WATER CONSUMPTION AND WASTEWATER PRODUCED IN TOFU INDUSTRY: EVIDENCE FROM INDONESIA

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INTRODUCTION

In the small, medium, and large-scale tofu industry, large amounts of water are consumed during the process production, which generate large quantities of wastewater and negatively affects the environment (Rahmawati and Puspitaningrum, 2022).

Wastewater is directly disposed of without any pre-treatment first, it causes odor and pollutes water bodies around the industry to settlements far from industrial areas (Wulandari, 2022)

Fig. 1. Tofu wastewater

The aim of the study is to understand water consumption during processing production and understand wastewater generation in the tofu industry

METHODOLOGY

The data collection involved semi-structured interviews and questionnaire surveys carried out in 40 tofu industries in Lampung Province, Indonesia in January 2021.

Furthermore, the data were analysed using a mass balance to determine how much wastewater was generated.

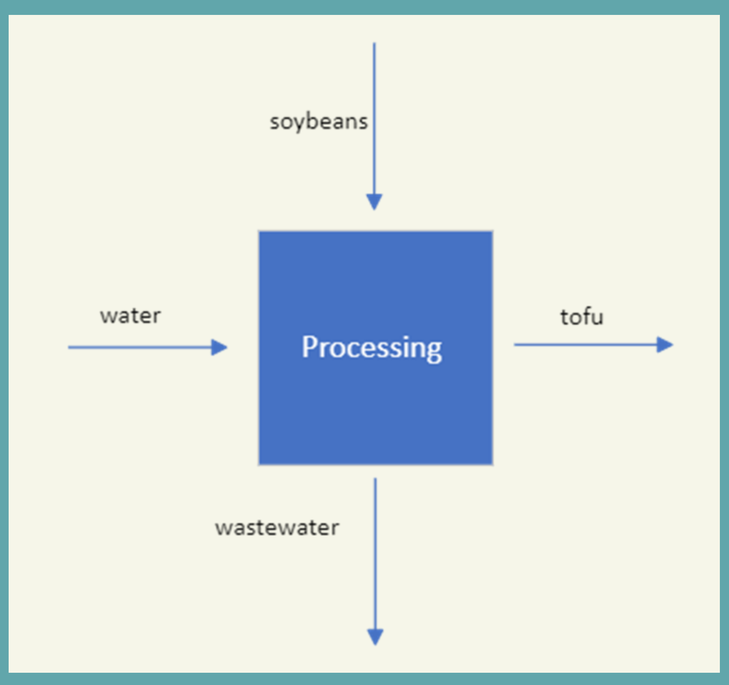

Fig. 2. Mass balance for wastewater in tofu industry

RESULTS

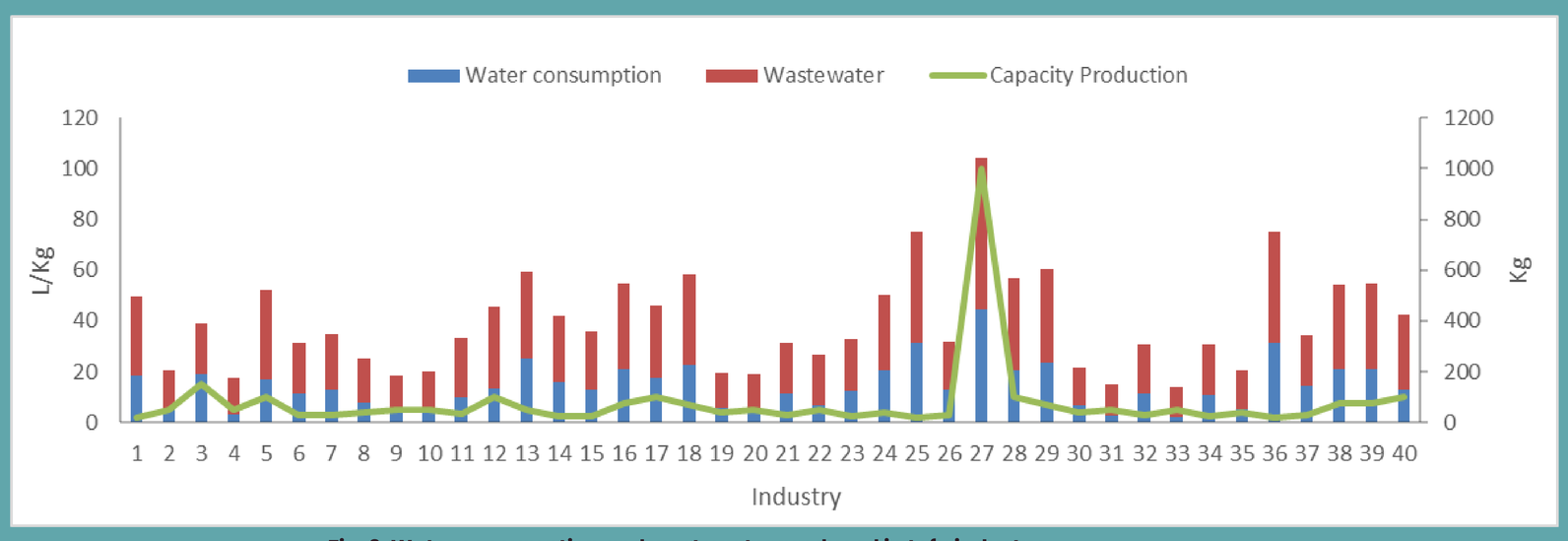

Fig. 3. Water consumption and wastewater produced in tofu industry

Table.1. Wastewater tofu industry characteristic

Parameter	Amount
COD	12400 mg/L
TS	3800 mg/L
TSS	1188.25 mg/L
Alkalinity	280 mg/L
VFA	1500 mg/L
pH	5.17

The water consumption in the tofu industry for processing production is 25.15 L/kg soybeans and the wastewater produced is 14.45 L/kg. So, it can be concluded that approximately 53.38% of wastewater is generated from the water consumed. The wastewater is directly throw to the body water without any treatments cause odor and bad efefct to the environment. However, the utilization of tofu wastewater into biogas can produce methane around 50.17 L/kg soybeans.

Tofu wastewater has high nutrition content which can be utilize as feedstock for biogas, then the biogas can replace the main energy for processing production of tofu such as cooking, grinding and utilities (Yudhistira, et.al., 2018).

CONCLUSION

Tofu industry consume a lot of water for processing production which generate the wastewater which have bad impact to the environment and social aspect. Beside, tofu wastewater still has nutrition content that can be utilize into bio-energy material such as biogas. The COD of tofu wastewater is 12400 mg/l with The calor value is 1.801 MJ/Kg that means the utilization of tofu wastewater into biogas can replace the non-renewable energy like firewood, and LPG (liquid petroleum gas) as main energy for processing production of tofu.

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