# ABSTRACT

*Wireless sensor network (WSN) is a set of sensor nodes equipped with wireless communication systems and organized into a cooperative network that is used to capture information in accordance with the desired characteristics. WSN sensor node is composed of small amounts of many (scattered field sensor), which served to detect physical phenomena, data processing, and transmit data. Therefore, energy consumption of WSN is divided into three main domains, namely: sensing, wireless communication, and data processing. Of the three domains, wireless communication is a process that use most of the energy.*

*The problem that most often appears in WSN is the use of energy to transmit and receive data used by each node while the energy of each node is limited. To solve this problems, these routing algorithms are developed, some algorithms or routing method developed is LEACH and EARP.*

*This thesis examines the energy consumption and the network lifetime between two energy-effcient routing protocols WSN-based hierarchy, namely: LEACH and EARP. LEACH is a routing protocol that forms clusters of collection of sensor nodes based on the received signal strength. EARP is one of the development of LEACH protocol. Energy efficiency is measured from the ratio of the amount of data sent per unit of energy. While the network lifetime measured by the duration of the simulation is achieved by each protocol.*

*From the results of simulations and tests performed premises using MATLAB R2013a, showed that the protocol EARP has a larger amount of data sent and network lifetime longer than LEACH. It can be concluded that the EARP protocol is more efficient in terms of energy efficiency and has a longer network lifetime compared with LEACH protocol.*

*Keywords: WSN, LEACH, EARP*