also revealed that competitiveness and land use form the dominant demand of the stakeholder groups. To recognize the interrelationship between stakeholders' attributes and assess their salience, dynamic stakeholder mapping was applied. The result demonstrated that who should be involved to the port master planning from the early stage and during the whole process, who has more salience and entitlements to a role now or might be enriched in the future. The results showed the significant roles and salience of the internal stakeholder group in all criteria of port master planning. However, the legislative and public policy as well as the external stakeholder groups, were found to have high potential to influence the port master planning process. Furthermore, fuzzy logic was used to enrich the decision-making process and facilitate achieving the final level of agreement between the key stakeholders aimed at reaching a consensus on the definition of port success. Finally, through a structured framework the definition of port success was formulated for



Ísafjarðarbær



Háskóli Íslands



Vegagerðin

an Icelandic port for the first time in the country. The exhaustive research done in this project makes the findings applicable to other similar projects.

In the next research step, we propose a nuanced analysis of national and international maritime transport and logistics as well as their future trends and developments. Extensive demand forecasting, capacity planning of infrastructure, cargo, intermodal connections and the connectivity of Icelandic ports are carried out. Required information such as economic and supply chain data, port functions, oceanographic and climate conditions, port structures and facilities (dry and wet areas) will be gathered during several field studies and from national and international sources. The data will be stored in a database and can be used for other similar projects by researchers and practitioners. Furthermore, the main uncertainties surrounding the Icelandic ports are identified. In order to “take advantage of new opportunities and minimize vulnerabilities”, the location, level, and nature of uncertainties will be analyzed. Various alternatives and planning strategies will be formulated based on the definition of port success and the identified uncertainties. Then, the required actions are shaped in the port planning process, in order to deal with uncertainties that might beset the Icelandic ports, in particular the port of Ísafjörður.