Participatory rural appraisal strategy in realizing the standardization of ship components

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Abstract. The role of ships for Indonesia is very important as a trigger for economic development and inter-island liaison. In line with the Indonesian government program in realizing the sea toll program and as the ruler of the world maritime axis, the ship needs will increase rapidly then the shipping industry becomes the main foundation in supporting this program. However, the development of the shipping industry in Indonesia is still hampered because ship components are still largely imported. As many as 70% of ship components must be imported from abroad. While many domestic SMEs of ship components have not been standardized, so they have not been able to support the shipping industry. The purpose of this study is to formulate participatory rural appraisal strategy in realizing the standardization of ship components. The results of the research indicate that there are five main factors influencing the success of product standardization: function and performance of Local Working Group Platform, the involvement of strong certification institutions, availability of technical expert and supporting institutions, shipyard in Evaluation Monitoring. The standardization program undertaken by SMEs of ship component is very important to support the shipping industry in Indonesia.

1. Introduction
The world's shipping industry is currently controlled by China, Japan, and Korea, which controls the market for up to 90% of total ship orders worldwide [1]. As a maritime country with the longest coastline in the world, Indonesia should have the potential to compete in the world's shipping industry. But since the monetary crisis hit, the shipyard utilities in Indonesia are declining and the Indonesian shipbuilding industry increasingly difficult to compete in the world shipping industry [2].

There are several major shipyard problems in Indonesia according to the Biro Klasifikasi Indonesia [3], among others: Capacity and productivity of national shipyard are still low, Facilities and equipment in many shipyards are old, domestic shipbuilding ship price is relatively more expensive 10% to 30%, weak local banking support, about 70% to 80% component and ship material still to be imported. The most dominant main problem is the high dependence on imported materials and components which account for 70 percent of the total cost of shipbuilding [4,5].

The importance of the availability of component and material raw materials made the government make various efforts to encourage the growth and development of ship component industry in the country to be able to supply the needs of the shipyard industry according to the standard [6]. Seeing the
large potential of ship component requirement, small and medium of ship component business actors (SMEs of ship component) take the initiative to standardize ship components. Standardization of ship components is an action plan from the community as a ship component business. This standardization action plan was triggered by the problems of market development in supporting the needs of domestic shipyards and facing free trade.

This is in line with Soetrisno's opinion that the effort of standardizing products is very relevant to SMEs in Indonesia, which until now face the problem of competitiveness, especially to face the global market [7].

The purpose of this study is to formulate participatory rural appraisal strategy in realizing the standardization of ship components. The objective used to achieve the objective is to identify existing ship component products and identify factors that influence the success of ship component standardization. Because with standardization can increase market confidence in ship component products [8].

2. Methodology

Standardization will be easier to build based on the wishes of the community as actor of ship component business [9]. Participatory Rural Appraisal (PRA) approach method is very appropriate because SMEs of ship component can participate in realizing the plan, implementation, supervision, and evaluation of product standardization program [10,11]. With the community involved in the program process, it can increase community awareness in running the program. The PRA method is described as a technique that allows the community to participate in realizing the plans [10], implementation, monitoring, and evaluation of policies that have an impact on the life of the community.

To be able to determine which products will be developed as standardization products, it is necessary to identify products that already exist in the market. The product to be surveyed may be more than one product depending on how many products are in the market. Furthermore, training and assistance in the development of product standardization. The steps are illustrated in the Figure 1:

3. Results and discussions

3.1. Local Working Group (LWG)

Some representatives of ship component business actors need to conduct Focus Group Discussion to formulate action plans. The formulation of an action plan starts with determining the main objective of standardizing ship component products by describing what products to develop and which markets to target. This is done to request support from stakeholders.

Furthermore, to realize this standardization plan, LWG is set up to function as a platform for SMEs of ship component to plan and facilitate the standardization plan and mobilize resources to achieve a challenge of standardization process together. LWG is tasked with designing and scheduling...
sequentially activities in accordance with the standard certification process and facilitating standardization plan with related institutions. As LWG support data needs to conduct value chain analysis, utilization of ship component product technology, and product standardization socialization.

To determine which component of ship product to be standardized, it is necessary to identify the product including the availability of raw materials, the ability of the ship production process and its market share. The surveyed products of more than one product are Side scuttle, Square window and Weathertight door as seen in Figure 2 with the following considerations:

- Raw materials, i.e. aluminum scrap, aluminum profiles, steel plates, steel profiles and other
- supporting materials such as rubber seals, tempered paint, and glass are all available in the area of SME locations of ship components,
- The ship's component SME has the technology and production process capabilities to the product.
- Has an excellent market potential because it is required in large quantities in a ship.

The results of field identification indicate that the ship component product produced by ship component SMEs can be illustrated in table 1. Product Identification Result of ship component.

![Figure 2. Products of ship components to be certified.](image)

**Table 1.** Product Identification Result of ship component.

| Product            | Raw materials             | Production process          | Description                              |
|--------------------|---------------------------|-----------------------------|------------------------------------------|
| Side scuttle       | Aluminum scrap, rubber seal, tempered glass | Casting, machining, assembling | The composition of casting material is not standardized and not uniform |
| Square window      | Aluminum profile, rubber seal, tempered glass | Machining, assembling       | Product dimensions and quality are not uniform |
| Weathertight door  | Steel plates, steel profiles, rubber seals | Cutting, machining, assembling | Product dimensions and quality are not uniform |

3.2. **Involvement of certification institution**

Certification institution such as the Indonesian Bureau of Classification is involved since the standardization planning stage as a source of information through socialization related to the standardization process of ship components. Bureau of Classification Indonesia also plays a role in achieving standardization through the provision of technical guidance and advice related to the manufacture of prototypes and the preparation of documents required for certification. Therefore, when facilitating the industry for certification and development of new markets, agencies with certification authorities should be involved from an early stage.
3.3. Availability of technical experts and supporting institutions

The availability of competent local experts can provide appropriate advice and follow-up services is another key to success. A local expert for metal-working, mobilized by the local government, can make regular visits to SMEs of ship component and provide appropriate advice in the prototype and testing process. The support of government agencies with adequate infrastructures such as Ferro and non-ferrous material testing laboratories, engineering drawing studios, and modern machining workshops also contribute to the successful achievement of ship component quality standards. They have responded to the issues faced by SMEs flexibly. The technical guidance includes the preparation of quality documents, product design, production process, workshop development according to 3S concept (sort, set in order, and shine), preparation of quality documents, use and facilitation of technology and laboratory testing. As illustrated in Table 2 below:

| Product     | Product design                                                                 | Production process                                                                 | Description                                      |
|-------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------|
| Side scuttle| • Design the product as per the quality document                                | • The flow of production processes is simpler according to the 3S concept          | The product is certified by the Indonesian classification bureau |
| Square window| • Design Testing of materials and products as per quality documents            | • SOP as per the quality document                                                  |                                                 |
| Weathertight door|                                                                                      |                                                   |                                                 |

Product development strategy is determined to improve the quality of an existing product. The following results are submitted for quality standards for ship components: non-water tight door (SNI 7361, 2007), Weathertight door for small boat (SNI 7362, 2007), shipbuilding and sea construction ship side window (SNI ISO 1751, 2007), Weathertight one-sided steel door (SNI ISO 6042, 2007), ships Side Scuttles (ISO 1751, 1993), shipbuilding and marine structures ships, heated glass panels for ship rectangular window (ISO 3434, 1992), shipbuilding and marine structures ships, heated glass panels for ship rectangular window (ISO 3434, 1992), shipbuilding and marine structures ships, heated glass panels for ship rectangular window (ISO 3903, 1993).

3.4. Strong contribution SMEs of ship component

There is no doubt that the willingness and commitment of ship component SMEs are indispensable in the case of standardization of ship component products. SMEs who participated in this product standardization plan took a strong initiative related to the certification process, namely:

- Development of workshop according to the 3S concept,
- Long-term continuous experiments for prototype manufacturing and material/product tests that meet ship component quality standards,
- The movement of resources to prepare raw materials/labor for the manufacture of prototypes.

3.5. Monitoring and evaluation

The next challenge is how SMEs of ship components enter the global market. The Ministry of Industry facilitates business meetings between ship component SMEs who have successfully obtained product certification with the shipyard. Another promotional tool is to include IKM Components of ships at the international trade fair. While monitoring and evaluation were done by shipyard and Bureau of Classification Indonesia together. When the ship component is installed in the ship unit, it must be evaluated for conformity with the quality standard.

4. Conclusion

The success of facilitation activities of SMEs development of shipping components in the achievement of product quality standards of ship components is determined by four main factors, i.e.:
• The function and performance of the LWG Platform
• Strong involvement of certification institutions
• Availability of technical experts and supporting institutions in the regions
• Contribution and strong willingness of ship component SME to standardize the product
• Monitoring and evaluation

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