

## **IMPROVING THE IMPLEMENTATION OF MARINE AND FISHERIES TECHNOPARKS IN TEGAL, CENTRAL JAVA, INDONESIA USING BENCHMARKS FROM THE ICELANDIC OCEAN CLUSTER**

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### **ABSTRACT**

In 2015, the government of Indonesia planned the construction of 100 technology parks, spread over the whole of the country, of which 24 Marine and Fisheries Technology Parks (MFTP) were to be built in the period between 2015 - 2019. To establish a sustainable operation of the Tegal MFTP within four years, the study evaluates the implementation of the MFTP in Tegal, Central Java Province, Indonesia, using both a Project Cycle Management (PCM) and Benchmarking with the Iceland Ocean Cluster (IOC). The Tegal MFTP has been in operation since 2015. Comparing performance to targets over the first two years has called for improvements. In 2015, four incubator activities were started up at the MFTP. The Tegal MFTP has also carried out various other activities such as disseminating technical possibilities for innovation, organizing training and offering internship. Unfortunately, all but one incubator was discontinued in 2016, mostly due to delay of budgeted payments from government, inadequate technical assistance, and lack of stakeholder engagement. Based on PCM analysis and the result of benchmarking, the IOC's suggestions to improve the operational sustainability of the MFTP are presented. The suggestions cover various aspects for improvement regarding the operations for the Tegal MFTP and for the new MFTPs, both for those starting operations now and those still in the planning. These aspects include a financial support approach, a MFTP administrative approach, an innovative technology approach, and an incubator services approach seeking to improve the satisfaction of the participants/tenants.

This paper should be cited as:

Sabana, A. 2018. *Improving the implementation of marine and fisheries technoparks in Tegal, Central Java, Indonesia using benchmarks from the Icelandic Ocean Cluster*. United Nations University Fisheries Training Programme, Iceland [final project]. <http://www.unuftp.is/static/fellows/document/ady16prf.pdf>

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## 1 INTRODUCTION

Marine fisheries are of considerable importance to the Republic of Indonesia in terms of both quantity and value. Located mainly in Southeast Asia with some territories in Oceania, between the Indian and Pacific Ocean, it has a very high marine biodiversity. Although the marine environment is rich, the development in this sector has also experienced considerable challenges.

Empirical data show a correlation between scientific and technological capability with the progress of a country's economy. Although Indonesia's economic performance is relatively good, the contribution of technology to economic growth is still modest. Indonesia faces two significant constraints; (1) the limited investment in the downstream industries for processing raw or semi-finished materials into finished products, and (2) the immature state of national technology to support growth of the downstream industries (Ristek, 2011).

Faced with these problems, and in order to realize the vision to become a developed and prosperous country by 2025, the government launched the Master Plan for the Acceleration and Expansion of Indonesian Economic Development (MPAEIED) to accelerate economic transformation. The approach focuses on concrete and measurable priorities. One of the strategies in the implementation of MPAEIED is human resource capacity development and science and technology through the development of technology parks or "techno parks" in marine activities (Coordinating Ministry for Economic Affairs, 2011).

One of the main purposes of the development of techno parks is to address the problems faced by the fishing industry in Indonesia. Marine and fisheries SMEs<sup>1</sup> problems are commonly related to size, isolation, market opportunities, standards/quality, supply and value chains, logistics and technology innovation. As marine and fisheries SMEs vary widely in size, capabilities, environment (urban or rural based), and organizational structures, coherent region-wide approaches to address their problems have been difficult to craft.

In 2015, the government of Indonesia launched the construction of 100 technology parks spread over the whole country, and of which, 24 of Marine and Fisheries Technology Parks (MFTP) were to be built in the period from 2015 - 2019 under the Ministry of Marine Affairs and Fisheries (MMAF) of Indonesia. This program will involve universities, R&D institutions, the business and industry sector, fisheries training centres, supporting institutions, and society to work in synergy with each other. The MFTP is expected to be a forum to facilitate the application of science and technology into innovations that improve the competitiveness of marine and fisheries businesses and industries.

By 2016, only four of the 24 MFTPs had been established located in Tegal, Banyuwangi, Ambon, and Bitung. Several problems have been experienced in the establishment and operation of the MFTP therefore, it is important to evaluate the experience so far. The MFTP in Tegal was selected for this study. Suggestion for improvement was based on benchmarking with the Icelandic Ocean Cluster. The research questions of this study were:

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<sup>1</sup> SMEs: Small and medium scale enterprises

- 1) What problems have arisen during the implementation of a MFTP in Tegal, Central Java Province, Indonesia?
- 2) How can the implementation of MFTP in Indonesia, especially in Tegal, be improved based on PCM analysis and through applying benchmarking of the Icelandic Ocean Cluster?

The goal of the study was to find ways to improve the implementation process of the MFTPs in Indonesia in order to establish a sustainable operation of the techno parks under the local government.

The objectives of this study were:

- 1) To evaluate the implementation of MFTP in Tegal, Central Java Province, Indonesia, using Project Cycle Management (PCM) model.
- 2) To benchmark the Icelandic Ocean Cluster regarding the development strategy of human capacity building, community empowerment, research, science, and technology for the improvement of the Tegal Marine and Fisheries Techno Park.

The result of the study is expected to contribute to the development of MFTP in Tegal as well as be used as an input for formulating programs in developing an efficient and effective MFTP.

This study has limitations. Even though interviews were conducted with managers of MFTPs in Indonesia and secondary data of MFTPs collected and analysed, most of the reasoning used for the PCM analysis has been constructed on the perception of the author of this paper. This is especially true for the stakeholder analysis and the problem and objective analysis, where it would have been right to use the input from the group of managers. The same thing applies for the determination of the indicators in the LF matrix used in the PCM analysis, as normally a group of managers would establish such indicators.

## 2 BACKGROUND

This chapter is about the background of the Indonesian and the Icelandic fisheries and the background of the Tegal MFTP and the Icelandic Ocean Cluster.

### 2.1 Indonesian Fisheries

Indonesia is the world's largest island country with more than seventeen thousand islands. It has an estimated population of over 255 million people (BPS, 2015) and is the world's fourth most populous country. The mainland is about 1.91 million km<sup>2</sup>, with a coastline of 99.093 km (MMAF, 2015). This makes it the fourth longest coastline in the world and have a great potential for the development of marine fishery resources.

In 2014, Indonesia fisheries production amounted to 20.8 million tons, with capture fisheries contributing 6.5 million tons, and aquaculture 14.3 million tons (MMAF, 2015; Fishstat, 2016). Indonesian ranks second in the world after China with a total world contributing 7.3% marine capture production and 14.1% aquaculture (FAO, 2016). The Indonesian fishery production increased by 15.8% during the period 2010-2014, with capture fishery production increased by 4.8% and aquaculture production by 23.4% during the same period (MMAF, 2015).

In 2014, there were 2.74 million fishermen and 3.8 million fish farmers in Indonesia. The number of marine fishing vessels were 625,633, and over 85% of the vessels was less than 30 GRT. The value of the fisheries production in 2014 was 9.82 billion USD for capture fisheries and around 8.31 billion USD for the aquaculture sector. Fisheries and aquaculture contributed 3.25% to the country's GDP (MMAF, 2015).

### 2.2 Icelandic Fisheries

Iceland is located in the North Atlantic between Norway, Scotland and Greenland. It is the second-largest island in Europe and the third largest in the Atlantic Ocean, with a land area of some 103 thousand square kilometers, a coastline of 4,970 kilometers and a 200-nautical-mile exclusive economic zone (EEZ) extending over 758 thousand square kilometers in the surrounding waters. Iceland enjoys a warmer climate than its northerly location would indicate because a part of the Gulf Stream flows along the southern and western coasts of the country (Icelandic Fisheries, 2016).

Iceland is the 18th largest island in the world. The livelihood of the nation living on this island, positioned almost midway between Europe and America, is highly influenced by the sea. Iceland's ocean economic zone encompasses a wealth of natural resources; the three main resources are fisheries, renewable energy, and water (Iceland Ocean Cluster, 2012). The population of Iceland in 2016 was 338.540 (Statistics Iceland, 2017).

For Iceland, the fishing industry is a base industry, one where knowledge has been building up for over 100 years (Sigfusson & Arnason, 2012). Numerous other industries that serve the base industry have emerged. This provides a foundation for a diverse range of industries that may subsequently become considerably larger than the initial base industry. A base industry is notable for its overall economic effects over and above its direct effects (Joseph, 2014).

Fisheries is one of the cornerstones of the Icelandic economy. The direct contribution from fisheries and fish processing to the GDP has been 7–10% over the past few years. The sector employs around 8,600 people or approximately 5% of Iceland's workforce. A wide range of companies connected with the sector have gradually developed and these companies are responsible for supplying the sector with some services and take its products for further processing and distribution. The scope of these operations is substantial. On the scale of contribution to the GDP it is almost as great as the direct contribution of the fisheries sector itself (Iceland Ocean Cluster, 2011).

### **2.3 Marine and Fisheries Techno Parks in Indonesia**

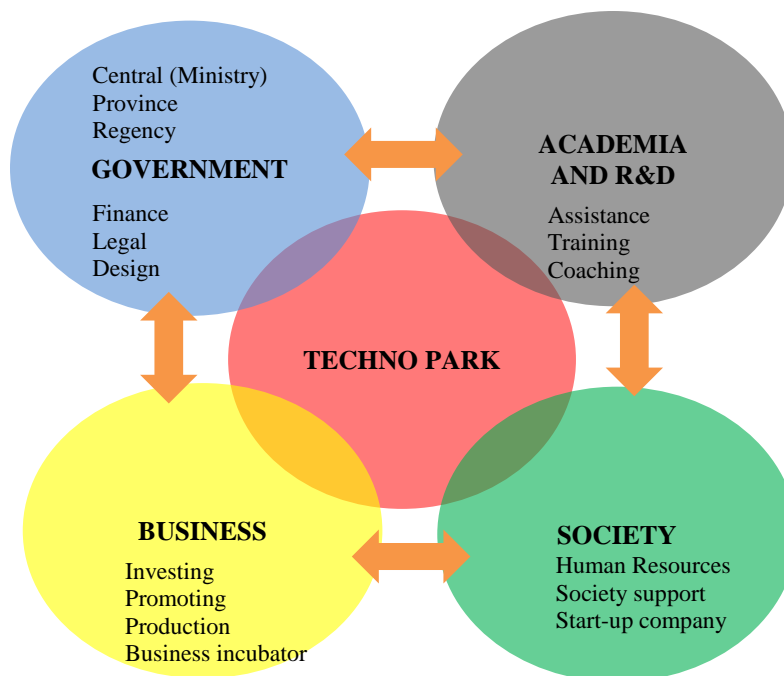
In 2015 the Indonesian president launched a national policy to improve the capacity of innovation and technology based on nine priority agendas. This goal is implemented through the establishment of 100 science and technology parks (STP). These programs are intended to strengthen the cooperation between the elements of innovation and to support economic development based on science and technology (Kemenristekdikti and ASTPI, 2015).

To support the national program for the development of 100 STPs, the government published several technical regulations such as the Grand Design for the Development of Science and Techno Park in Indonesia in the period 2015-2025 (Kemenristekdikti and ASTPI, 2015) partly shown in Appendix 1. A Road Map for Marine and Fisheries Techno Parks (Agency for MFHRD, 2015) partly shown in Appendix 2, and so was a Technical Guidance for Development of Marine and Fisheries Techno Parks (MMAF Team, 2015) partly shown in Appendix 3, as well as a Master Plan for the Development of Tegal Marine and Fisheries Techno Park (Tegal Training Center, 2015).

#### *2.3.1 The Tegal MFTP*

According to the master plan, the Tegal MFTP is expected to develop through interaction with both central and local government, R&D institutions, universities, businesses and industry, society, and other institutions (Figure 1).





**Figure 1: Stakeholder relational plan in Tegal MFTP**

According to the masterplan the stages of the development of the Tegal MFTP are:

- 1) In 2015, developing the institutional structure of the MFTP.
- 2) In 2016, building the infrastructure for incubators.
- 3) In 2017, business incubator with SMEs operating there.
- 4) In 2018, investor and industry are supporting and financing SMEs of the MFTP.
- 5) In 2019, operation of the MFTP transferred to the local government.

It is expected that by 2019, the Tegal MFTP will have become sustainable and transferred under the responsibility of local governments. Detailed information related to the master plan is partly displayed in Appendix 4.

The city of Tegal is strategically located for capture fisheries on the north coast of Central Java (Figure 2). The city plays an important role as a link between the northern regions and the southern part of Java Island. In accordance with Law No 32 of 2004 on Regional Government, the city of Tegal is given economic authority for the sea as far as four miles. Tegal has a coastline of 7.5 km with fishing activities dominated by marine fisheries with both inshore and offshore operations. The marine fisheries production value in 2015 was about USD 20.86 million with a production of around 27,451 tons. The brackish aquaculture production in 2015 was valued at about USD 564.6 thousand with a production of 500 tons. The freshwater fisheries production value in 2015 was around USD 34,211 with a production of 26.27 tons (BPS - Tegal, 2016).



**Figure 2: Map of Tegal City (Map of The World, 2016)**

Fish landed in Tegal is used as raw material for the processing industry in the city and major cities around it. Fish processing plays an important role in the Tegal economy. The purpose of the development of the Tegal MFTP is to improve the fish processing and value adding of marine and fisheries products. Furthermore, it is expected to facilitate new start-up companies with the help of incubators. Incubators are basically small facilities or demonstration units where interested entrepreneur can receive practical training in the use of new innovative technologies. Through an internship, entrepreneur can acquire knowledge and skills to establish a similar production or improve the production in comparison with what they have already established. In the long term, the program aims to improve the local economy and increase local revenues in Tegal and major cities around it.

### 2.3.2 Incubation activity of the Tegal MFTP

Availability of innovative technology is one of the requirements for the development of the MFTPs (Kemenristekdikti and ASTPI, 2015). Tegal MFTP under the management of the Tegal Training Centre, did work on a variety of innovations in 2015, such as the preparation of a gas conversion machine, the technology of backyard sea salt production, a mobile refrigerator, a water mill with energy savings, and a mini water mill.

From the various technological innovations worked on, it was decided in 2015 to use training for the dissemination of the technological activities. This way it would be possible to spread the technology to those in the community wishing to develop start-up businesses. The topics of the 2015 training sessions were sea salt production, rice-shrimp farming, intensive fish farming, Vannamae shrimp farming, and fish feed processing.

Business incubator activities that started in 2015 using the innovation and technologies already developed included:

a. Sea salt farming

The sea salt incubator-located in the village of Kaliwingi, Brebes Regency used the "screw shape filtering model and geomembrane methods" in salt production. Sea salt production was around 90 tons in the period from September to November 2015. The number of 20 tenants were incubated.

b. Rice-shrimp farming

The incubator of "Udang galah mina padi" or Rice-shrimp farming is located in Slawi, Tegal Regency. In October 2015, the incubator distributed the giant river prawn (*Macrobrachium rosenbergii*) fry and released into the rice farm fields. The number of five tenants were incubated.

c. Vannamae shrimp farming

The vannamee shrimp farming incubators is located in Tegal, Central Java. The number of four persons were incubated.

d. Intensive fish farming (Catfish bio flock)

The intensive fish culture incubator (bio flock method) is in Tegal, Central Java. It produced catfish, in a high-density culture. The number of 30 tenants were incubated.

Programs aiming to improve competitiveness of business are also a priority for the Tegal MFTP. The MFTP in Tegal facilitated a contract between tenants in sea salt farm and a buyer, Multi Colorindo Partners Ltd. According to the agreement, the tenant's salt production is to be sold to the company at a premium price in accordance with the quality of the sea salt produced. Unfortunately, there was only one incubator able to assist in the manufacturing of the product.

In 2015, short internship activities were offered to extension officers, students, and the public community. At the same time the Tegal MFTP management were designing the MFTP operational procedures, working on the masterplan, designing nameplates and logo for the techno park and incubators, and building the workshop.

For the Tegal MFTP implementation by 2016, of the four incubators established by the Tegal MFTP in 2015, only the sea salt production, located in Brebes Regency, was still operated in 2016. Fund for the tenants of the incubator for rice-shrimp farming did not arrive on time, and production of shrimp larvae were not synchronized with the rice cultivation cycle. Rent for Vannamae shrimp farming was not in time and these were not enough staff to operate the intensive cat fish farming.

## 2.4 Iceland Ocean Cluster

The Iceland Ocean Cluster (IOC) resides within the Ocean Cluster House, a business incubator and innovation hub housing 50 companies. Through Ocean Cluster House, the IOC is on a mission to drive growth and innovation in the marine industries by strengthening networks between people, businesses, and entrepreneurs (Iceland Ocean Cluster, 2017). IOC was established in 2012 as a cluster with 12 companies and an incubation centre. In April 2016, it had 45 business and 2 incubation centres in a 2,700 m<sup>2</sup> house.

The fisheries sector and the above related operations can overall be viewed as an industry cluster as defined by Porter (1990). The companies in this cluster are linked to one another in various ways and draw support from one another. The cluster is therefore economically more dynamic, more efficient, and more flexible than the simple sum of the companies that form it. One reason for this is the development of human resources and technology within the cluster which all the companies have access to through market trading, collaboration, and co-operation. The cluster, therefore, operates to some extent as a very large and diverse company without the administrative disadvantages that generally characterize such companies (Iceland Ocean Cluster, 2011).

The IOC is utilizing the potential of external economies of scale for SMEs and provides entrepreneur's access to various companies, organizations, consultants, and specialists within the cluster network. This has been incredibly valuable in creating business opportunities, facilitating technical development, and generating new spin-off companies, supporting the overall growth process of start-ups and SMEs. In this, connecting people with different backgrounds, skills and perspectives has been both critical and decidedly successful. The mission of the IOC is to create value in the ocean industries by connecting people and businesses (Iceland Ocean Cluster, 2017).

According to Joseph (2014) the IOC broadly follows Williams "Cluster Navigators" framework for cluster development. Cluster navigators are based on a five-phase, twelve step process as shown in Table 1.

**Table 1: Cluster Navigators Framework (Joseph, 2014)**

Phase A	Step 1: Introducing Relevance Step 2: Identifying, Prioritizing Clusters
Phase B	Step 3: Initial Analysis Step 4: Cluster Governance
Phase C	Step 5: Preferred Future Step 6: Initial Strategy Step 7: Short-term, Tactical Agenda
Phase D	Step 8: Formalizing and Launching Step 9: In-depth Analysis, Benchmarking
Phase E	Step 10: Long-term, Strategic Agenda Step 11: Linking the Cluster Step 12: Measurement and Evaluation

After the start of the IOC, the overall contribution of fisheries and related sectors in the ocean cluster was 27.1% of GDP in 2011, up from 26% in 2010 (Sigfusson & Gestsson, 2012). This can be further broken down into a direct contribution of 10.5% in 2011, a 5% increase since 2010, and an indirect contribution of 7.3% with a demand effect of 8.5% (Joseph, 2014). Turnover in the independent exports of these supporting sectors was estimated at 42 billion ISK in 2010 or 1.5% of the direct and indirect added value from the fisheries sector (Sigfusson & Arnason, 2012).

### 3 THEORY

Economic growth is defined as an increase in income per capita; this is one of the factors that is required to improve well-being. Economic growth is necessary for the sustainability of economic development and improved welfare (Tambunan, 2011).

The importance of technology for economic growth has been recognized for a long time (Arsyad, 1999). It has generally been viewed as shown in the Solow model (Solow, 2007). In short, the level of technology will increase the level of productivity which in turn will improve economic growth. The increase of innovation in technology can occur through research and development. Innovation is not just about high-technology products, but more about innovation that addresses specific challenges to the local context. Different types of technology innovations play different roles at various stages (OECD, 2012).

#### 3.1 Technology parks and clusters

There are many terms employed to describe parks, such as technopolis, science park, science city, cyber park, hi-tech (industrial) park, innovation centre, R&D park, university research park, research and technology park, science and technology park, technology park, technology incubator, techno park, techno pole and technology business incubator (EESC, 2011). The broad concept of high-tech clusters may encompass the above terms, but differences between the various parks become apparent when their focus and contextual background are analysed (UNIDO, 2014).

Such clusters are a geographic concentration of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition (Porter, 1998). Furthermore, clusters can be defined by the co-location of producers, services providers, educational and research institutions, financial institutions and other private and government institutions related through linkages of different types (European Commission, 2013). There is a huge diversity among clusters: they differ in terms of their stage of development along the cluster life cycle; some are networks of SMEs, some are organised around key anchor firms and, yet others have developed around universities. The importance of clusters and networks for innovation and competitiveness is increasingly recognized by policy-makers (De Propis, 2002). According to Mytelka & Farinelli (2000), techno-parks is a form of "constructed" clusters that play an important role in promoting the cooperation between two different environments: academic and business.

Technology park developers have always aimed at supporting productive capacities to boost trade and, through increased prosperity, improve the quality of life. The first parks date back to 1705 in Gibraltar and the 1840s in Hong Kong. The early 1920s saw the emergence of a variety of special areas, such as customs zones, free trade zones, free ports, free zones, industrial estates, industrial parks, science parks, technology parks, export processing zones and special economic zones, all offering services to support trade and industry. From the 1950s onwards, science, research and technology parks emerged in many industrialized countries charged with bolstering innovation by linking researchers and industry (UNIDO, 2014).

The techno park concept has contributed to the development of local industries through regional innovation policies. Techno parks have played an important role in the growth of start-ups, venture firms, and SMEs since techno parks are well aware of the importance of SMEs' competency in terms of their long-term competitiveness. Moreover, in order to foster SMEs and increase the value and competitiveness, techno parks deploy various business supporting programs and endeavours. Especially, enhancing the competitiveness of SMEs has been recognized as a driving force of local economic as well as industrial growth. Thus, many of these businesses supporting programs were designed to equip local SMEs to gain global competitiveness (Kyung *et al.*, 2014).

According to UNIDO (2014), techno parks foster innovation where creativity generates ideas, which in turn lead to innovation and new technologies and ways of doing things. They generate public-sector investment where economic growth improves citizens' quality of life. Innovation is about bringing value to the market and that value enhances quality of life. Techno parks play a key role in driving innovation at every level in every country. Innovation is high-tech, but it can also be medium tech, low-tech, and even no-tech. Techno parks also link researchers with industry as techno parks can map local industry needs and work with small business communities to give them access to research results. They also offer support in bringing research to the market. It means that techno-parks can look for research results that have commercial potential; they conduct market research and due diligence, intellectual property research, and assessments on patents and licenses.

Thus, the techno park concept builds on concentric circles with research institutions and companies at the core and areas for production situated on the outer rings. The density of specialized institutions guarantees close cooperation necessary for networking between the tenants (Figure 3).

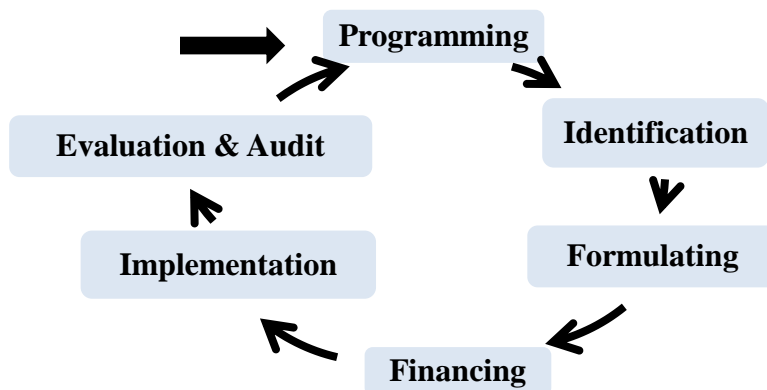


**Figure 3: Institutional linkages of the techno park concept (UNIDO, 2014)**

As the tenant companies develop and grow, the park will continue to invest in infrastructure and services, to reflect the changing demands of the companies, for instance, in providing amenities that improve the quality of the working environment (UNIDO, 2014).

### 3.2 Project Cycle Management

Project Cycle Management (PCM) is a term used to describe the management activities and decision-making procedures used during the life time of a project, including key tasks, roles and responsibilities, key documents, and decision options (European Commission, 2004). It is a methodology for the preparation, implementation and evaluation of projects based on the principles of the Logical Framework Approach (LFA). The project cycle provides a structure to ensure that stakeholders are consulted, and that relevant information is available, so that informed decisions can be made at key stages in the life of a project (European Commission, 2002). The generic project cycle has six phases as shown as Figure 4.



**Figure 4. Six phases of PCM ( (European Commission, 2004)**

For a project to be accepted by the EC all phases of the PCM methodology must be addressed and approved. Among the core PCM tools are quality assessment criteria, institutional capacity assessment and the Logical Framework Approach (European Commission, 2004).

LFA is an analytical and management tool which is used, in one form or another, by most multi-lateral and bi-lateral aid agencies, international NGOs and many governments (European Commission, 2004). According to Team Technologies (2005), LFA is a tool that has the power to communicate the essential element of a complex project clearly and succinctly throughout the project cycle. It is used to develop the overall design of a project, to improve project implementation monitoring, and to strengthen periodic project evaluation. In essence, the log frame is a "cause and effect" model of project interventions to create desired impacts for the beneficiaries. A properly planned project addressing the real problems of the beneficiaries' can't be achieved without an analysis of the existing situation. There are four types of analysis based on LFA; stakeholder analysis, problem analysis, analysis of objectives and analysis of strategies (European Commission, 2002).

## 4 METHODOLOGY

This study uses descriptive research by means of a case study. A descriptive study tries to find an exact description of all the activities, objects, processes, and communities (Basuki, 2010). Descriptive research relates to the collection of facts and valid data to provide a representation of the object under study. Here the data collection and the LFA used are described.

### 4.1 Data Collection

The study was conducted in Iceland between December 2016 and January 2017. Data and information were collected through diverse methods as follows:

#### 1. *Interviews*

Semi-structured interviews were undertaken to collect qualitative information about the implementation of Tegal MFTP and the Iceland Ocean Cluster from informants/stakeholders. The interviews were conducted with a fairly open framework which allowed for focused, conversational, two-way communication (FAO, 1990). Through interviews, the researcher sought a depth of information regarding the development of the Tegal MFTP project from a person in charge of the implementation project of MFTP in Tegal, and the person in charge in Tegal MFTP incubators activities. The benchmarking analysis of the IOC was conducted by interviewing the IOC Director, CODLAND, ISF (Iceland Sustainable Fisheries), POLAR, R&D Institution (MATIS), and Ministry of Industries and Innovation (Government representative).

#### 2. *Observation*

The researcher visited the IOC, MATIS and a ministry office making observations for benchmarking purposes.

#### 3. *Study documents*

Documents in the form of text, images, reports, or formal information from the institution or persons were collected in accordance with the suggestions of Sugiyono (2012). In this study, the



researcher used documents such as formal memorandum, government published reports, manuals, regulations, guideline, minutes of meetings, as well as information from both of the Indonesian and Icelandic governments official websites.

#### 4. *Online search*

Using the Internet to collect data is convenient and can greatly extend sample representativeness (Benfield & Szlemko, 2006). In this study, the internet was used to access data and information related to the study.

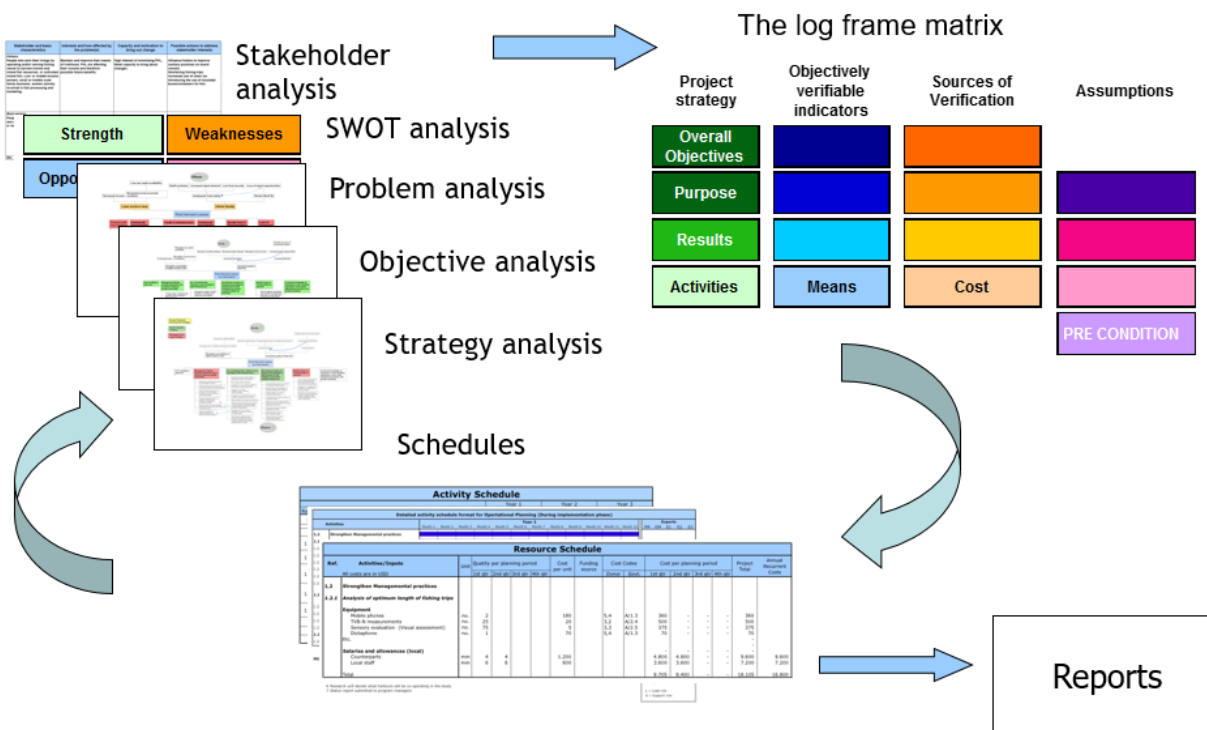
The data were then used for the PCM analysis and benchmarking purposes.

### **4.2 Logical Framework Approach**

As a part of the formulating phase of the PCM the data were analysed using the LFA. In the analysis stage of the formulation phase, four analyses were conducted (European Commission, 2002). They were:

1. Stakeholder analysis. A technique to identify and assess the importance of key people, groups of people or institutions that may significantly influence the success of an activity or project.
2. Problem analysis. It identifies the negative aspects of an existing situation and establishes the "cause and effect" relationships between the problems that exist and a problematic outcome.
3. Analysis of objectives is a methodological approach employed to describe the situation in the future once the problems that now have been remedied, with the participation of representative parties.
4. Analysis of strategies involves selecting the strategies which will be used to achieve the desired objectives. Analysis of strategies involves deciding what objectives will be included in the project, and what objectives will remain or not, and what the project purpose and overall objective will be.

For the planning phase, only the development of the logical framework matrix (LFM) was done. This sums up the feasibility of the implementation of the project and provides suggestions for improvement of the process as is seen in Figure 5. Here the LFM uses the goal of this paper as the overall activity, the Tegal MFTP project as the purpose and then the results needed for the success of the project ending in activities for improving the project.



**Figure 5: Logical Framework Approach process of analysing and planning (Gestsson, 2016)**

Ideally, the whole process of the LFA should be conducted as shown in Figure 5. However, due to limitations of time for the study and the unavailability of stakeholder involvement to help determine different perspectives, the analysis of this study will be limited to the end analysis of the LFM stage.

### 4.3 Benchmarking

Benchmarking is a core part of Total Quality Management (TQM), a subject characterized by the culture of continuous improvement (Ajelabi & Tang, 2010). It is a process of identifying superior performance or practices of other organizations or projects and to internalize such knowledge for competitive advantages (Ramabadron *et al.*, 1997). Benchmarking is a learning process to find better ways of doing things. It is a management process that requires constant updating whereby performance is regularly compared with the best performers that can be found. The key philosophy of benchmarking is the ability to recognise one’s shortcomings and acknowledge that someone is doing a better job, learn how is it being done and implement it in one’s field of business (APQC, 1996). Benchmarking is not about copying or imitating, rather it is about adapting lessons learnt from the best for the development of an improved organizational or project performance (Barber, 2004).

There are four stages in the benchmarking process, planning, data collecting, data analysis, and adoption of results. For the planning stage of this study themes that are determined as the main points for the benchmarking were found to be the success factors behind the IOC, the continuous involvement of stakeholders, importance of government support and research and developmental

support. The diverse data collected by interviews were arranged according to the themes. They were then analysed to provide an opportunity for benchmarking.

The interviews were conducted from 18-20 of January 2017 in Reykjavik, Iceland. The interviewees were Mr. Sigfusson Thor (STh), managing director of Icelandic Ocean Cluster's; Mr. Eiriksson Thomas Thor (ETT) and Mr. Davidsson David Thomas (DDT), managing director from the company's, and R&D section of Codland; Ms. Kristindottir Erla (KE), manager of Icelandic Sustainable Fisheries, took part with Mr. Josafatsson Atli Mar (JAM), general manager of Polar; Mr. Stefansson Gudmundur (SG), research group leader of Matis, and Mr. Valdimarsson Grimur (VG), senior advisor at the department of resource management, the Ministry of Industries and Innovation.

Qualitative research typically uses data triangulation in data analysis. Triangulation is the use of a variety of data sources, including time, space and persons, in a study. Findings can be corroborated and any weaknesses in the data can be compensated for by the strengths of other data, thereby increasing the validity and reliability of the results (UNAIDS, 2010). During the study, a combination of methods in collecting similar data were used to strengthen their validity and reliability.

## 5 ANALYSIS

The first of two parts of this analysis is the PCM based logical framework analysis for the case used for this study. From that analysis of identification, stakeholder analysis, SWOT analysis, problem analysis, objective analysis, and strategic analysis a logical framework matrix is designed. The matrix ties together the overall objectives of finding ways to improve the implementation process of the MFTPs, in order to establish a sustainable operation of the techno parks.

The second part of the analysis is the use of four themes found from the semi-structured benchmarking interviews with the people with various links to the IOC in order to improve the MFTP project.

### 5.1 PCM analysis of the Tegal MFTP project

#### 5.1.1 Identification

Reports of Tegal MFTP activities in 2015 and 2016 show problems have arisen during the implementation. Firstly, out of the four that were established in the first year, only one, a sea salt incubator was still active in the 2<sup>nd</sup> year of the project. This calls for a further analysis to try to seek the root of problem and offer suggestions for a solution.

Techno parks have different roles such as innovation, public-sector investment, linking researchers with industry, and support in bringing research to market (UNIDO, 2014). This is in accordance with the master plan for Tegal MFTP (Appendix 4) and also in line with the general role of the techno parks trying to connect diverse stakeholders in Tegal MFTP, such as academic and R&D institutions, entrepreneurs and industry, government, and society/community. Yet in my case of

the Tegal techno park the ties between stakeholders is far from clear. This calls for further analysis of the implementation process.

Based on performance indicators (Appendix 3), the Tegal MFTP can be categorized in a maturity between levels 1 and 2. The Tegal MFTP already has conducted some training, offered education, and certification but still lacks that industry is willing to utilize the parks facilities. It has developed a pilot scale production yet not had a sustainable tenant incubation, because the operation of the business incubator had to be discontinued.

### *5.1.2 Stakeholder and SWOT Analysis*

Any individuals, groups of people, institutions or firms that may have a significant interest in the success or failure of a project (either as implementers, facilitators, beneficiaries, or adversaries) are defined as ‘stakeholders’. A basic premise that stakeholders have different concerns, capacities, and interests, and that these need to be explicitly understood and recognized in the process of problem identification, objective setting, and selection of strategy (European Commission, 2004).

The success of the implementation of a techno park depends on the involvement of various actors or stakeholders. Based on the identification process, the implementation of Tegal MFTP has faced many problems that need to be addressed and remedied by stakeholders. Therefore, it is necessary to analyse the groups of stakeholders, the ones who are most involved, establish what their interests are, what impact they have and find out how to solve the problems arising in accordance with the role of the diverse groups.

The stakeholder analysis for Tegal MFTP is shown in Appendix 5. Five important groups of stakeholders were identified all with different interests and influence and capacity to bring about necessary change. The groups are the central government, local government, academia and R&D, the industry (including entrepreneurs), and society.

A SWOT analysis is used to analyse the internal strengths and weaknesses of an organization as well as the external opportunities and threats that it faces. It can be used either as a tool for general analysis, or to look at how an organization might address a specific problem or challenge (European Commission, 2004)

The SWOT analysis for the Tegal MFTP is presented in Appendix 6. It shows that experience in delivering training for the marine and fisheries industry, certification of competences in that field, and being able to offer technical infrastructure for marine and training constitutes a strength. At the same time the major weaknesses are unclear rules and regulations related to the park and limited facilities, lack of appropriate innovation support in line with the Tegal marine and fisheries potential and market needs, and finally the lack of capability to create synergy and collaboration of the actors. At the same time the project is seen to be facing threats from the environment, such as limited support from academia and R&D institutions. Also, the support from the local government in Tegal is lacking at the same time an international competition is increasing and fishing is reduced in accordance with the IUU fishing regulations. But the environment provides opportunities. The market for fish is growing and at the same time the communities have big expectations for the park to become successful. There is support from a community based training centre and the government sees the program as a priority support from the nearby local government

of Brebes. The results of the identification, stakeholder and SWOT analysis are now used for the following problem analysis.

### 5.1.3 Problem Analysis

The problem analysis identifies the negative aspects of an existing situation and establishes *Cause and effect relationships* (European Commission, 2004). The following problems have been identified:

- Out of four incubators that have been established and activated, only the sea salt incubator is still operational after two years.
- The Tegal MFTP's role in activating stakeholder engagement between the park and academia, R&D institutions, industry, government, and society/community is not clear. This is seen in the lack of involvement and support from stakeholders in MFTP activities.
- Based on project performance indicators (Technical guidelines for the development of MFTP, Appendix 3) the Tegal MFTP can only be categorized as been at maturity level between stages 1 and 2.

All these problems have impacted the 2016 implementation schedule of MFTP in Tegal as it still does not meet the set target. According to interviews with the Tegal MFTP stakeholders and with reference to the implementation reports, the causes for the problems are found to be:

- The limited and different understanding of the concept of MFTPs from the central government, local government, and other stakeholders.
- Limited financial support as the only source of financing comes from the government national budget
- Late access to funds due to the slow administration that in some cases leads to difficulties in providing the already planned incubator facilities
- Slow process for the preparation of documents required for the MFTP construction
- Lack of involvement in providing innovation and technology and facilities based on the local needs
- Lack of stakeholder engagement to support incubation processes from the marine and fishing industry and financial institutions

To understand the root of a problem the problem tree analysis was carried out. The complete problem tree analysis is shown in Appendix 7. Based on the effect, impact, and possible causes of the problem in the problem tree analysis, there are four major groups of problems were found to dominate the process during the implementation of the project. These groups are the financial support for the project, the administrative bureaucracy process, the availability of innovation, technology, and support facilities and lastly the customer's or the participant's satisfaction.

### 5.1.4 Analysis of Objectives

Objectives analysis is a methodological approach employed firstly to describe the situation in the future once problems have been remedied, secondly to verify the hierarchy of objectives and thirdly to illustrate the means-ends relationships in a diagram (European Commission, 2004). A figure of the objective tree for the project is shown as Figure 6.

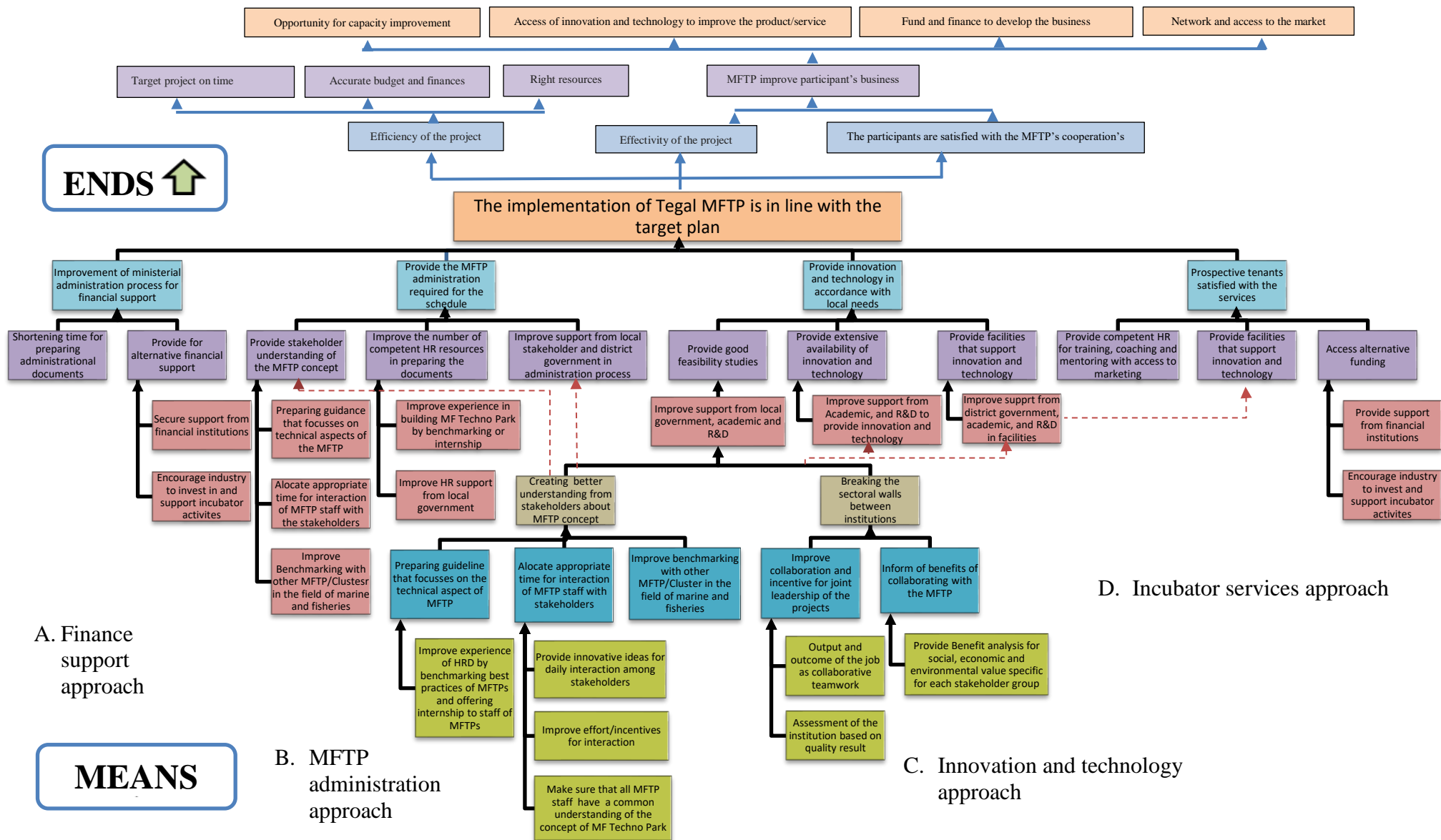


Figure 6: Objective Tree Chart and Project Selector

Based on the problem tree chart as shown as Appendix 7, it can be summarized that the project objective of the problem is to make sure the implementation of the Tegal MFTP is in line with the target plan.

To fulfil the objectives of the tree, four different approaches must be considered. A financial support approach is needed improving the ministerial administration process, a MFTP administrative approach, improving the MFTP administration process for the projects, an innovation and technology approach, providing innovation, technology, and facilities in accordance with local needs, and an incubator services approach seeking to improve the satisfaction of the participants/tenants.

#### *5.1.5 Analysis of Strategies*

The different approaches identifying the objective analysis are the inputs for the strategy analysis. The approaches are evaluated and described. The needs, time for improvement, and benefits are then explained in Table 2.

#### *5.1.6 Logical Framework Matrix*

During the process of stakeholder, problem analysis and the identification of potential project objectives, views on the potential merits or difficulties associated with addressing problems in different ways has been discussed. These issues and options then need to be more fully scrutinised to help determine the likely scope of the project before more detailed design work is undertaken (European Commission, 2004). The logical framework matrix for Tegal MFTP is shown here as Table 4.

In Appendix 8, a table of the activities needed for improvement for the four approaches is shown. They are the same as are seen in the means part of the objective analysis in Figure 6 above. These activities are the foundation of suggestions for improvement of the Tegal MFTP project, along with the benchmarking analysis that follows.

**Table 2: Problem solving comparison of each approach**

No.	Approach	Description	Need	Time	Benefit
1.	Financial support approach	Provide sustainable financial support for the MFTPs by improving the ministerial administration process	Shortening the time for preparing administrative documents	Does not need a long time depending on the consistency of planning arrangement	The process of the construction of MFTPs is fast
			Providing for alternative sources of financial support	Does not need a long time depending on result of engagement with other financial institutions that can provide funding	All stakeholders will be supportive because they feel they own the project
2.	MFTP administrative approach	Provides the appropriate MFTP local administration required for the schedule	Provide good understanding from the stakeholders about the MFTP concept	Needs time to prepare the technical guidance, allocate time for interaction, and HR in term of administration need	Stakeholders will be supportive because they feel they own the project
			Improve the number of competent HR when preparing documents	Needs time for HR building programs and engagement with the local government	HR is an importance factor for the sustainability of the project
			Improve support in the administration process from local stakeholder and district government	Does not need long time after local stakeholder and district government become involved to support the administration process	Stakeholders will be supportive because they feel they own the project
3.	Innovation and technology based on the needs approach	Provide innovation and technology in accordance with local needs	Provide good feasibility studies	Needs time to prepare comprehensive studies. It can be accelerated by involving academia and R&D institutions	Construction of MFTP in accordance with the local needs
			Provide extensive availability of innovation and technology	Does not need too long a time depending on the networking to the academia, R&D institutions and companies	Construction of MFTP in accordance to the local needs
			Provide facilities that support innovation and technology	Does not need too long a time depending on the networking to the academia, R&D institutions	Efficient budget, time, and effort
4.	Incubator services approach	Prospective tenants satisfied with the services	Provide competent HR resources for training, coaching and mentoring with access to marketing	Does not need long time depending on the selection of the best candidates and engagement with the stakeholder	The HR is the resource that ensures that the program is sustainable
			Provide facilities that support innovation and technology	Needs time for the collaboration for facilities with other institutions and the preparations of the equipment	Efficient budget, time, and the effort of cooperation with other institutions
			Provide alternative funding for limited budget	Does not need too long a time depending on the network with the financial institution and companies	Efficient budget, time and effort, and finding ways to make stakeholders see the benefits of the project



**Table 3: Logical Framework Matrix for the Tegal MFTP**

Project Description	Indicators	Source of Verification	Assumptions
<b>Overall objective:</b>			
Improving the competitiveness of marine and fisheries businesses/SMEs and related industries in Tegal	A yearly relative growth in industry's local GDP of 0.5% A yearly growth in production value of 1.5 %	Yearly monitoring survey by monitoring division under the ministry (MMAF)	
<b>Purpose:</b>			
The local sustainability of the Tegal MFTP business incubators in line with the target plan	By 2019 all incubator businesses are running sustainability and have been taken over by local government	Yearly monitoring survey by monitoring division under the ministry (MMAF)	Support by the national policy to build marine and fisheries techno park 2015 - 2019
<b>Result/Outputs/Deliverables:</b>			
1. Improvement for ministerial administration process for financial support	The process of the ministerial financial support is on schedule for the MFTP construction. Delay for funds not longer than 1 month	6 months periodically monitoring survey by monitoring division under the ministry (MMAF)	No cutting of finances from higher institutions during implementation of the project
2. Improvement for the internal administrative process of the MFTP for support for technical infrastructure and facilities	Administration process in line with the schedule of the MFTP construction. Delay in construction and implementation not longer than 1 month	6 months periodically monitoring survey by monitoring division under the Ministry (MMAF)	All stakeholders encouraged to collaborate to support the administration process
	MFTP has agreements with financial institutions for financial support by 2017. 20% of total funding by 2019 MFTP has agreement with at least 1 company related to business incubator for investment and/or financial support by 2017	6 months periodically monitoring survey by monitoring division under the ministry (MMAF)	Support by government mechanism role in stakeholder collaboration project
3. Provide innovation and technology based on the needs of industries	100% of the tenants have access to innovation and technology (Incubator activity) provided in the MFTP by 2018	6 months periodically monitoring survey	Availability of research and innovation by R&D and academia for local need of industries
4. Satisfaction of tenants with MFTP services	1 <sup>st</sup> batch tenants from 2017 have a 50% wider networks and better access to their market by 2018, and 70% by 2019	6 months periodically monitoring survey	Availability of competent HR resources for training, coaching and mentoring with access to marketing, and facilities
	25% of the 1 <sup>st</sup> batch tenants in 2017 have found financial support and have grown their business level by 2018, and 35% by 2019	6 months monitoring agencies survey	Availability of funding/ grant from government, corporate banking, or social institution.

## 5.2 Benchmarking the Icelandic Fisheries Cluster

Four distinctive themes were discovered from the interviews. They are the success factors behind the IOC, the continuous involvement of stakeholders, importance of government support, and research and development support.

### 5.2.1 Cluster Success Factors

The Icelandic Ocean Cluster (IOC) was established when the founder and CEO Thor Sigfusson built on his working relationships in order to gradually fulfil his vision of a cooperative platform between different but disconnected firms involved in the many sectors of the Icelandic ocean related industries.

At the initial start-up of the Iceland Ocean Cluster project in 2010 a gap was identified regarding the turnover in all ocean-related industries and how they interconnected. Detailed public information regarding the traditional fisheries sector was available, but there was a lack of thorough information about various other sectors such as seafood, technology, and biotechnology (Iceland Ocean Cluster, 2011). So, according to STh, it is important to have a clear vision and detailed data about the economics of the whole ocean industry in Iceland. The mapping by the Iceland Ocean Cluster represents the first comprehensive and broad picture of ocean-related industries and services, their magnitude, threats, and opportunities and was then published as a report in 2012 (Sigfusson & Arnason, 2012). The comprehensive information will help strengthening the cluster and promote the IOC with the public.

STh said that "interaction is key concept in the IOC success". It comes from his experience that people in fisheries seem only to have a small network of people in the industry. Through participation in the IOC they can expand their network and strengthen industrial ties. This is in line with what The Economist and the OECD argue that attracting the right people is the most important factor in developing successful clusters and entrepreneurial capacity (Porter & Miranda, 2012). All informants supported this statement. EET said that "the ocean cluster has been very active in supporting and facilitating the stakeholders". It has facilitated meetings with persons in the industry. About the establishment of the IOC SG said that "they are a bridge for interaction between the commercial companies and vessel owners involved in seafood fishery and seafood production. They will see a potential in the business, and from that a lot of possibilities can be developed ". JAM stated that by having business connection in the fields of fisheries (at IOC) offers an opportunity to share ideas. One of the reason that fishing companies are willing to join the cluster is that they will gain information and access to new technology.

According to DDT, "IOC has two things that makes it a success, 1) its role as a cluster, and 2) its role as an office hotel". As an office hotel (IOC) it is more like a place where tenant companies can meet and can share experiences with each other, both formally and informally. IOC has role as an umbrella of companies and entrepreneurs, as an incubator and a facilitator of conferences. This is supported by KE that stated that there are many companies that have been here (IOC) and also there are many companies from other countries that come here for meetings.

The main challenges in the development of the IOC according to STh, is "how to get people on board". How to get the companies and people from different sectors like fishermen, marketing,

designers, R&D, etc. to work together. In line with STh opinion, SG suggests that the main challenge is in the beginning on how to get all stakeholders and companies to work together. According to ETT it is basically how to find the right companies to join, or as JAM mentions it is to get a company to commit to become a part of the cluster.

The way to solve the problems, according to SG, is to "offer opportunities to get more value by working together". Stated by STh that "soon after we have people on board, they get excited, not only just to be there but also being a part of something and making a difference". KE said that if everybody felt that they could gain something, then they would be willing to join. "It is important to create a good atmosphere, build up a spirit that means that to be in the IOC is something valuable, comfortable and cozy". According to ETT, the crucial part is looking for company that has a product as the base and then making something valuable. "And, after all, then the other people or companies will look at you and be willing to join".

The key to make a cluster sustainable, according to STh is "success stories". If people know that you (IOC) have been successful, people will come and knowing what you (IOC) are doing they will continue to work with you (IOC). After a company joins it will expand the business model as a spin off and become even more open to new development and further ideas. VG states that every company needs research and to conduct a benefit and cost analysis. In the cluster, they will invest in access to man power and reduce costs. And sometimes they do not benefit much in terms of money from the cluster, but the idea of cooperation is a crucial one. IOC is very successful in building strong market connections and reputation for the product. It is important to encourage the mindset that "the competitor is not the other company in Iceland, but a foreign company in the international market".

According to STh, the IOC in the beginning "developed an initial strategy and a short term tactical agenda of doing something which would create value within 6, 12 or 18 months, placing many of the low hanging fruits under development". As for its own activities, the IOC has developed a value pyramid as a way to understand the value added derived from cod, as well as for other marine resources.

### *5.2.2 Involvement of the Stakeholder*

IOC was founded in 2012 with 12 companies and one incubation centre. Since then, the IOC has grown to 50 firms and has led to several clear successes and promising projects (Joseph, 2014). In 2016, it has around 45 business and 2 incubation centres, and has plans to develop a seafood market downstairs.

According to the STh, "Tenants have been very important, and they are becoming even more important. We at the IOC did think that the incubator is becoming the accelerator for growth of the business and becoming bigger part of our business. We are always trying to expand this accelerator because we believe there are so many young people who have lots of ideas and are willing to come and be a part of this cluster community. So, we believe that we have big role to play there".

He carried on saying that to become a part of the cluster "it only has to be ocean related and it has to be a company that is willing to pay minimum amount which is 140 dollars/month for a desk, and access to facilities. Also, it has to be a company that has a valid business plan".

According to JAM, the IOC started with partners, fishing companies, bank and port authorities. The building (Ocean cluster house) belongs to the port authorities (it is not rented from government, as it belongs to the municipality).

The involvement of all stakeholder under the cluster is important. According to DDT "In Iceland fishery is an export business, so the attitude is a little bit different. We are working together in foreign markets, because they are not competing domestically but competing with foreign parties". Furthermore, here at the IOC another reason is the smallness as there are not many companies here competing in a similar business. As the one of the companies that first moved into the IOC, JAM said that "all companies at that time did everything to promote the cluster".

Building a clean and sustainable image for the IOC is important for the stakeholders. One of the companies under the IOC is a sustainable certification company. According to KE from Iceland sustainable fisheries, her company is working on certification of certain fish species. It is similar to MSC certification but just for Icelandic companies.

ETT stated that in Iceland, all marine and fisheries companies have to be socially responsible. Under the IOC umbrella, a company can rent a room and all necessary facilities needed for entrepreneurs. Some of the bigger companies rent rooms there but don't use them regularly. It is important to them to be a part of the cluster and "by joining the IOC, they get a good image and give back value to the community".

Strengthening the EET statement, DDT said that "at the end of the day, a company that is willing to join under the cluster umbrella will benefit as their customers will find it easier to visit an office here, rather than visit small cubical offices downtown". The main point here is that the image of the ocean cluster is good.

The involvement of the stakeholders is important in supporting the development of the cluster. At the first stage, IOC started by having supporting partners like the municipality, fishing companies, a bank, port authorities and large companies. All the companies helped to promote the cluster. They contributed by promoting the cluster through inviting customers to come for a visit at the cluster house. The company also has a role in building up the clusters good image and branding. It will improve the value and image of the cluster and as well as the value of the company itself.

### *5.2.3 Importance of Ministerial Support*

It is important that the role of the government in the development of the cluster is defined. When asked about the government's role, STh he stated that in many ways the government has a role to play regarding the cluster, yet not a big role here in Iceland. He realizes that the government can support this effort more. One thing to be afraid of is a politician or a minister that likes the business model of the cluster but then a newly elected one doesn't. So, the cluster should be made as unpolitical as possible to be sustainable.

Related to the government role, DDT stated "that they set all the rules for fishery sector. As for sustainable fishery purposes for example government is currently making it a strict rule that all fish catch should be landed. It is an opportunity for the company to work with more materials and

bycatch. When we draw a line between the decision making by government, and the industry and if the government sets a regulation to bring all by-product to the shores, then the government must make sure the cost of that should be covered". Strengthening this statement, SG said that "government set the rules with the quota system". Government also set the rule that all bycatch should be brought to the shore, and frozen and collected. The government then will pay a reasonable price for that. Moreover, as explained by DDT, the government in Iceland is quite open to the idea of increasing the value of every part of the fish and is informed of better fish utilization.

Government is already collaborating with the IOC. DDT explained that "When a foreigner comes to the minister, they will often come to IOC also to see what is happening there. It also looks important for the tenant company, meeting the minister and the guest there. In this situation, the cluster house has a role as a hub".

Funding to support start-up companies is a crucial thing. According to STh, there is a national fund in Iceland, the Tech fund, a developmental fund that has been very important to some companies. "Even though the companies may only have been receiving let's say 7,000-8,000 US dollars and some other would receive 17,000-18,000 dollars, it is important for the companies to get some recognition for their proposal, and since they have written the proposal themselves they will have a much better understanding of what they are doing".

SG believes fishing industries should be commercial and not subsidized by government. "The role of the government is to create a good business environment, do trade agreement, offer infrastructure that can help companies to develop and grow, and the same things should apply to start ups". VG said that "Many entrepreneurs come to the ministry with the idea that they just need money and nothing else...and then they come back and need more funding... We have an example from 25 until 30 years ago when Marel was just founded. The Norwegian government came in with a massive amount of money to develop fish processing machines, make filleting machines and computer-aided machinery". The government can lend money to support a company, but not too much. "The message is that money is not everything".

To sum up the importance of the government to the cluster, first, government provides laws and regulations for sustainable fisheries i.e. with the quota system. This sets the framework for the fishing industry to improve the quality and value of the catch. The government also sets the regulation that all bycatch should be taken to shore, and it should be bought at reasonable prices. This regulation encourages companies and businesses to utilize and improve the added value of the bycatch. Second, government technically supports the cluster by providing access to technological assistance. Thus, the companies can access the necessary research and technology from R&D institutions, like Matis. Last, government has a role in making a good business environment, trade agreements, and infrastructure to support companies to grow and develop.

#### *5.2.4 Research and Development Support*

The ties between academia and the companies have been strong. According to SG from Matis, "In the past, there have been strong links between the fish industry, R&D and academia. Many people from academia are not only working for universities but also seeking practical solutions that have application for the fishing and processing industry". Furthermore, SG stated that "Then there are

companies like Matis that focus on research and technology. Matis has had a very close link to the IOC, supporting the participants' technology base.

"We can take the possibilities of processing of cod fish skin as an example for producing high value-added products. Several companies in the processing business have an issue with the skin, so then our decision was to collect the skin and process it for collagen. So, to be able to do that there had to be a good cooperation between CODLAND and academia. This is a typical thing to do in the cluster, to focus on where research and commercial activity are working together" said SG.

According to SG, investment in R&D is quite expensive, especially for tenants. For an entrepreneur, it is not always necessary to invest in the necessary technology at first stage of his business as this can be too risky. The possibility for them is to join the cluster, as they will then have connections to companies that have the technical knowhow and can assist them

The analysis of the four themes have been presented in chapter 5.2. These analyses of the interviews will be used along with the results of the LFM from the PCM analysis for the following discussion, conclusion and suggestions from this study.

## **6 DISCUSSION AND SUGGESTIONS**

The goal of the Tegal MFTP is to improve business processes and value added marine and fisheries products. Furthermore, it is supposed to facilitate new start-up companies with services at the business incubators, including assistance and guidance with their strategy by helping them to develop new markets or grow in existing markets. In the long term the program aims to improve the local economy and increase contributions to local revenues in Tegal and major cities around it.

It is expected that by 2019 the Tegal MFTP will be sustainable and can be transferred to the local government for carrying on the operations. Yet the project has not been meeting neither the success targets nor time set objectives according to the masterplan. This problem must be remedied.

From the analysis of the PCM the major problems are found to be the limited and different understanding of the concept of MFTPs by the central government, local government, and other stakeholders. Limited financial support and late release of funds due to the slow ministerial administration process create difficulties in providing the already planned incubator facilities. The preparation of documents required for the MFTP construction is also very problematic as well as the lack of involvement in providing innovation and technology and facilities that are based on local needs. Importantly, the lack of stakeholder engagement for support of the incubation process from the marine and fishing industry and financial institutions must be improved.

Based on PCM model four strategies (approaches) were identified that can be used to improve the progress of the Tegal MFTP. The ministry must undertake improvement of their budget disbursement process which has been less than optimal. This has interfered with the implementation. Late disbursement of funds has caused problems, including for the incubation activities and budgeted lease payments have been delayed as well. Government budget cuts have also affected the success of the Tegal MFTP project. Alternative solution is the manager must be

creative to find another funding source to support the activities of MFTP, in accordance with the rules.

Problems also occur that are linked to the administration of the Tegal MFTP. Time consuming administrative procedures and document preparation for scheduled rent of land and facilities, administration of training activities and for the licensing procedures of Environmental Impact Assessment (EIA). In order to make sure the implementation of the project runs smoothly, necessary and timely administrative support will be needed. Administrative process involving many stakeholders for cooperation and understanding has to be improved, for example in the process of preparing incubation infrastructure. Strong support from stakeholders can expedite the administrative process. Availability of competent human resources also affects the efficiency of the administrative services. To increase the HR competencies by engaging managers and staff to schedule and take part in visitations, to visit other MFTPs /clusters for benchmarking or seek short internship and learning experiences from them.

The MFTP is expected to be a forum where the flow of science and technology is turned into innovations that can provide increased competitiveness of marine and fisheries businesses and industries. Innovation and technology should be developed in accordance with local needs and the level of SMEs businesses of the area. Some of the problems of the incubation tenants in 2015 and 2016 have been technology related. This can be resolved with collaboration between agencies or with other stakeholders that can offer a more appropriate technology. This collaboration can also address problems that are associated with the lack of expertise and infrastructure facilities. The collaboration can help to optimize the budgets and improve the success of the MFTP in meeting its targets.

The recipient of the MFTP incubator service in the end is the community. Tenants of the Tegal MFTP who want to develop their business in the field of marine and fisheries, should be able to increase the level of their business and gain increased profit to become more prosperous. Failure of the incubator process could result in the termination of the necessary services for the tenants so that they will not be able to develop or continue with their business. Problems can also arise from less than optimal training facilities, unavailability of competent facilitators, unsuitable innovation, technology or facilities. There is also the problem of limited information, unfulfilled expectations of access to markets and financial support not being met. This can be overcome by improving cooperation with relevant stakeholders. This could be helped by having access to more competent HR specialists that can cooperate with both R&D and academia and provide extension officers from the local government's centre of extension. Also having access to support of innovation technology that is available by R&D and academia and support facilities from other stakeholders is important. To improve market access and investment funding networking with industry and finance institutions is advantageous.

Based on benchmarking and lessons learned from the success story of the IOC, there are several recommendations that can be proposed to improve the Tegal MFTP for it to become sustainable in 2019.

It is necessary for the MFTP to have a clear vision based on a detailed study about the economics of the whole ocean industry, especially based on their local area. As for the MFTP, their ideas and plan for innovation and development can be improved by analyses, research and reports that have

been published by R&D, academia, local government or companies. The MFTP can also initiate collaboration of relevant research with stakeholders to come up with new projects. This approach can make planning, and preparations for future scenarios and possibilities for expansion more realistic.

Better preparation will make it easier to evaluate the strengths, weaknesses, opportunities, and threats of the incubator projects and make a realistic benefit and cost analysis for the incubator project for all the stakeholders. This can be used to initiate interaction with other stakeholders, as interaction is a key concept for the clusters success.

The information gathered, especially from the benefit and cost analysis for the incubator projects, can be used to provide short term strategic plans for creating value within 6, 12 or 18 months, harvesting the "low hanging fruits". This will interest the stakeholders to collaborate with the company. At the first stage of a new MFTP their focus should be on making success stories of the few incubator projects that they have started.

From what has already been done by the Tegal MFTP, the sea salt incubator can easily be used to develop a success story. At some point, it should be made sure that the incubator will become sustainable in its operations, not only a publicity for political news. Soon after, when the business is doing well, it can try to increase the value of the salt in the value chain through innovation or differentiation and expand the business as a spin off opening further up to the new development ideas.

Government plays an important role in the development of the cluster. The role of the government in the project is quite different between Indonesia and Iceland. In Iceland, government involvement in the development of the cluster has mainly been indirect. Government set the fisheries policy as the framework for the business, and supports good business environment, trade agreement, and infrastructure. They do not put a lot of money in the form of grant or fund for the cluster. In Indonesia, the grant and fund from the government should be used as a strength for the tenant or incubator to encourage them to develop more. Learning from IOC, tenants or incubators still should pay some money to improve their willingness to learn and have ties to the project.

Cluster should develop a good image and branding. Some of the current issues in the field of marine and fisheries related is fish biosecurity, traceability, and sustainable management. Tegal MFTP should actively address their issues as it can offer certified with basic safety training, HR competence test, HACCP certificates, and good aquaculture practices.

Innovation and technology has a role in the development of clusters. In Indonesia, government support for R&D is normally without cost to entrepreneurs. It is important to be aware that the technological solutions should fit to the knowledge and needs of the tenants of MFTPs or entrepreneurs. This can be helped by collaboration with R&D institutions and academia. But technology is not everything. Learning from the benchmarking of the IOC, as the first stage of the business is quite risky, the possibility for entrepreneurs or companies is to join a MFTP. There they will have necessary facilities, connection to other companies and entrepreneurs, access to existing networks and actors in different parts of the value chain creating opportunities in other parts of the supply chain. Once they and their business has become profitable, then they can grow and invest in the necessary technology.



## 7 CONCLUSIONS

Technology park developers have always looked to support productive capacities to increase trade and, through increased prosperity, improve the quality of life. This has contributed to the development of local industries. Technology parks play important roles in the growth of start-ups, venture firms, and SMEs. Moreover, to foster SMEs with more value and heighten their competitiveness, techno parks offer various business supporting programs and endeavours.

Indonesian marine and fisheries techno parks has been established to answer those challenges. Their purpose is to contribute to the development of local industries in the field of marine and fisheries. Four MFTPs have been started. One of them is the Tegal MFTP. A lot of achievement have been made but as with total quality management, there is always room for further improvement. According to PCM based analysis and the result of benchmarking the Icelandic Ocean Cluster, some suggestion can be made.

The goal of the study has been to find ways to improve the implementation process of the MFTPs in Indonesia in order to establish a sustainable operation of the techno parks so that they can be run by local government.

The Tegal MFTP has been focussing on the development of a sea salt incubator business that was started in 2016 by collaboration with Brebes Regency. It is suggested that in 2017 a detailed benefit and cost analysis for that project will be made, considering all related stakeholders in the sea salt business hoping to attract more companies or entrepreneurs and other stakeholders willing to join the MFTP.

The sea salt production incubator of the Tegal MFTP was moved but should be open again in 2017 to start a collaboration with R&D, academia, and local stakeholders, thus helping future tenants to be successful with their businesses.

The ministry, as the main source of funding for the project, should have a consistent policy for the development of the Tegal MFTP project. The financial support from the ministry should be paid out in accordance with the budget schedule, for the project to run efficiently and effectively. Monitoring and evaluation should be implemented regularly.

It is recommended that Tegal MFTP should initiate cooperation between the financial institutions and the companies' social responsibility programs so that independent funding can be made available for the tenants' businesses.

The local government is to be totally responsible for the operations for the Tegal MFTP project at the end of 2019. MFTP must plan for being taken over by them. It is crucial to start initiating the mechanism for transfer as early as this term.

According to the government planning, 24 new marine and fisheries techno parks will be constructed around Indonesia. Based on this study, the following suggestions are made to improve the process of establishment of the new MFTP.

During the planning phase of new MFTP an analysis of new opportunities should be carried out in cooperation with stakeholders. It is suggested that a Logical Framework Approach is used. That can help guide the technical specifications for the MFTP. Such an analysis should give a detailed and comprehensive information about all relevant aspect of new marine and fisheries businesses, both direct and indirect business in the areas or regions it is operating in, and preparing future scenarios for the possibility of expansion.

When planning the new MFTP they should join in a network with the other techno parks or clusters in the field of marine and fisheries. Cooperation can be in the form of visiting, internship or training activity.

For a new MFTP it is important to provide a short term strategic plan, finding start up tenants which can create value within 6, 12 or 18 months and make good success stories that can be published. That can make other stakeholders interested in being a part of the MFTP.

The developing of a good image and branding must be thought of from the start. The new MFTP must be able to answer all issues related to food safety, eco labelling, traceability, good conduct for responsible fisheries and aquaculture and sustainability in general.

The new MFTP must enhance collaboration with other stakeholders that can assist in giving support for applications for grants, HR, offering necessary access technology facilities and marketing assistance.

The local government is an actor that must be involved in the project from the start. After the first four years, the new MFTP is supposed to be taken over by them. It is therefore crucial to craft a strategy for the mechanism needed for this transition.

## **ACKNOWLEDGEMENT**

I would like to express my gratitude to my supervisor Helgi Kristínarson Gestsson for his professional guidance, direction, input and suggestions during the time of developing and preparing this report. I am also grateful to Dr. Tumi Tomasson who is the Director of the United Nations University-Fisheries Training Program and his deputy, Mr. Thor Asgeirsson for their initial support and guidance while developing the work. I am also grateful to Mrs. Mary Frances Davidson for support, guidance, criticism and correction during the preparation of this report and would like to thank to Mrs. Sigridur Kr. Ingvasdottir for support and facilitations during the training. I would like to thank the board of the UNU-FTP and the Director of the Marine and Freshwater Research Institute, management and staff for offering me the opportunity to participate in this course and their very good support.

I would moreover like to thank my fellow colleagues in the UNU-FTP 2016 for their support and making our time warmer during our stay here in Iceland.

Finally, I would like to thank the Head of Marine and Fisheries Training Centre, Tegal Training Centre, Ministry of Marine Affairs and Fisheries in Indonesia, for allowing me to participate in this course. My warmest thanks go to my wife and family for their moral support.

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## APPENDIX

### Appendix 1: Grand Design for the Development of Science and Techno Park in Indonesia 2015-2025

**Table 4: Stage for the Development of STP in Indonesia**

Stage I 2015 – 2019	Stage II 2020 - 2024	Stage III 2015 - 2030
<ul style="list-style-type: none"> <li>• Initiation and building</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening and development</li> </ul>	<ul style="list-style-type: none"> <li>• Stabilization</li> </ul>
<ul style="list-style-type: none"> <li>• Building the new S and TP</li> <li>• Development of existing N-STP, TP and SP</li> <li>• Mapping and evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening for TP, SP, and N-STP</li> </ul>	<ul style="list-style-type: none"> <li>• Significant contribution to economic development</li> </ul>
<p><b>Target:</b> 100 TP/SP/N-STP</p>	<p><b>Target:</b></p> <ul style="list-style-type: none"> <li>• 100 STP operated, 50 TP/STP meet the basic criteria according to the STP purposes</li> <li>• New STP built at the initiative by government/local government, academic, private business institution</li> </ul>	<p><b>Target:</b> 100 TP/STP reach the basic criteria according to the STP purposes</p>

### Appendix 2: Road Map for Marine and Fisheries Techno Park (MFTP)

**Table 5: Planning for MFTP Location in Indonesia**

Location	24 MFTP	: 1) Ladong, 2) Simeuleu, 3) Belawan, 4) Pariaman, 5) Natuna, 6) Palembang, 7) Tahuna, 8) Serang, 9) Jakarta, 10) Depok, 11) Subang, 12) <b>Tegal</b> , 13) Bantul, 14) Banyuwangi, 15) Buleleng, 16) Kupang, 17) Aertembaga, 18) Wakatobi, 19) Ambon, 20) Pontianak, 21) Bone, 22) Saumlaki, 23) Sorong, 24) Merauke
Main Activity/ Program	1.	Training and education, and extension program to produce competent HR
	2.	Adaptation/Transfer of technology to produce innovative products
	3.	Business incubator to strengthening and develop new businesses
Stakeholder		Agency for MF HRD, supported by Agency for MF R&D, MF DGs, MF Business and Industry, Ministries/institutions, Academic sector, and Community.

**Table 6: Focus of Tegal MFTP Planning according to the road map**

Fields	Innovation	Certification License
1. Fisheries	<ul style="list-style-type: none"> <li>• Fishing gear</li> </ul>	✓ Basic safety training
2. Fisheries machinery	<ul style="list-style-type: none"> <li>• Fisheries machinery</li> </ul>	✓ Competence test
3. Fish processing	<ul style="list-style-type: none"> <li>• Diversification of fish products</li> <li>• Fish byproduct processing</li> </ul>	✓ HACCP certificate
4. Aquaculture	<ul style="list-style-type: none"> <li>• Aquaculture</li> </ul>	✓ Good Aquaculture Practices
5. Marine conservation	<ul style="list-style-type: none"> <li>• Sustainable and alternative energy sources</li> </ul>	✓ Nautical fisheries vessels
6. Sea salt production	<ul style="list-style-type: none"> <li>• Industried sea salt</li> </ul>	✓ Technical fishing vessels
7. Nautical		

### Appendix 3: Performance indicator for Techno Park as presented in the Maturity Level Model

**Table 7: Performance Indicator for Techno Park Per Maturity Level Model**

PERFORMANCE INDICATOR TECHNO PARK	MATURITY LEVEL MODEL			
	LEVEL I	LEVEL II	LEVEL III	LEVEL IV
Collaboration between <b>R&amp;D</b> with industries			x	x
Participation for training, education and certification	x	x	x	x
Utilization of equipment by industry	x	x	x	x
<b>Pilot scale production/prototype industry</b>		x	x	x
Intellectual property right (IPR)				x
<b>Tenant/candidate for incubation</b>		x	x	x
<b>Start-up graduation</b>				x
The labour force absorbed by the new SMEs				x
Annual turnover of SMEs which is built in the Techno Park				x
Contribution to regional development				x

Techno park Maturity Level Model:

**a. Maturity Level I**

At this level, the local government began to establish techno park concept and there is already concern to develop innovative technology. However, the interaction between ABGS (Academic, Businessman, Government, and Society) not firmly established yet. The building of infrastructure initiated.

**b. Maturity Level II**

At this level, the techno park start to have an orientation towards the development of technologies and interconnection between ABGS. Industry is begin to employ graduates from universities and training centre. Government policies that support the business climate. A services product has been developed to support the targeted community.

**c. Maturity Level III**

At this level, the result of research is directed to address local/regional problems, and support from ABGS elements begin to strengthen. Number of start-up companies in operation in the MFTP increasing.

**d. Maturity Level IV**

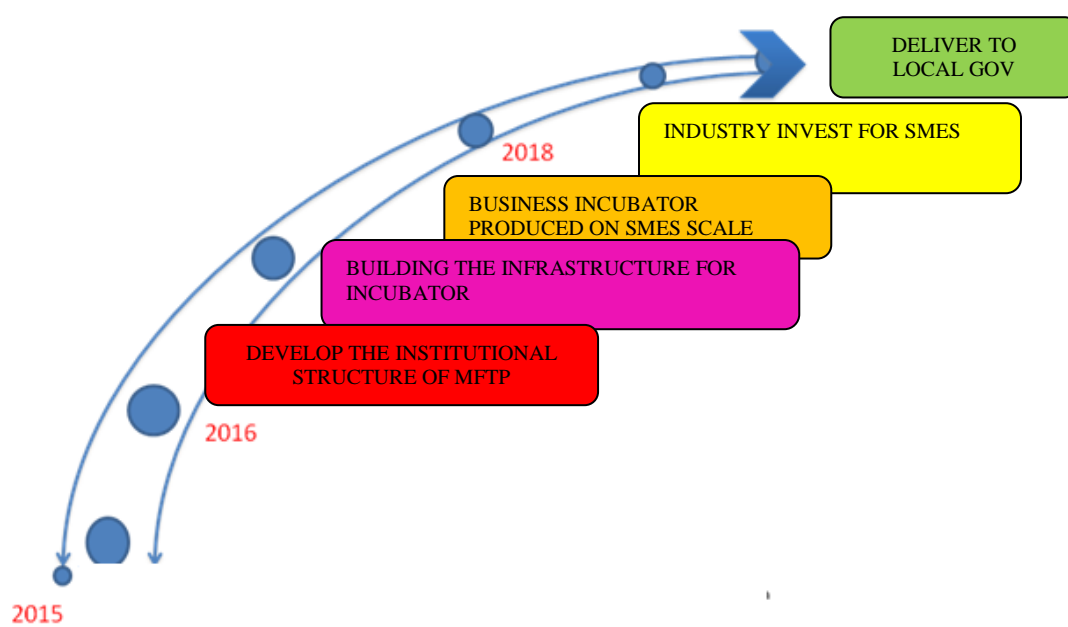
At this level, the connection between ABGS are strong and synergies well established.



**Appendix 4: The Master Plan for the Development of Tegal Marine and Fisheries Techno Park**

**Table 8: The Role of Institution involved in Tegal MFTP**

Institution	Regulator	Facilitator	Advocacy	R&D	Access investment
Central Government	x	x			
Regional Government	x	x			
Academic/SMK			x	x	
Business world/Industry					
Community/Society					
Regional investment agency					x



**Figure 7: Stages of the road map development for the Tegal MFTP**

## Appendix 5: Stakeholder Analysis for Tegal Marine and Fisheries Techno Park

**Table 9: Stakeholder analysis**

Stakeholder and basic characteristics	Interest and how affected by the problems	Capacity and motivation to bring about change	Possible actions to address stakeholder interests
<p><b>Central government</b> Consisting of several institutions/agencies across sectors for the development policies MFTP as a national program</p>	<p>The success of the MFTP program will increase the output target of the institution. The failure MFTP program will cause the performance of institutions to decrease</p>	<p>MFTP is expected to support the creation of new jobs, develop new company, increase economic growth, and increase prosperity in the marine and fisheries sector nationally</p>	<p>Preparing regulations and resources (man, money, methods) to support the development of MFTP</p>
<p><b>Local government</b> Consisting of several institutions/agencies in the scope of the marine and fisheries sector in the district/regency/city</p>	<p>MFTP success in the region will create jobs. The failure MFTP does not reflect negatively on the local government since it is considered as a program of the central government</p>	<p>MFTP is expected to support the creation of new jobs, business development, economic growth in the fisheries sector, as well as the improvement of social welfare in the marine and fisheries sector in the region</p>	<p>Preparing regulations and resources (finance, infrastructure, facility) to support the development of regional MFTP.</p>
<p><b>Academic/R&amp;D</b> Consists of several educational institutions and government agencies in the field of research and development of fisheries and marine resources</p>	<p>MFTP success will give added value output targets of the institution. The results not only for academic research purposes but also for industry. The failure MFTP program does reflect negatively on Academic/R&amp;D institution since it is considered as a central government program</p>	<p>MFTP is a place for educational institutions and research institutes to apply innovation and technology appropriate to the needs of the marine and fisheries sector</p>	<p>Giving account to innovation and appropriate technology and resources as well as man, methods, facility to support the development of MFTP.</p>
<p><b>Industry</b> Consisting of employers, groups of employers or companies engaged in the fisheries and marine sector, and some of them belonging to the community-based training centres.</p>	<p>MFTP success will boost the company's profits. Failure of MFTP does not cause the company to suffer losses</p>	<p>MFTP a forum for them to develop a network and business in the marine and fisheries sector. To increase value / profit companies as well as improved brand / company image.</p>	<p>Invest in MFTP, open access to information on business opportunities in marine and fisheries sector. Increasing the quality and quantity of products/services produced</p>
<p><b>Society</b> Consisting of society in general, training alumnae, or a group of marine and fisheries businesses who are interested to developing businesses in the marine and fisheries sector</p>	<p>MFTP success by involving society will increase the level of business and leisure, the ease of access to the market, innovation and technology, and financing. The lack of success of this program will led to reduced access to the markets, innovation, and appropriate technologies, as well as reduced financing</p>	<p>Business development, increase economic benefits, which resulted in the improvement of the welfare of the family.</p>	<p>Encourage motivation, willingness, and enthusiasm to work and develop business in the field of marine and fisheries</p>

## Appendix 6: SWOT Analysis for Tegal Marine and Fisheries Techno Park

**Table 10: SWOT Analysis for Tegal MFTP**

<p><b>Internal</b></p>	<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>✓ Experience in delivering technical training in marine and fisheries</li> <li>✓ Certification of competence in the field of marine and fisheries</li> <li>✓ Facility and technical infrastructure for marine and fisheries training</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>✓ Unclear rules and regulation</li> <li>✓ The infrastructure still partly the training centre</li> <li>✓ Limited space for incubator activity</li> <li>✓ Lack of innovation that is appropriate for the local capacity and market need</li> <li>✓ Lack of capability to synergize and collaborate with the Tegal government, education and R&amp;D Institutions</li> </ul>
<p><b>External</b></p>	<p><b>Opportunity</b></p> <ul style="list-style-type: none"> <li>✓ High demands for fisheries production in the market</li> <li>✓ High expectation by the community for the success of the techno park</li> <li>✓ Support from community based training centre</li> <li>✓ Maritime sector is a government priority program</li> <li>✓ Support from Brebes government to the development of marine and fisheries techno park</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>✓ Limited support from academic/university</li> <li>✓ Limited support from research institutions (R&amp;D) for the providing access to applied innovations and technology</li> <li>✓ Lack of support from the Tegal government</li> <li>✓ Competition from other countries</li> <li>✓ Reduced availability of the raw materials because of the IUU fishing regulation</li> </ul>

Appendix 7: Problem Tree Chart

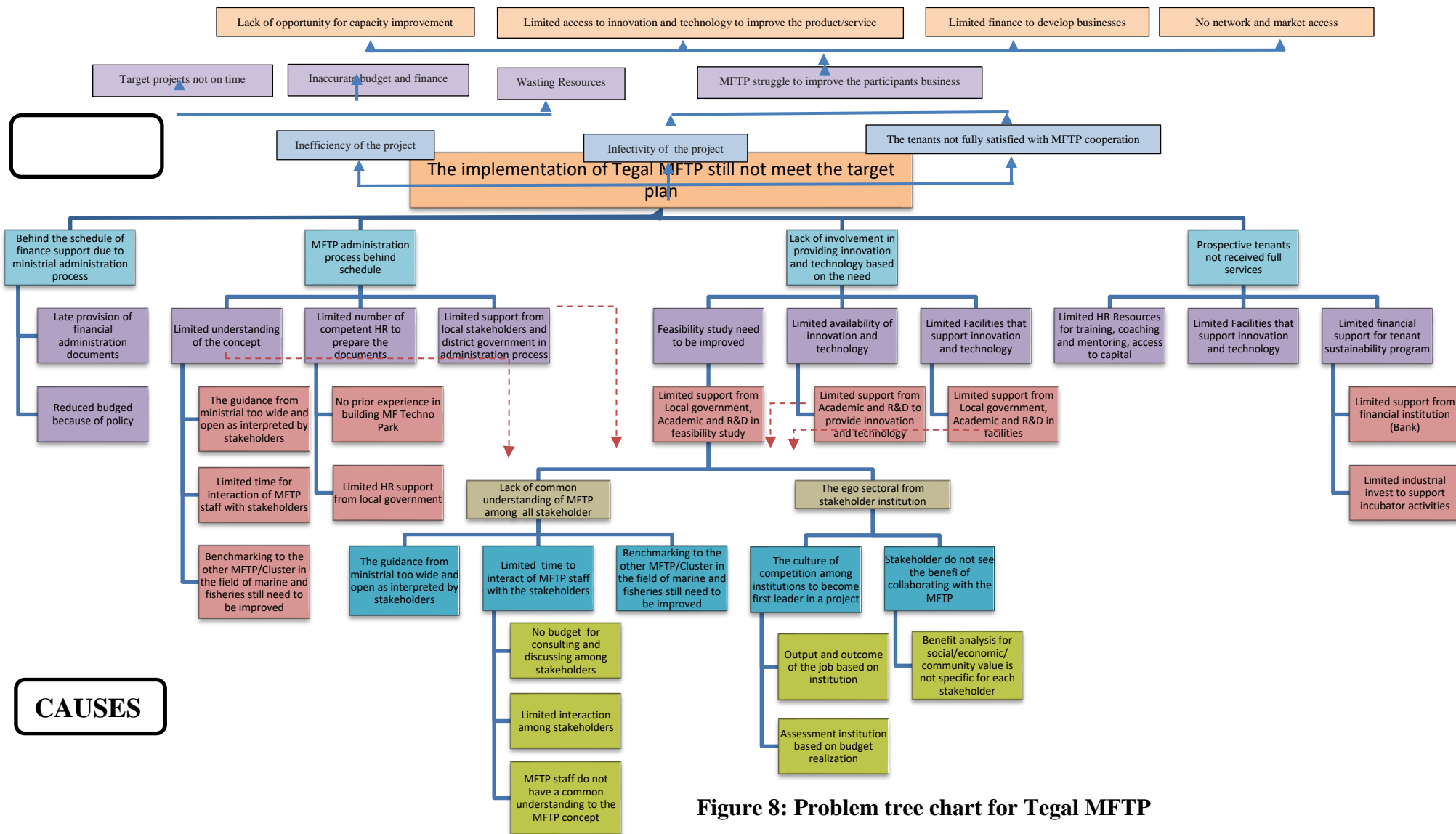


Figure 8: Problem tree chart for Tegal MFTP

## Appendix 8: Activities needed for Tegal MFTP improvement based on LFM

**Table 11: Activities needed for Tegal MFTP improvement based on LFM**

Activities	Assumptions
1.1. Improving time for preparing administration documents	Support by government mechanism role in stakeholder collaboration project
1.2. Provide for alternative finance support	- The environment for marine and fisheries business supported by government - Supported by comprehensive benefit analysis for finance institution.
1.2.1. Provide support from financial institutions	- Supported by comprehensive benefit analysis for finance institution.
1.2.2. Encourage industry to invest and support incubator activities	- Supported by comprehensive benefit analysis for industry.
1.1. Provide good understanding of the concept	Availability of funding, guidance, appropriate time for interaction, and benchmarking to other MFTPs
❖ Preparing guidance that focus on technical aspects of MFTP	Supported by funding to improve the HR experience by benchmarking best practices of MFTPs and offering internship to staff of MFTPs
❖ Allocate appropriate time for interaction of MFTP with the stakeholders	Supported by guidance that focusses on the technical aspects of MFTP
❖ Improve benchmarking to the other MFTPs/Clusters in the field of marine and fisheries	Supported by funding to improve the HR of the stakeholder by benchmarking to the other MFTPs/Clusters
2.1. Improve the number of competent HR in preparing the documents	
2.2.1. Improve experience in building MFTP by benchmarking or internship	Availability of funding to improve the HR of the stakeholder by benchmarking to the other MFTPs/Clusters
2.2.2. Improve HR support from local government	Local stakeholder and district government sign agreement to support the administration process
2.3. Improve support from local stakeholders and district government in administration process	Local stakeholders and district government sign agreement in supporting the administration process
3.1. Provide good feasibility studies	Support from the national policy to build marine and fisheries techno park 2015 - 2019
3.1.1. Improve support from local government, academic, and R&D	Local government, academic, and R&D sign agreement to support of feasibility studies
3.1.1.1. Creating better stakeholder understanding about the MFTP concept	Availability of funding, guidance, appropriate time for interaction, and benchmarking to other MFTPs
❖ Preparing guideline that focus on the technical aspects of MFTP	Supported by funding to improve the HR experience by benchmarking best practices of MFTP's and offering internship to staff of MFTPs
❖ Allocate appropriate time for interaction of MFTP staff with the stakeholders	Supported by guidance that focusses on the technical aspects of MFTP
❖ Improve benchmarking to the other MFTPs/Clusters in the field of marine and fisheries	Supported by funding to improve the HR of the stakeholder by benchmarking to the other MFTPs/Clusters
3.1.1.2. Breaking the sectoral walls between the institutions	Support benefit analysis for social, economic and environmental values specific for each stakeholder group
❖ Improve collaboration and incentive for joint leadership of the project	- Assessment of the institution based on quality of results

Activities	Assumptions
	- Output and outcome of the job as collaborative teamwork
❖ Inform of benefits of collaborating with the MFTP	Supported by benefit analysis for social, economic and environmental value specific for each stakeholder group
3.2. Provide extensive availability of innovation and technology	Support by government mechanism role in sharing innovation and technology
3.2.1. Improve support from academic and R&D to provide innovation and technology	Academic and R&D sign agreement to provide innovation and technology
3.2.1.1. Creating better stakeholder understanding about the MFTP concept	Availability of funding, guidance, appropriate time for interaction, and benchmarking to other MFTPs
❖ Preparing guideline that focus on the technical aspects of MFTP	Supported by funding to improve the HR experience by benchmarking best practices of MFTPs and offering internship to staff of MFTPs
❖ Allocate appropriate time for interaction of MFTP staff with the stakeholders	Supported by guidance that focusses on the technical aspects of MFTP
❖ Improve benchmarking to the other MFTPs/Clusters in the field of marine and fisheries for stakeholder	Supported by funding to improve the HR of the stakeholders by benchmarking to other MFTPs/Clusters
3.2.1.2. Breaking the sectoral walls between the institutions	Support benefit analysis for social, economic and environmental values specific for each stakeholder group
❖ Improve collaboration and incentive for joint leadership of the projects	- Assessment of the institution based on quality of results - Output and outcome of the job as collaborative teamwork
❖ Inform of benefits of collaborating with the MFTP	Supported by benefit analysis for social, economic and environmental value specific for each stakeholder group
3.3. Provide facilities that support innovations and technology	Support by government mechanism role in sharing facilities
3.3.1. Improve support from district government, academic, and R&D in facilities	District government, academic, and R&D sign agreement to provide facilities
3.3.1.1. Creating better stakeholder understanding about the MFTP concept	Availability of funding, guidance, appropriate time for interaction, and benchmarking to other MFTPs
❖ Preparing guideline that focus on the technical aspects of MFTP	Supported by funding to improve the HR experience by benchmarking best practices of MFTPs and offering internship to staff of MFTPs
❖ Allocate appropriate time for interaction of MFTP staff with the stakeholder	Supported by guidance that focusses on the technical aspects of MFTP
❖ Improve benchmarking to the other MFTPs/Clusters in the field of marine and fisheries for stakeholder	Supported by funding to improve the HR of the stakeholder by benchmarking to the other MFTPs/Clusters
3.3.1.2. Breaking the sectoral walls between the institutions	Support benefit analysis for social, economic and environmental values specific for each stakeholder group
❖ Improve collaboration and incentive for joint leadership of the projects	- Assessment of the institution based on quality of results - Output and outcome of the job as collaborative teamwork
❖ Inform of benefits of collaborating with the MFTP	Supported by benefit analysis for social, economic and environmental value specific for each stakeholder group

Activities	Assumptions
4.1. Provide competent HR resources for training, coaching and mentoring with access to marketing	All stakeholder related sign the agreement to provide HR for training, coaching and mentoring with access to marketing
4.2. Provide facilities that support innovation and technology	Support by government mechanism role in sharing facilities
4.2.1. Improve support from district government, academic, and R&D in facilities	District government, academic, and R&D sign the agreement to provide facilities
4.2.1.1. Creating better stakeholder understanding about the MFTP concept	Availability of funding, guidance, appropriate time for interaction, and benchmarking to other MFTPs
❖ Preparing guideline that focus on the technical aspects of MFTP	Supported by funding to improve the HR experience by benchmarking best practices of MFTP's and offering internship to staff of MFTPs
❖ Allocate appropriate time for interaction of MFTP staff with the stakeholder	Supported by guidance that focusses on the technical aspects of MFTP
❖ Improve benchmarking to the other MFTPs/Clusters in the field of marine and fisheries for stakeholder	Supported by funding to improve the HR of the stakeholder by benchmarking to the other MFTPs/Clusters
4.2.1.2. Breaking the sectoral walls between the institutions	Support benefit analysis for social, economic and environmental values specific for each stakeholder group
❖ Improve collaboration and incentive for joint leadership of the projects	<ul style="list-style-type: none"> <li>- Assessment of the institution based on quality of results</li> <li>- Output and outcome of the job as collaborative teamwork</li> </ul>
❖ Inform of benefits of collaborating with the MFTP	Supported by benefit analysis for social, economic and environmental value specific for each stakeholder group
4.3. Provide alternative funding for limited budget	<ul style="list-style-type: none"> <li>- The environment for marine and fisheries business supported by government</li> <li>- Supported by comprehensive benefit analysis for finance institution.</li> </ul>
4.3.1. Provide support from financial institution	- Supported by comprehensive benefit analysis for finance institution.
4.3.2. Encourage industry to invest and support incubator activities	- Supported by comprehensive benefit analysis for industry.
Precondition	Supported by the National Policy to Build Marine and Fisheries Techno Park 2015 - 2019