

**RULE, OPPORTUNITY, CAPACITY, COMMUNICATION,  
INTEREST, PROCESS, AND IDEOLOGY (ROCCIFI) ANALYSIS  
OF REFILLED DRINKING WATER DEPOT PRODUCTION:  
A STUDY IN INDONESIA**

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**Abstract**

This research aims to determine the fulfilment of drinking water quality in the production process by the refill drinking water depot (RDWD). The research method uses a normative legal approach using the analysis technique using rule, opportunity, capacity, communication, interest, process, and ideology (ROCCIFI) as an instrument to explore and reveal problems related to the quality of drinking water produced at RDWD. The research results show that from all aspects of analysis using ROCCIFI, drinking water production at RDWD does not meet the standards applicable in Indonesia. Thus is very risky for health aspects.

Keywords: Drinking water, Legal aspects, Indonesia, Refill drinking water depot, ROCCIFI.

## 1. Introduction

Today, there is a water deficit condition [1]. This condition means that water is no longer a common good alone; it has become an economic commodity, of high value (expensive) [2, 3]. The increasing need for clean water, especially drinking water, especially in urban areas, has encouraged the growth of the bottled drinking water industry, which provides hygienic drinking water for public consumption, has encouraged the emergence of the RDWD industry, which directly provides refillable drinking water without a particular brand to consumers [4]. On the one hand, the existence of RDWD can help the community by providing adequate drinking water. RDWD brings new problems to aspects of public health related to the quality of drinking water provided [5]. Water is a basic need for all living creatures, especially humans, for domestic energy, agricultural and industrial purposes [6-9]. The need for and access to water can be adequately met, the available water resources must be managed well water can be accessed anytime, anywhere, and by anyone [10].

Based on our previous studies, this research aims to determine the legal aspects of fulfilling drinking water quality in the RDWD production process [11, 12]. The research is novel in the analysis aspect produced using the rule, opportunity, capacity, communication, interest, process, and ideology (ROCCPI) technique, resulting in a thorough understanding of the problem to find answers or explanations to resolve problems related to the provision of drinking water by the RDWD. Related to the problem above, Table 1 shows several similar studies that have been carried out.

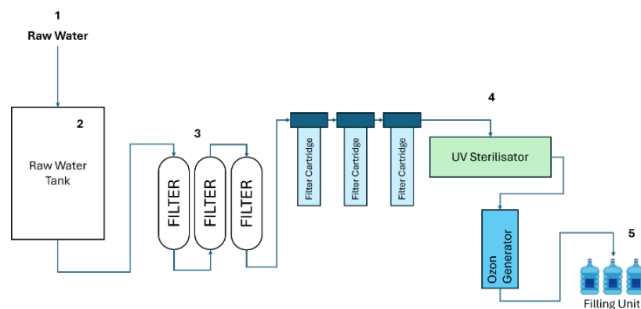
**Table 1. Previous research regarding drinking water quality at RDWD.**

No.	Title	Ref.
1.	Microbiological and biochemical contamination analysis of refilled drinking water in Abeli, Kendari, Southeast Sulawesi	[13]
2.	Risk of disease due to contamination of refill drinking water: using quantitative microbial risk assessment	[14]
3.	The influence of products quality and service quality on customers loyalty of drinking water refill depot in Bandung city	[15]
4.	Hygiene and sanitation management of drinking water refill depots for feasibility consumption in Kendari city, Indonesia	[16]
5.	Performance and energy consumption evaluation of rotating biological contactor for domestic wastewater treatment	[17]
6.	Physic-chemical investigation of wastewater from the sebdou-temcen textile complex North-West Algeria	[18]
7.	Assessment of iron contamination in groundwater of catchment area water	[19]
8.	Step-by-step fabrication of PVDF-TiO <sub>2</sub> hollow fiber membrane and its application desalination of wetland saline water via pervaporation.	[20]
9.	Real time water quality monitoring system for smart city in Malaysia.	[21]
10.	Assessment and optimization of coagulation process in water treatment plant: a review.	[22]

## 2. Literature Review

The RDWD production process consists of several stages that need to be considered to ensure the water quality is safe and suitable for consumption. Fig. 1, is a description of the production process as follows:

- (i) Input: Raw water can come from various sources, such as groundwater, drinking water companies, or river water. Raw water is checked periodically for organoleptic (smell, taste, colour), physical, chemical, and microbiological examinations.
- (ii) Shelter: Raw water is stored in tanks or reservoirs. Shelters must be made from food-grade materials
- (iii) Filtering: The function of the sand filter is to use coarse particles. The material used is silica grains ( $\text{SiO}_2$ ) with a minimum size of 80%. Active carbon filters from coal or coconut shells absorb odours, tastes, colours, residual chlorine, and organic materials. The absorption capacity of ladine ( $\text{I}_2$ ) minimum 75 %. Other filters/filters that function as fine filters minimum 10 microns.
- (iv) Disinfection: Disinfection is intended to kill pathogenic germs. Using ozone ( $\text{O}_3$ ), takes place in a tank or other ozone mixing device with an ozone concentration of minimum 0.1 ppm and ozone residue immediately after filling ranges from 0.06-0.1 ppm [23]. Disinfection measures other than ozone can be carried out using ultraviolet (UV) irradiation with a wavelength of 254 nm or a strength of 25370 A with a minimum intensity of 10,000 mw per  $\text{cm}^2$  [24].
- (v) Outputs: It is a drinking water-filling unit. RDWD may not have stock. It must not be branded or plain; the lid must also be plain. Containers brought by consumers must be checked, and containers not allowed to be used are unsuitable.



**Fig. 1. Production process at refill drinking water depot.**

## 3. Method

This study uses a statute approach and a conceptual approach. In this regard, a study was conducted on the ratio legis of the formation of a statutory regulation. The research method uses a normative legal approach using the ROCCPII analysis technique as an instrument to explore and reveal problems related to the quality of drinking water production at RDWD [25].

## **4. Results and Discussion**

### **4.1. Rules**

Juridically, the RDWD industry is regulated in the Decree of the Minister of Industry and Trade Number 651/MPP/Kep/10/2004 concerning Technical Requirements for RDWD. With the RDWD regulation in the form of a Ministerial Decree, of course, the form of regulation in the form of a Ministerial Decree is inappropriate. Based on Law Number 12 of 2011 concerning the Formation of Legislative Regulations, the regulation of RDWD as a ministerial decree is inappropriate and no longer by the rules for forming statutory regulations. Therefore, it is no longer relevant at this time, when the regulation of the RDWD industry is still based on Minister of Industry and Trade Decree.

### **4.2. Opportunities**

Related to opportunities aspect, many RDWD business actors in various regions do not have business permits to run RDWD businesses. There is a lack of awareness of business owners in managing business permits; apart from that, there is also no firm action from the relevant agencies to enforce sanctions on drinking water depot businesses that do not have permits. Business owners' lack of awareness of processing business permits and the absence of firm action from the relevant agencies to enforce sanctions on RDWD businesses that do not have permits are among the factors behind the low legal awareness of this licensing.

### **4.3. Capacity**

In this case, it is related to the capacity of RDWD business actors to produce refillable water suitable for public consumption. The source of failure in the quality of refilled drinking water is not meeting the quality standards for total coliform parameters, including aspects of man, machine, method, and environment [26]. The problem at RDWD is that the quality of the water produced is not adequate for Food Sanitation Hygiene, which, of course, is very dangerous to public health [27].

Even though RDWD does offer drinking water services at cheap and affordable, the problem is that the quality of the water produced may not be suitable, that requires serious handling from the government, to optimize the supervision of RDWD's existence [28]. The quality of refillable drinking water in terms of physics, chemistry, and biology means that two parameters do not meet drinking water quality standards [29]. The bacteriological quality of drinking water at RDWD in Majalengka regency, 25% did not meet the requirements [30]. The sanitation hygiene of RDWD in the Tanah Bumbu regency area did not meet the requirements, with a percentage of 89.1% [31]. Examinations according to microbiological parameters carried out at eight RDWD in the Ranotana-Weru showed that three of the eight RDWD contained coliform bacteria, amounting to 13 MPN/100 ml and depot *E. coli* amounts to >240 MPN/100 ml [32]. In the confirmation test, it was stated that the suspected coliform bacteria found at the refill drinking water depot in Tanjung Mulia Village were positive for coliform [33]. The quality of drinking water produced by the RDWD in Bungus Padang District showed that 55.5% of the samples did not meet the microbiological requirements [34]. Another study emphasized the need for good food handler hygiene and sanitation of equipment and place in drinking water depots. It found

that only 9.1% of the water produced by RDWD was contaminated by E. coli [35]. The highest source of failure respectively is the contact time of the UV lamp with water during processing [36]. There are six chemicals with the highest levels of contamination: Fe, Mn, NO<sub>2</sub>, NO<sub>3</sub>, F, and Zn [37].

#### **4.4. Communication**

This aspect be closely related to the knowledge aspect of RDWD business actors regarding regulations related to RDWD. By looking at the low capacity of business actors in carrying out their business, and the low level of legal awareness regarding licensing and fulfilling other aspects, it can be said that the knowledge of RDWD business actors regarding regulations related to RDWD is shallow. Most RDWD in Bengkulu City were processed without using complete drinking water processing components [38].

#### **4.5. Interest**

Related to this, the low quality of human resources for RDWD business actors, the low quality of drinking water produced by RDWD, and the low awareness of actors in obtaining business permits be closely related to the motivation, ability, and commitment of RDWD business actors. Because for business actors, increasing human resource capacity, compliance with permits, and provisions for adequate drinking water standards are not directly proportional to the material benefits they get. In other words, without increasing human resource capacity, compliance with standard provisions and licensing can not have an impact on increasing production and sales of the drinking water they produce.

#### **4.6. Process**

The process aspect be closely related to other aspects that have been described earlier. How RDWD business actors comply with and obey all laws and regulations related to their business be greatly influenced by the substance aspect of the regulation itself, the law enforcement aspect by the relevant agencies, and of course the awareness of the RDWD business actors themselves. Thus, weak supervision and law enforcement ultimately greatly affect the legal awareness of RDWD business actors.

#### **4.7. Ideology**

Ideology refers to matters of belief, including values, attitudes, tastes, myths about the world, religious beliefs, and political, social, and economic ideologies that are more or less well-defined. The knowledge of refill drinking water depot entrepreneurs about refill drinking water depots is inadequate [38]. Hygiene sanitation at RDWD is inadequate because the perpetrators are still not trained and have not attended training courses for either the employers or the workers. Thus, of course, the behaviour of RDWD business actors who lack the knowledge capacity greatly influence the quality of the drinking water they produce. RDWD's business activities are limited to pursuing optimal production and marketing without paying attention to moral responsibility regarding the quality of the drinking water provided.

## 5. Conclusion

Based on the ROCCIPI analysis approach in this study is as follows. Rules: There is a mismatch in the types and hierarchy of statutory regulations that form the legal basis for regulating the RDWD industry. Opportunity: apart from licensing issues, another problem that occurs in RDWD's business activities is that there are many violations from drinking water depot business owners by accumulating stock of gallons ready to be sold, and for this, there have been no sanctions from the relevant agencies. Capacity: apart from the awareness of RDWD business actors regarding licensing, it turns out that the process of producing refillable drinking water at RDWD is also a problem. Communication: with the low capacity of business actors to carry out their business and low legal awareness regarding licensing and compliance with other aspects, it can be said that the knowledge of RDWD business actors regarding regulations related to RDWD is shallow. Interest: the low quality of human resources for RDWD business actors, the low quality of drinking water produced by RDWD, and the low awareness of actors in obtaining business permits closely related to the motivation, ability, and commitment of RDWD business actors. Process: weak supervision and law enforcement ultimately significantly affect the legal awareness of RDWD business actors. Ideology: RDWD's business activities are limited to pursuing optimal production and marketing without paying attention to moral responsibility regarding the quality of the drinking water provided.

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