Chapter 6

Weed Control System

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Weed Control System

6.1 Introduction

Weed control is a major part in tea industry. Any plant unwanted in a field is regarded as weed. Weed control measures are either manual or chemical. Manual weed control in tea is expensive and limited to uprooting of rank/stubborn weeds, seedling and cheeling. Chemical weed control is more efficient and economical in the long run. It improves the tilth and encourages feeder roots to grow in the surface layer of soil. In this chapter, a GIS based weed control system for tea garden has been proposed [2, 41]. The system takes data related to ongoing practice of tea gardens on different types of weeds, stores these data to a database and helps the management to take decision to use appropriate herbicides with correct doses using GIS approach

6.2 The Scheme

The proposed system is divided into different phases:

Step-1

Tea garden maps are collected and scanned first. Digitize the raster image/map on section layer. In this paper, a scanned map of Phuguri Tea Estate, Mirik, Darjeeling has been considered and processed as mentioned for the implementation but map of any tea garden can be incorporated into the system.

Step-2

Create an Oracle database to store the data of different weeds and approved herbicides from the tea garden. The structure of the database and its attributes has already been described in chapter 3.

Step-3

Forms have been designed using java swing to input/output data into the database.

Step-4

A relation between the digitized map on section layer and the database has been established in such a way that a GUI based software is created and one can get previous information or any other information on pest attack by clicking on any section of the digitized garden map and it may be used as a decision making tool for a tea garden. Figure 6.1 shows the context diagram. Digitized map is taken here as input to the system and it generates the weed control management system.

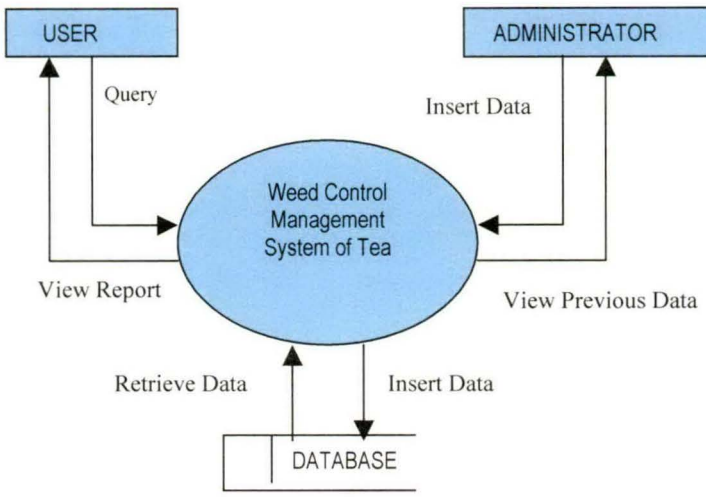

Figure 6.1: Context diagram of the weed control management system

6.3 Results

Figure 6.2 shows the input form for the insertion of the records related to the weed control management. The form gives the image of the section along with its area and section code. It also gives the details of the last herbicides used for that particular section, that is, the date of the last spraying, the time of application and the herbicides

used along with the quantity of the herbicides used for that section. This portion of the form chooses the details of all applying periods for which spraying was done on that particular day. The names of all these are selected into a combo box and then depending on the choice selected from the combo box the details of the spraying done to control weeds is shown in the respective fields. The lower portion of the form provides the user with the option to enter the details of the current spraying session for the particular section.

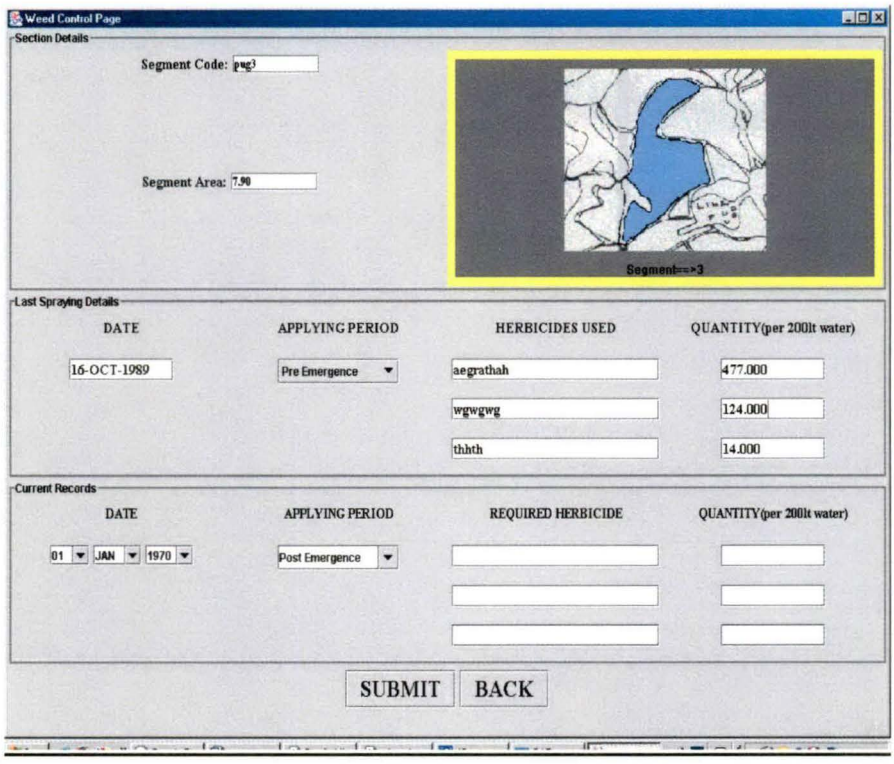

Figure 6.2: Insertion form for Spraying Data with previous data for last spraying date

Figure 6.3 shows the details of the spraying done, for all the sections in the garden throughout the entire year, in the form of a report, that is it gives the segment (section) code, the segment (section) area, the date of spraying, the applying period and the herbicides used along with the quantities used per 200 liters of water, the number of workers who were engaged in spraying and lastly any comments if any for that section on that given date.

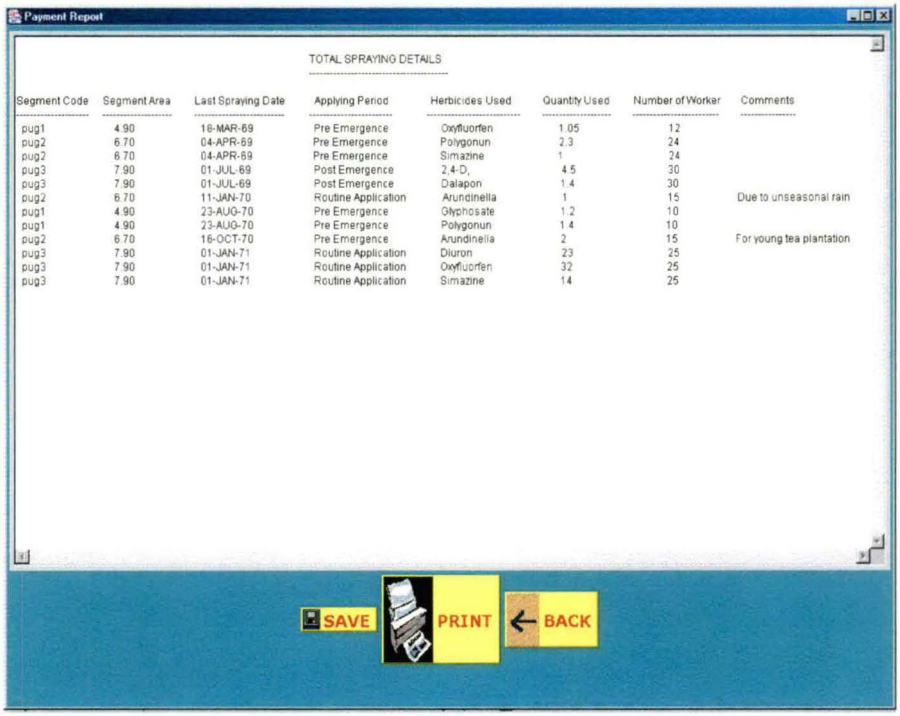

Figure 6.3 Total Report form for Spraying Data

From the report displayed in figure 6.3 the management can easily take decisions for the next spraying scheduling to get better result with minimum cost.

A database management system with GIS technique for weed control management in tea garden is presented here in an efficient and cost-effective manner. One of the major task in the tea gardens are job scheduling with respect to manuring which is very difficult in manual system. This has been proposed to replace by automated house keeping and monitoring of data.