

REPORT OF SDGs 6: CLEAN WATER AND SANITATION

**Advancing Clean Water and Sanitation
through Sustainable Practices**



**UNIVERSITAS SYIAH KUALA
SUSTAINABILITY REPORT
2023**

6 CLEAN WATER AND SANITATION



Advancing Clean Water and Sanitation through Sustainable Practices

USK highlights its efforts to maximize the use of renewable energy and reduce reliance on fossil fuel energy sources. USK's buildings are now designed with a green campus concept, with as much lighting as possible sourced from sunlight. Additionally, low-emission energy sources, such as solar panels, have been implemented at the Faculty of Engineering and the Faculty of Mathematics and Natural Sciences (MIPA) to support these sustainable energy goals

1. Water Conservation Program Implementation

Based on the research conducted in the USK Darussalam campus area, to reduce rainfall runoff, it is required to have 2440 infiltration wells with a total volume of 16,000 m³. <https://journal.ipb.ac.id/index.php/jpsl/article/view/40380/25662>





Journal of Natural Resources and Environmental Management
 13(2): 258-266. <http://dx.doi.org/10.29244/jpsl.13.2.258-266>
 P-ISSN: 2460-5824
<http://journal.ipb.ac.id/index.php/jpsl>

The Concept of a Zero Runoff System (ZROS) in reducing the volume of rainwater runoff using infiltration wells at the Syiah Kuala University

Suci Mustia^a, Ichwana Ramli^{b,c,d}, Fachrudin^e

^a Agricultural Engineering Study Program, Faculty of Agriculture, Syiah Kuala University, 23111, Indonesia (+62 651-7553205)
^b Department of Environmental master's Program, Syiah Kuala University, Indonesia
^c Research Center for Environmental and Natural Resources, Syiah Kuala University, Indonesia
^d Biochar and Forest Conservation Research Center, Universitas Syiah Kuala, 23111 Banda Aceh, Indonesia
^e Department of Civil Engineering, Faculty of Engineering, Tonka Unan University, 23081, Indonesia (+62 655-7110535)
^f Aceh Climate Change Initiative, Syiah Kuala University, 23111, Indonesia (+62 651-7553205)

Article Info:
 Received: 12 - 05 - 2022
 Accepted: 12 - 12 - 2022

Keywords:
 Infiltration wells, rainfall, planned flood discharge, surface runoff

Corresponding Author:
 Ichwana Ramli
 Agricultural Engineering Study Program, Faculty of Agricultural, Syiah Kuala University.
 Phone: +6281269000203

Abstract. High rainfall with a very high intensity can cause inundation. The purpose of this study was to determine the magnitude of the designed flood discharge that occurred, and the number of infiltration wells needed to reduce rainwater runoff. This research uses data of maximum 10 years of daily rainfall for observation. The results showed that the rainfall intensity for the 5 years return period was 47.24 mm/hr resulting in a design flood discharge of 2.27 m³/second. The average well water level is 5.08 cm with an average soil permeability value of 3.03 cm/hour. Infiltration wells are designed with a depth of 1.5 m with a diameter of 1.4 m. The use of wells is calculated based on 2 types, type 1 (lined well walls) and type 2 (non-lined walls) in each roof class. The total area of roof covering 15.38 ha requires ± 2.678 type 1 wells, or ± 2.440 type 2 wells which can reduce rainwater runoff by 17% (type 1) or 30% (type 2) of the total flood discharge of the Syiah Kuala University.

However, several other water conservation infrastructure models have been constructed in the USK area, as exemplified below.



The USK campus is located downstream of the Krueng Aceh River Basin which has many water catchment areas. One of the commitments regarding to the water conservation model is the existence of a pond located in the middle of the campus in one of the faculties. In addition, at the location of the USK II campus development, there is a reservoir to maintain the availability of water resources. Rainwater reservoirs with a size of 12 m x 8 m, in addition to rain water reservoirs in each faculty.

The pond is also a place for fish cultivation which can be harvested periodically. Water from the pond can also be a source of water for the surrounding plants. In addition, infiltration wells are also available in several areas within the USK campus. In addition to infiltration wells, students also make biopori. Making biopori is also carried out from student activities every year as The Concept of a Zero Runoff System (ZROS) In Reducing the Volume of Rainwater Runoff Using Infiltration Wells at the Syiah Kuala University Campus.

2. Consumption of treated water

Water from PDAM is processed into water that is ready to drink. There are 2 points, namely the AAC cafeteria and the student dormitory



There is a policy to provide drinking water dispensers in every work room, laboratory, faculty and every event held within the USK environment. The number of active academic community members at Syiah Kuala University on a daily basis is approximately 15,000 people, and the use of treated water through the cafeteria reaches 8,000 people every day (More than 50%).

3. Consumption of treated water



Universitas Syiah Kuala implements water-saving policies by using toilets, sinks, and urinals with automatic faucets or sensor-based systems. The following is usage data in the USK environment.