

ABSTRACT

Human activities and rising sea temperatures caused by global warming pose a major threat to the sustainability of coral reefs, where pollution and rising average sea temperatures can directly cause coral bleaching, which can lead to the mass death of coral reefs. This is evidenced by the condition of the coral reef ecosystem in the waters of Gili Matra in 2016, an increase in temperature resulted in 50% of coral colonies experiencing bleaching (coral bleaching), while 11% of coral colonies were found in pale conditions and there was coral colony mortality of 1% of coral colonies affected by bleaching. With the threat of massive damage due to environmental damage and global warming, of course, prevention efforts by means of cultivation carried out in controlled media and isolated from the open ocean are one alternative. When compared to coral reef cultivation in the open ocean, isolated coral reef cultivation in aquarium culture media has advantages in terms of control because water quality can be carefully controlled. Coral reef rehabilitation efforts through aquaculture can be done with coral transplantation methods. Coral transplantation is a method of planting and growing coral colonies by fragmenting coral colonies and then placing colony fragments in controlled cultivation media. With the Internet of things-based controller device, users can access water parameter information and control life support instruments such as dosage and scheduling of supplementation pump activation, scheduling of photosynthetic lamp activation, top up pump activation, cooling fan activation, return pump activation, scheduling of current pump activation that meet the living and growing conditions of coral reefs. The results obtained by the coral reef cultivation media controller system show the scheduling of photosynthetic lamps that are consistent according to the specified profile, the dosage of the supplementation pump which has a maximum deviation of +- 1% - 2%, activation of the top up pump on the water level sensor signal, scheduling and duration of the current pump with a maximum deviation of 1s duty cycle, and preparation of media water with parameters close to natural levels with test results of alkalinity of 8.3Dkh, calcium 420ppm, magnesium 1050ppm, and salinity of 1025 spesific gravity.

Keyword : Coral Reefs, Coral Fragmentation, Firebase, Arduino Nano, Android, Flutter