Prospects of Designing a Prototype for District Level Rice Production Information System (RPIS)

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Abstract: -For agricultural and rural development, Information and Communication Technologies (ICTs) are critical in facilitating communication and access to information. Agriculture is a national priority sector, thus it's one of the areas where ICTs could be used to help with economic change. People in poor countries who rely on high-quality agriculture to meet their nutritional needs have a dilemma as the world's population continues to grow. All agricultural development policies in Bangladesh emphasize the importance of achieving security and food self-sufficiency through hedging rice needs. Food security is also addressed through teaching farmers to become self-sufficient in order to protect local resources efficiently and optimally. Many projects and activities have been initiated in this area to address the rice shortages on which the country is heavily reliant. In such area, there are a lot of partners and players. The goal of this research is to provide an information management solution for the rice industry, as well as to model database dispersion of rice data. This supports the presence of a large number of data sets, each of which is owned by a separate department at the state level, as well as donors and other stakeholders in the sector. Indeed, much of the information gathered is shared between initiatives. It indicates that avoiding the duplication of numerous investigations and ensuring improved data management, as well as limiting major financial losses, are both necessary. As a result of the investigation, it was discovered that there are multiple interdependent relationships in the rice sector. Unfortunately, communication between the various stakeholders in the sector is challenging. This industry does not have its own information system. Implementing a rice production information system that provides users with trustworthy, relevant, complete, and useable data is now critical. Thus, the research prospects in the implementation of a plan for acceptable solutions for the use and management of agricultural data is underway Rice Production Information System (RPIS).

Keywords:- District, Agricultural Database, Rice, ICT for Agricultural Development, Web.

I. INTRODUCTION

Bangladesh depends mainly on agriculture. It has an area of 147570 km2 and a population reaching nearly to 176.7 million with the density of about 928 persons per km2 which is one of the highest in the world. Agriculture is a dominating sector of 'the country. The Agriculture sector contributes 21.84 percent of Gross Domestic Product (GDP) [1]. This sector is also being considered as the single largest contributor to income and employment for the general people of Bangladesh. Among them, Rice is the main cereal of Bangladesh agriculture providing about 70 percent of total calorie intake for the people particularly for hard working people. Rice is the staple food for general people in Bangladesh. Rice occupies roughly 10 million hectares of land, contributing for 75 percent of all agricultural crops and 93 percent of all cereals grown. Rice farming is by far the most important source of employment in rural areas[2].

On the other hand, for agricultural and rural development, ICTs are critical in promoting information exchange access. Farming is one of the potentially opportune regions for the application of ICTs for financial change because it is a national need portion. The utilization of low-cost ICTs and the development of networks improve quick access to precise and dependable data. It so necessitates the investment of a portion of the country's limited resources on ICT progress. In Bangladesh, Many projects and programs have been established to address the country's rice needs, which are heavily reliant on exports. There are also a lot of collaborators and performers in that area. This supports the presence of numerous data sets that are controlled by various departments at the state and federal levels, as well as donors and other stakeholders in the sector. For sure, a great part of the information gathered is regular to various tasks. It appears that avoiding the recurrence of numerous investigations and ensuring better data management is required in order to limit major financial losses. It often showed up as significant speculations are associated with information accumulation that had just been finished or was in advance [3].

Unfortunately, communication between the various stakeholders in the sector is challenging. There is no information framework to this division. The usage of a rice production information system to give clients dependable, pertinent data, full and usable is right now essential. It must be able to quickly identify data-related paperwork. It should also be possible to search for data using query and retrieval criteria. As a result, the installation of a Rice Production Information System (RPIS) with a web interface for remote access [4] aids tofind suitable solutions for the use and management of these projects. Indeed,

the development of a reliable database and the integration of all necessary data into a single application are essential. project minimized data redundancy and delay calculation error. This RPIS will enable for real-time analysis of rice production, varieties used, cropping system yields, and other factors from each location. The benefit of an information system is that it can be used for more than just database creation rather than to structure relational database management information so that it may be queried according to themes and scales of analysis and made available to a variety of users. Managers can plan, control, and assess the effectiveness and efficiency of research operations using a management information system. Many national and international organizations deal with data on current agricultural projects in developing nations, as well as the complete agricultural research system. Knowing what knowledge is already available allows for more efficient resource allocation and minimizes duplication of research efforts in solving challenges[5].Given the rice datasheet, The approach taken is that of a database management system (DBMS), which allows for the quick extraction of required data and responses to well stated objectives.

II. RELATEDLITERATURES

The government of Bangladesh, with support from UNDP initiated ICT-based information services for rural communities which have become an increasingly prominent feature of urban and rural life in Bangladesh. IT-enabled services (ITES) have in part been kickstarted by the government's vision of 'Digital Bangladesh 2021', which aims to utilize ICTs to affect a greater pace of change in poverty reduction and improve governance [6].

In this connection, [7] conducted a research on topic "Developing an agricultural database in Malawi" and the author described the The successful establishment of a computerized database using Mini-micro CDS/ISIS software, as well as the methods of soliciting donor funding in order to obtain microcomputer capacity in the Faculty of Agriculture Library, University of Malawi.

A research work was also done by [8, 9] by name of project named "Development of a GIS for the management of the rice sector In Côte d'Ivoire: a platform for exchanging information and spatial analysis". Author stated that The number of data created by the rice sector is increasing, and the rice industry's operators are a series of interconnected links. As a result, the creation of an appropriate management tool is required to organize and disseminate information that may be used to make decisions. The study also advocated creating a tool for rice data management and modeling the spatial distribution of rice data.

In the Sawah Sampan rice-growing area in Tanjung Karang, Selangor, Malaysia, an interactive, web-based GIS delivers information for precision farming and mapping [10, 11]. Farmers can use the system to get information about rice cultivation in their area.

However, a research study also conducted on "Agricultural information systems and communication networks: the case of dairy farmers in the Samsun province of Turkey" during 2008 where author described Components (subsystems) and information-related processes make up an agricultural information system [12, 13]. This method can also be used to detect potential defaults and improve component coordination (e.g., information management).

III. RESEARCH METHODS

First, we must collect the names of all Thanas in Tangail district through field visits, as well as pertinent rice production and rice area data sheets, before proceeding with the following design procedure:

Step 1: Create a conceptual database structure (identification MDB of tables, keys, relationships)

(a) Make a list of all the fields of interest and determine how the information is organized.

DISTID I DISTID (ii) DISTID (ii (distinguishing proof number of District - Integer)

DISTNAME (ii) (name of district - character)

YEAR (iii) (integer)

(iv) RICEKA (number of acres planted with rice during the kharif season) (v) RICERA (area under rice in rabi season - number)

RICEKP (v) RICEKP (vi) RICEKP (vii) (production of rice in kharif season- number)

RICERP (number vii) (production of rice in rabi season - number)

(b) Sort data fields into tables based on their themes.

Based on the two data themes – districts, area, and rice production – two tables will be required. The fields THANAID and THANANAME will be found in Table 1 of the districts table. Table 2 contains the fields THANAID, YEAR, RICEKA, RICERA, RICEKP, and RICERP, as well as the area and output of rice. The common field between the two tables will be THANAID.

(c) Determine which tables are primary and which are linked.

Table 1 will be the primary table because the data on rice area and production is about Thanas. Table 2 will be a companion table including data on rice production and area in Thanas over the years.

(d) Recognize the keys in each case.

Step 2: Open MS Access and create a database file

(i) I make an empty database file called APRICE. APRICE.MDB is the name of the file with the.MDB extension.

Tables are created in the third step (a) 1st Table: Design and construct the table below, which includes two fields: DISTID and DISTNAME. APDISTRICTS should be the name of the table.

Step 3: Creation of tables (a) Table 1: Design and create the following Table with DISTID and DISTNAME as two fields and Save the Table with the name APDISTRICTS.

(b) Table 2: Create a second table with data from the kharif and rabi seasons' annual rice area and production. The fields in the table will be as follows: NO, DISTID, YEAR, RICEKA, RICEKP, RICERA, and RICERP are all acronyms for rice. The primary key field will be NO.

Step 4: Forming Connections
Create the database associations between the two tables APDISTRICTS and APRICE.

Creating shapes is the fifth step.
Create two forms for entering rice production and area

data: FORM1 for production data and FORM2 for area data.

Step 6: Entering data I Using the PRODUCTION DATA form, enter production data from the Tangail district datasheet into table 2 (APRICE); (ii) Using the AREA DATA form, enter area data from another datasheet into table 2 (APRICE).

Step 7: Run a query to get rice yields and sort them by district Thanas.

Step 8: Gather information for reports: Prepare a graph depicting the results of the query for rice kharif and rabi productivity trends by Thana in Tangail district (Yield vs year).
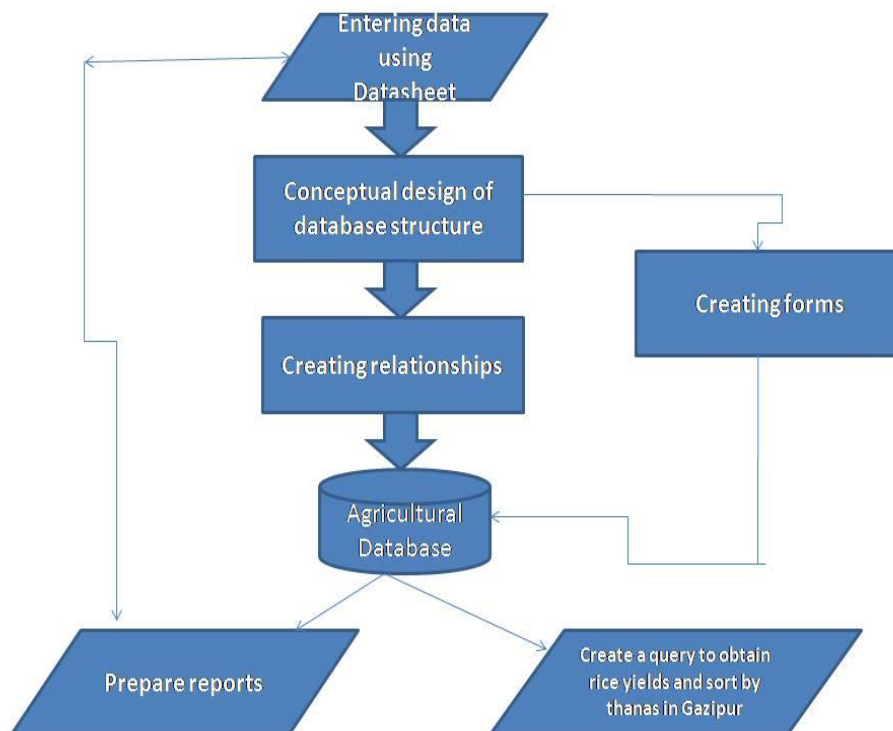

Fig. 1: RPIS Web Interface

Fig. 2: Flow chart of Rice Production Information System (RPIS)

IV. RESULTS AND CONCLUSION

Findings to facilitate the storage and management of appropriate rice data in order to meet the need for information management in the rice sector in Tangail District. The created prototype provides a flexible structure and can therefore be modified according to future needs. Developing a web-based monitoring system that calculates rice area, yield, and production accurately. The detection of chances for regular data updates will enhance the database and provide a successful management tool to assist the evolution of a crop yield inventory and their assessments for improved project distribution in Bangladesh. Easily Applicable database for decision making process for farmers, managers, developers and policy makers. The need based rice data and information for the farming Communities.

It can assist in decision making process through getting the percentage of rice production with relevant yield depending on various region and different year. It also enables farmers to analyze and reflect on the best strategy for the coming growing season. It provides farmers and extension workers with a simple and strategic decision tool for rice plantation management and hence improves the capacity to access and exchange information for rice crop monitoring, and to turn it into useable knowledge, which is critical for achieving the development goals of poverty eradication, food security, long-term development, and greater productivity and competitiveness. A well-designed system may eliminate redundancy and duplication of data and efforts while also ensuring maximum coordination among agricultural institutes, programs, and personnel for the purpose of agricultural progress and food security. Policy-makersable in agriculture and rural development decision making and hence it strengthens rural communities and promotes agricultural socioeconomic development.

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