**CHAPTER 2. INTRODUCTION TO SMART GRASS CUTTER**

**2.1 PROBLEM DEFINITION**

A Smart Grass Cutter is a machine that uses a revolving blade or blades to cut a lawn. Lawn mowers employing a blade that rotates about a vertical axis are known as rotary mowers (blade rotates horizontally).Many designs have been made, each suited to a particular purpose. The smallest types, pushed by a human, are suitable for small residential lawns and gardens, while larger, self-contained, ride-on mowers are suitable for large lawns, and the largest, multi-gang mowers pulled behind a tractor, are designed for large expanses of grass such as golf courses and for parks.

* **The problems with available grass cutter robots are as follows:**
* Power consumption: The available grass cutter are electrical powered which will consume large amount of conventional energy source.
* Human effort: The mowing work always needs to get control with a worker for the proper mowing.
* Time consumption: For mowing the land in different patterns and design it takes larger time and human effort
* Safety.
* Classical grass cutters with heavy engines create noise pollution and local air pollution due to the combustion in the engine.
* Fuel powered engines require time to time maintenance such as changing the engine oils etc.
* If the electric grass cutter is cord type, to use it could prove to be problematic and dangerous.
* Moving the grass cutters with a standard motor is inconvenient, and no one takes pleasure in it.

**2.2 AIMS AND OBJECTIVES**

The objective of the proposed work is to design and construct the smart grass cutter. It is a fully automated grass cutting robotic vehicle. It also avoids obstacles without the need of any human interaction. The system uses batteries to power the vehicle movement motors as well as the grass cutter motor.

* To reduce power consumption and time consumption.
* To reduce human effort.
* To reduce noise and air pollution.
* The self- powered objective is to come up with a cutter that is portable, durable, easy to operate and maintain.
* It also aims to design a self- powered cutter of electrical source, a cordless electric grass mower.
* To implement agricultural automation.
* To enhance safety.

**2.3 SCOPE OF THE PROJECT**

The grass cutter and vehicle motors are interfaced to Arduino that controls the working of all the motors. It is also interfaced to an Ultrasonic sensor for object detection. The Arduino controller moves the vehicle motors in forward direction in case no obstacle is detected. On obstacle detection ultrasonic sensor monitors it and the controller thus rotates the grass cutter motor so as to avoid any damage to the object/human/animal. Controller then moves the grass cutter in forward direction again.This project aims to make a daily purpose robot which is able to cut the grasses in lawn. The system will have some automation work for guidance and other obstacle detection.

**2.4 FEATURES OF THE PROJECT**

* Easy to move from one place to another place.
* Compact size and portable.
* Operating principle is simple.
* Non-skilled person also can operate this machine.