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Information System for Data Collection on Socio Economic Status of Livestock Farmers

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ABSTRACT: India is having the highest livestock population in the world. Livestock farming contributes 4.11% of GDP and 25.6% of total Agriculture GDP and it is a source of employment to 8.8% of the population. Exponential growth in this sector attracts attention towards proper planning and management. We need to collect data from the block level to analyze and predict changing patterns of socio-economic aspects of livestock farmers in order to implement proper policies. Information Technology plays an important role in obtaining relevant, reliable, and timely useful information, therefore the need for Information systems arises to organize and analyze data in a simple manner. The presented information system has been designed to cater to the needs of research organizations, private livestock farming businesses, extension workers, and farmers themselves. The interface is simple to use and basically focused on collecting and predicting accurate and specific information on the socio-economic status of livestock farmers. The technology used is compatible with all versions of windows with a graphic user interface designed in Java Net beans 8.2.0 and a database in My SQL. The database can be imported in any other RDBMS, spreadsheet or analysis software such as SPSS.

KEYWORDS: Database, Extension planning, Information system, Livestock farmers, socioeconomic aspects.

I. INTRODUCTION

India is among the largest milk-producing countries in the world, with 198.4 million tonnes of milk production in 2019-20, as per the economic survey report [1] having 125.34 million milch animals and near about 535.78 million livestock population as per 20th livestock census 2019. The livestock sector employs 8.8% of the population in India. It is the most significant source of livelihood to two-third of rural India and contributes to 5.1% to G.D.P.; [2]. Livestock management is good practice for doubling a farmer's income having marginal landholdings; also, it is the major contributor to a family's income during disasters like drought, flood, pest problems, pandemics, etc. In India, the major chunk of livestock farming belongs to the unorganized sector of farmers with marginal landholdings. This unorganized sector has great potential for improvement and progress if guided and implemented with proper planning and management techniques.

Since the last decade, different stakeholders, including researchers and farmers, have been availing many sources of knowledge and information from print and television media, digital information via interactive voice systems, web-based portals, databases, and mobile applications related to agricultural and livestock practices. These services are provided by government or non-government organizations freely, such as Disease control app, Vaccination guide, Poultry disease centre & Parasite control in farm animals by IVRI, Izzatnagar, and buffaloes by CIRB, Hisar. Some commercial/paid services are also available for livestock businesses but not suitable for small farmers. Farmbrite [3], CattleMax, and Agriwebb are a few customized paid commercial applications available to maintain complete farm/livestock resource management. The users can track the cost of production, identify trends, and gain valuable information to increase efficiency and profits in livestock farming or agricultural business. Another commercial product is Farmtree; it consistently tracks Milk productivity and improves breeding performance. It tracks various farm dynamics like Farm Expenses, Cost of Feed and its Performance, Milk Performance, Per Litre Production Cost, Breeding Performance, Days of Peak Milk, Monthly Profitability, among multiple other factors which make a difference. We couldn't access the variables fully tracked by this software, as these are not freely available.

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Besides the above-mentioned software, several researchers from various institutes developed agriculture and livestock-related information systems to record data to retrieve useful information and predict patterns for better management and profit. One such web-based agriculture information system for the crop, diseases, and soil-related information was designed [4] with a front end in java and backend using oracle versions. The advantages of herd management software regarding breeding, pedigree, individual records, feeding milking, etc. was narrated [5]. Production and reproduction data management of dairy farms was developed "C.O.P. & R.G." using Fox-Pro applications [6]. For non-epidemic veterinary emergencies, SIVENE, a real-time decision support tool for emergency response during disaster management, was developed using RDBMS Oracle 11 g, J2EE, Spring, and MyBatis technologies in Angular4 framework using TypeScript language and geodatabase in Oracle RDBMS 11 g [7]. OIE-WAHIS information system was launched to track animal health and disease outbreaks [8]. Such information systems are collecting and disseminating animal-specific, health, or disease monitoring information.

In India, there is still a need to work upon ground realities from village to district level to collect actual data so that to maximize efforts to monitor and improve the farming and livestock practices. There is a need to collect, process, store and predict patterns related to the socio-economic profile of farmers from the local to the national level to utilize the information by extension workers for research, planning, and management.

This information system is designed to cater needs of extension workers and researchers to gain insights into the socio-economic profile of farmers, the types of farm equipment used; the number and breed of animals, and other livestock practices being followed in the particular region. This database helps aggregate the socio-economic profile of the farmers and their livestock-related information in one place to examine the strength and weaknesses of farmers' practices. It is easier to cross-reference and observe trends for better supervision in livestock farming practices. Overall it is fast and cost-effective means of data management, an effective tool for proper decision making, planning and, users can interact with voluminous data to retrieve various information with ease of data analysis, integration of data with other analytical software.

II. MATERIAL AND METHODS

Primary data collection

For preparing an information system on socio-economic aspects of livestock farmers, a questionnaire was prepared in Microsoft word to collect data by survey/manually. Observations from prevailing real-life practices, actually available infrastructure and were included. The information can be collected from any block/village level and entered into the database via an interface.

Technology used

To design and implement the graphical user interface, the technology used is JDK 1.8, JDBC-4.2, Java NetBeans 8.2.0 IDE swing components. This is robust, platform-independent technology; the backend is supported by My SQL version 8.0.15. Middlewares for data connection is MySQL Connector Java-8.0.13 and MySQL Workbench to design table for storing information in respective fields.

Database Setup

1. Installed MySQL server and Workbench first.
2. Created a database "mydb."
3. Created tables "basic_details", "education", "family_details" , "farmingequipment" and many more with appropriate validation checks.
4. Insert related fields/columns in tables.

Connecting with Database

In order to connect our java application with the MySQL database, we need to include JDBC Driver, which is a J.A.R. file. Download the J.A.R. file and add it to the project classpath. In this project, we no need to register JDBC Driver because Java 1.6 and JDBC 4.0 API provide a new feature to discover java.sql.Driver automatically. It means class.forName() is no longer required. The general architecture of the database is given in figure1

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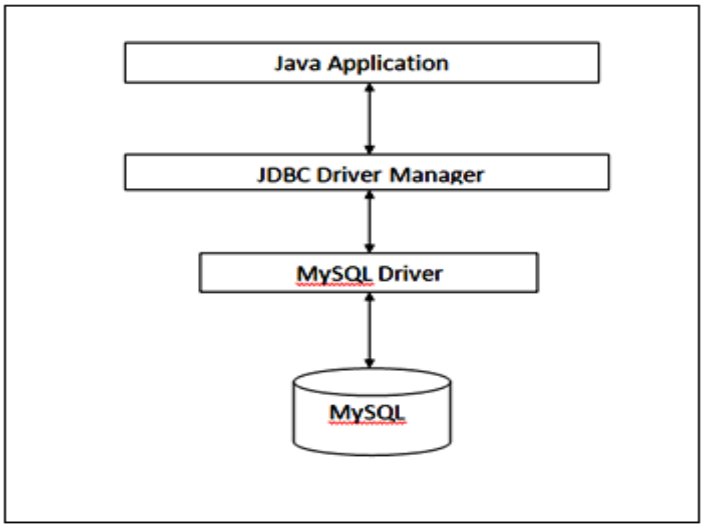

Figure 1:. General Architecture of database

III. RESULTS AND DISCUSSION

This tool can be used for capturing data by running jar files on any system with minimum requirements, as shown in figure 2. It is secured, uses authentication at the primary level. The first form is the login form that prompts the user to enter login Id and password to open the software/ database securely, as shown in figure 3. After successful login, the second form appears with a rich text interface that captures the general details of farmers related to their socioeconomic profile. The information is captured with proper validations; after saving the data, the user is asked to move to the next form and so on, as shown in figure 4.

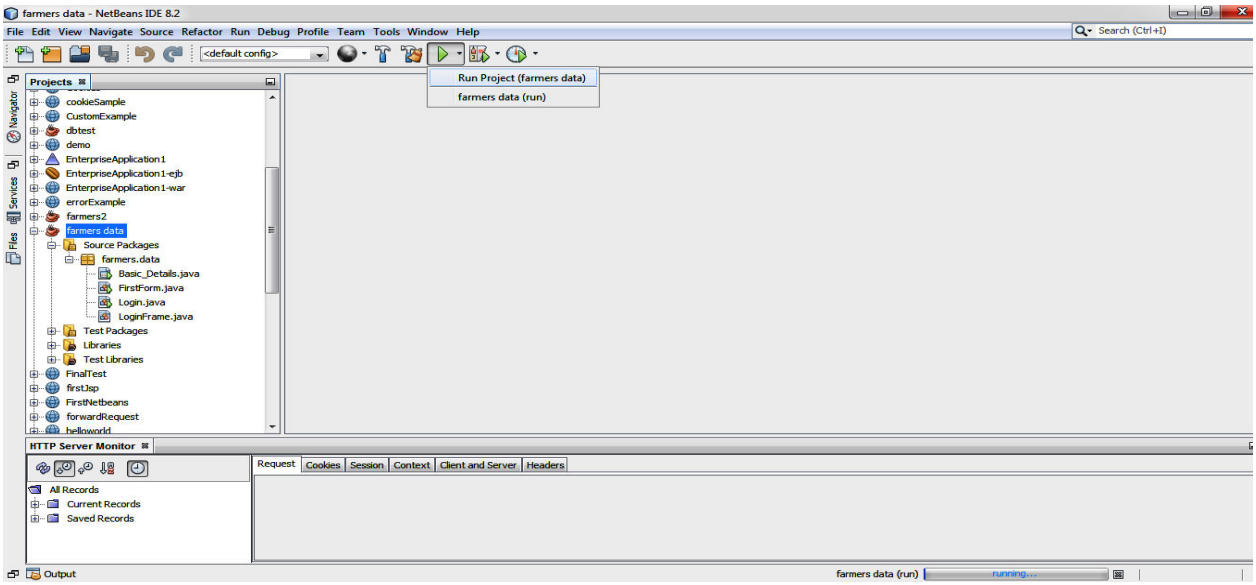

Figure2: Run the jar file

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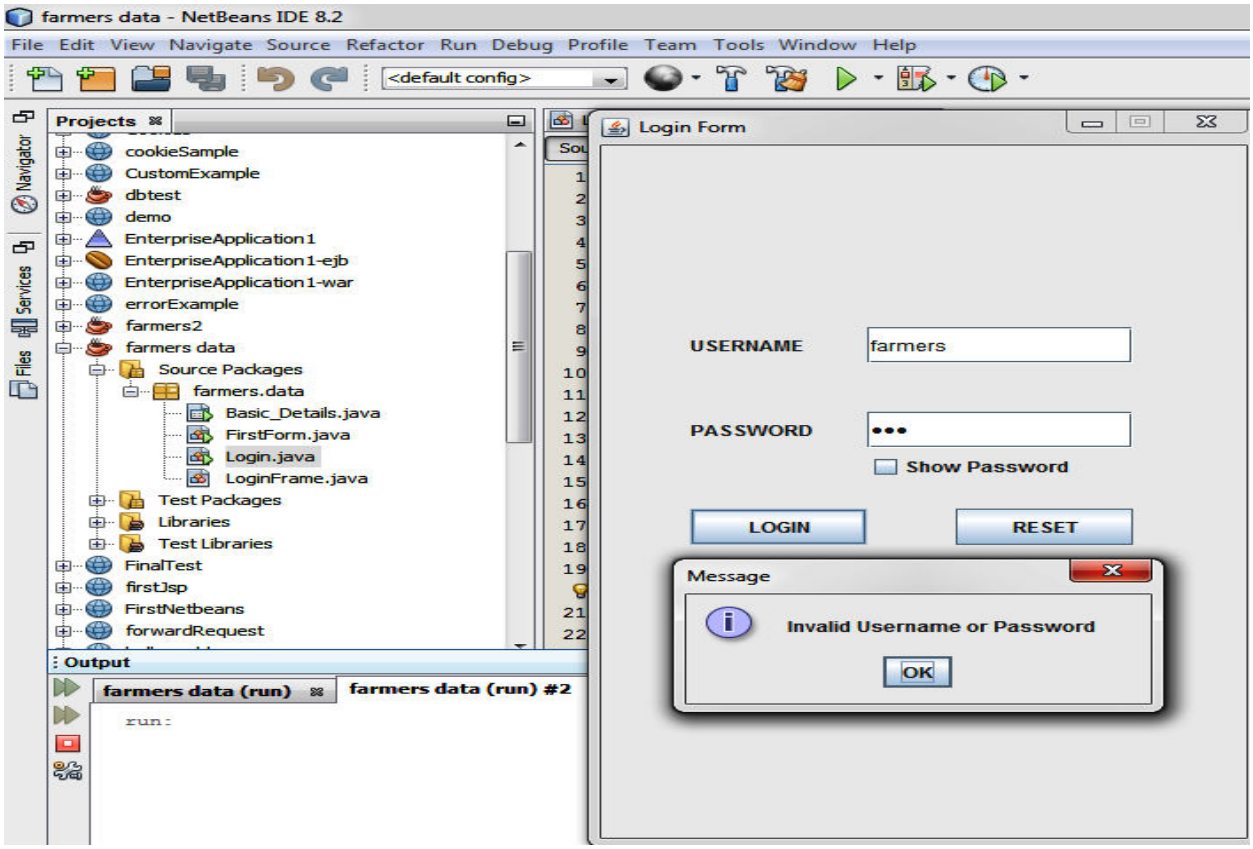

Figure 3: Login details of the farmers information system

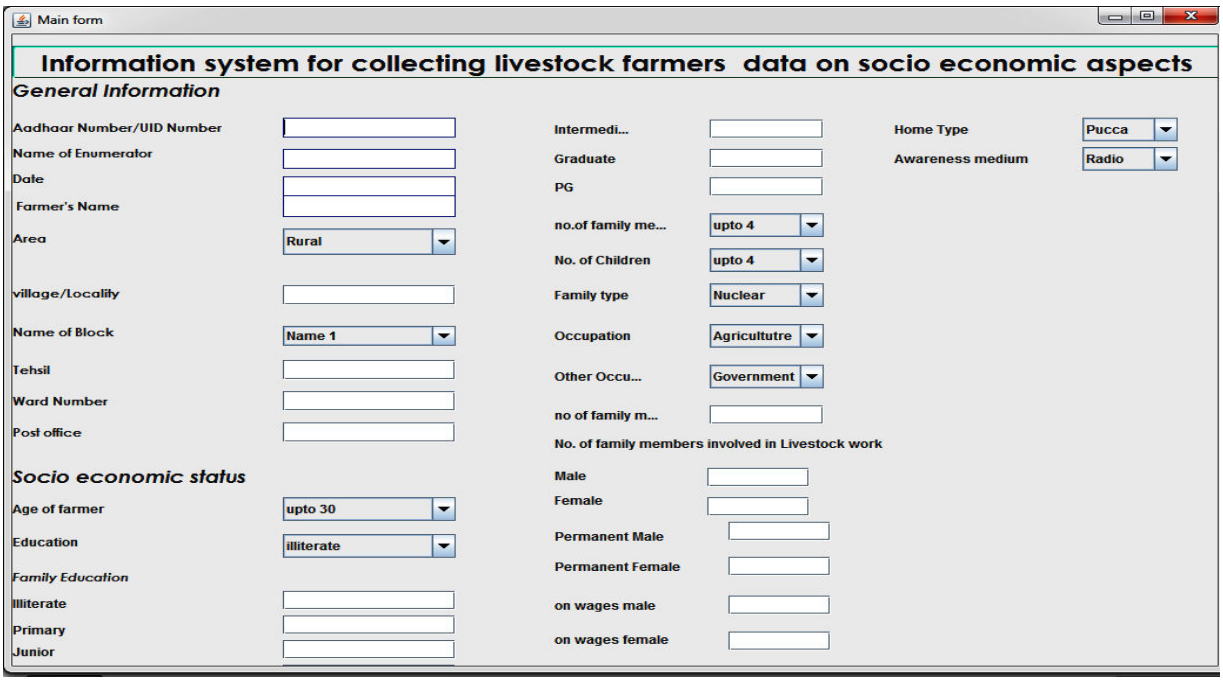

Figure 4: Main form capturing general socio economic parameters of farmers

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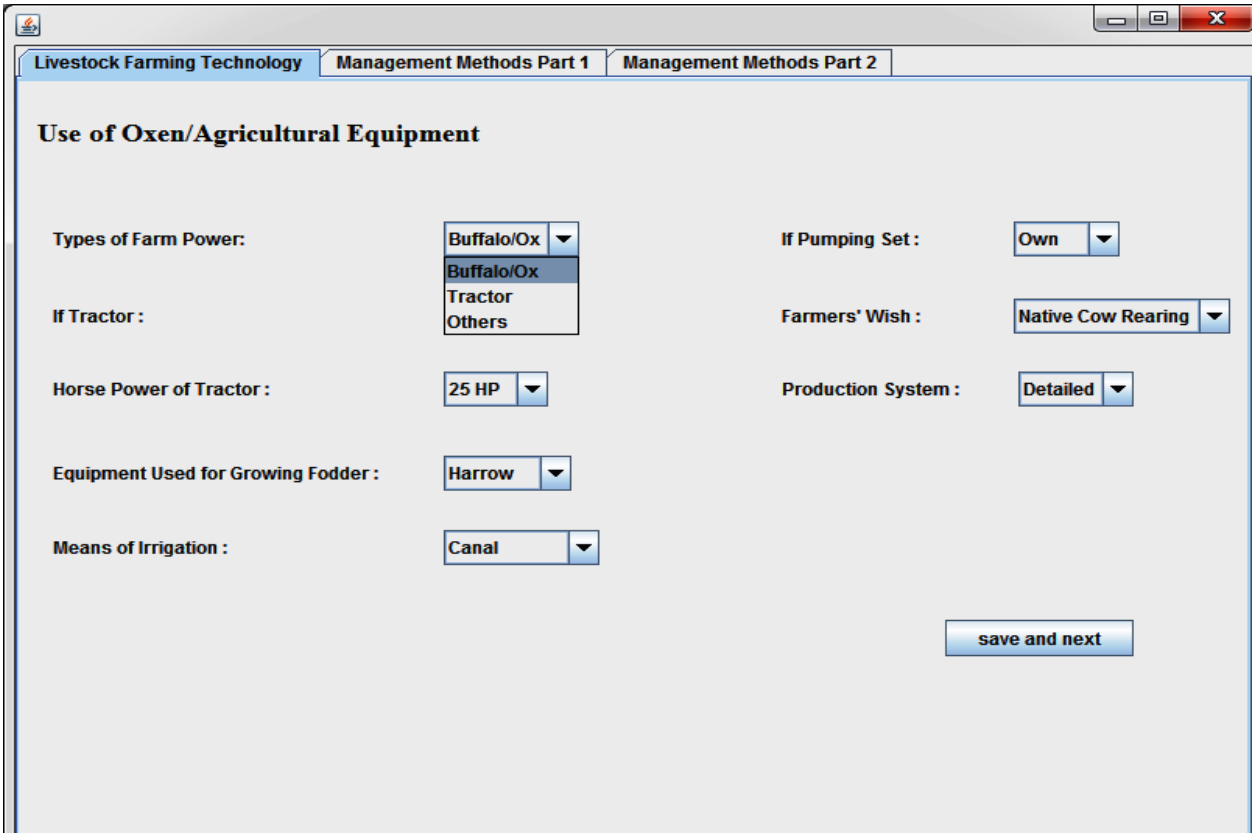

Figure 5: Second form storing agricultural equipment details

Figure 5 shows the interface that enables to store of data related to livestock farming technology used by farmers. This farm equipment-related data may help capture and analyze information related to the socioeconomic status of livestock farmers. After this, the form shown in Figures 6 and 7captures data related to newborn cattle hygiene maintenance practices followed by milking and feeding details. An Accounting Information System for cattle feed control was proposed [9] to maintain only the accounting information of feed by manager, breeder, and supplier to obtain the maximized profit. The data captured in Yes/No options from the combo box is saved to the database in numeric form as 1 or 2 to analyze by any statistical software. From this data, we can observe the percentage of farmers following scientific or traditional practices and the gap of various parameters, if any. The data saved via an interface to the backend can be imported to any database, and based on certain queries, we can obtain information, as shown in Figures 8 and 9.

This information system can be used to examine the current status, practices being followed by farmers and find out the scope of improvement and predict the future requirements. One such herd management information system (centralized database) for population research was developed [10]. Using JSON API and MySql database technology, a beacon information system was designed to identify the behavior and well-being of cows [11].

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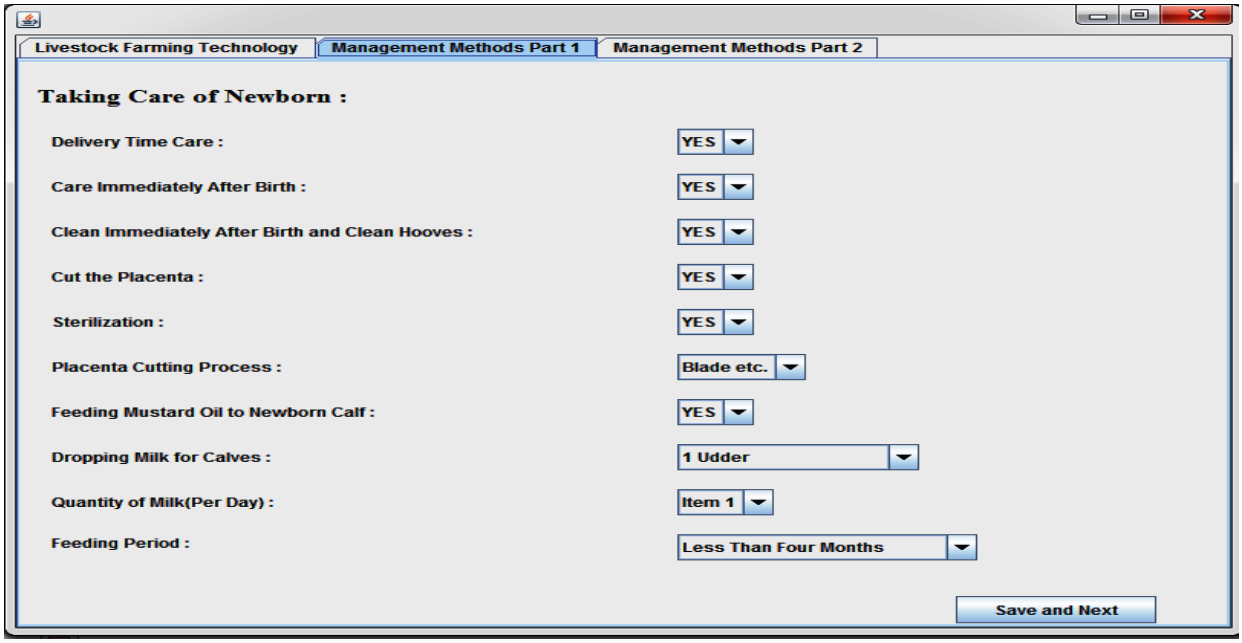

Figure 6: System capturing and saving newborn calves caring /practices methods followed by farmers

This information system can be updated to store vaccine, and disease-related databases as one such system were developed for storing information about milking dairy cattle and mastitis detection using ZigBee WSN communication system GUI interface with code written in C/C++ and database in MySql [12]. A dynamic object-oriented database was developed [13] in Indonesia to update the scattered information of livestock-related details like maintenance, health records, and disease prevention, etc., dynamically.

This information system can help gather information about livestock farmers and correlate their socioeconomic status, the practices followed by them, and the scope of improvement.

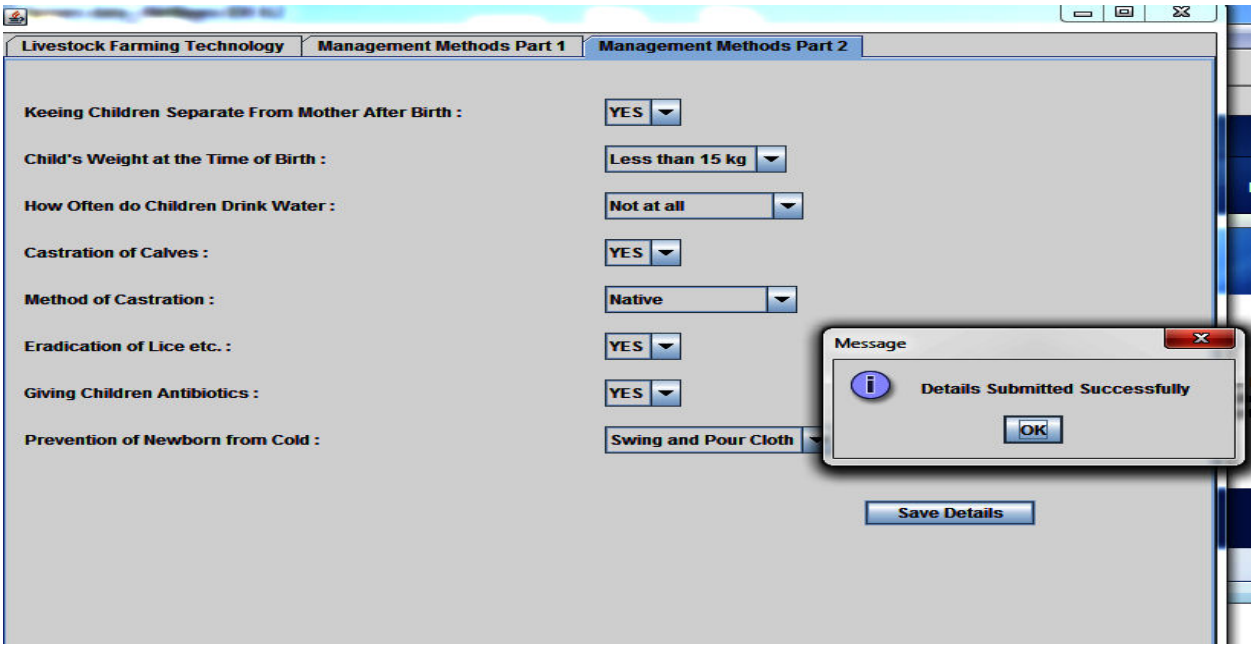

Figure 7: Other many details saved and captured for socioeconomics analysis.

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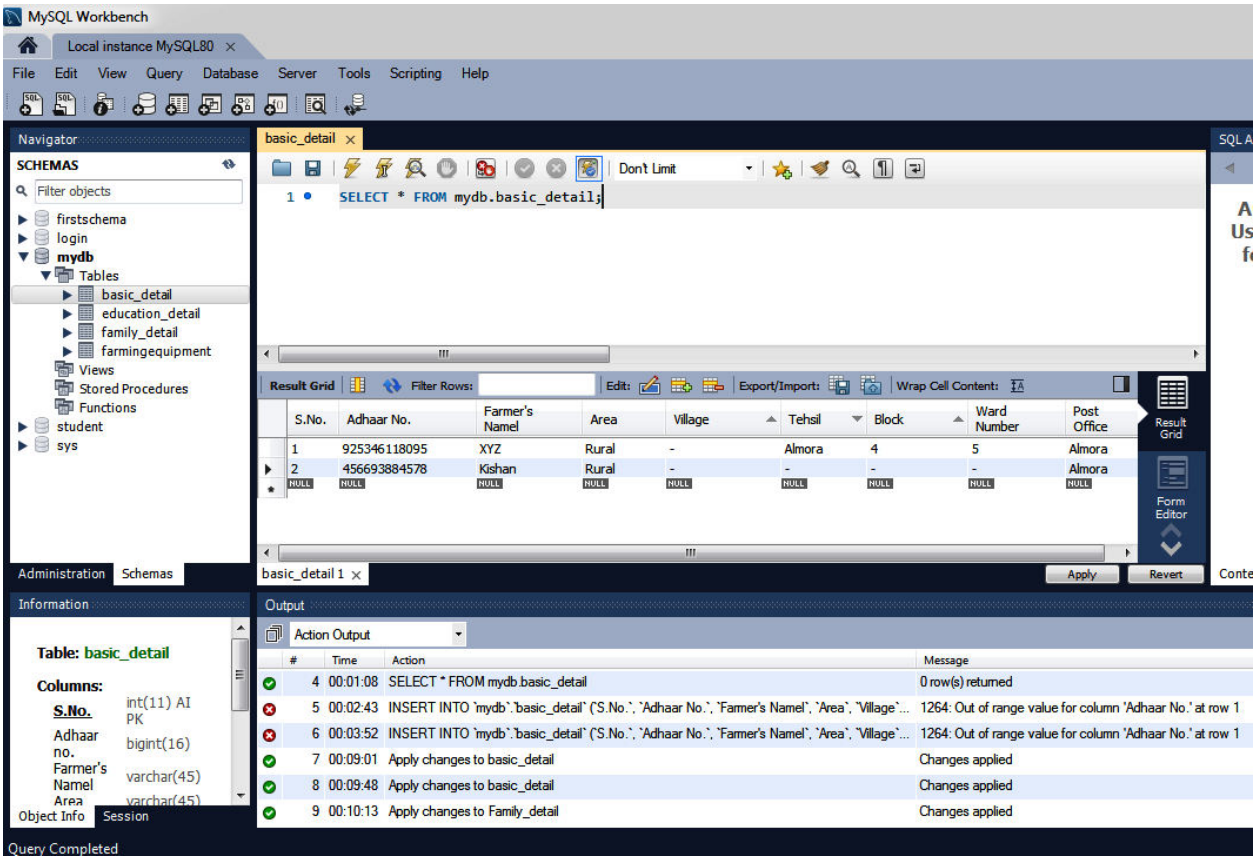

Figure 8: Table showing captured basic details based on a query

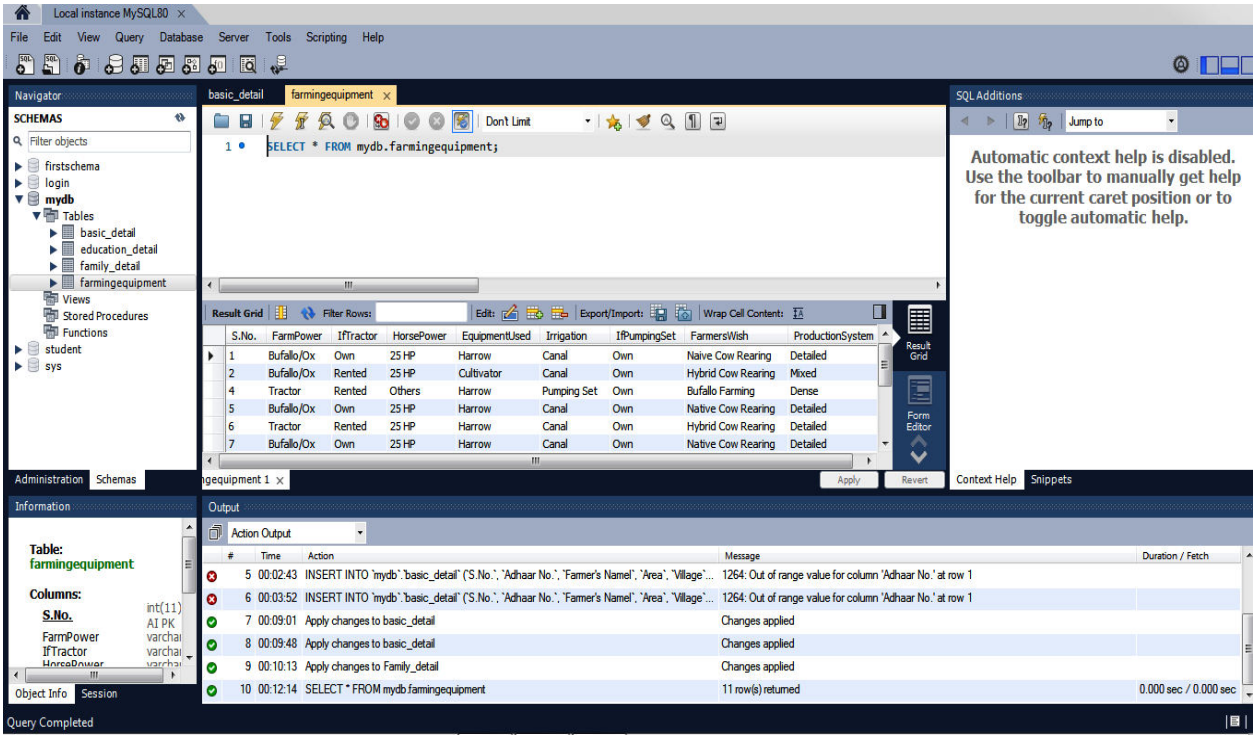

Figure 9: Table showing farming equipments details as saved.

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IV. CONCLUSION

This software design is able to cater to indigenous needs; as per requirement, the validated and normalized database can be maintained, and information can be generated on various aspects. The data can be imported on any statistical tool to compare/analyze on and for different parameters.

REFERENCES

[1] https://economictimes.indiatimes.com/news/economy/agriculture/economic-survey-milk-production-rises-by-five-percent-to-198-4-million-tonnes-in-2019-20/articleshow/80585416.cms. Accessed on 07-11-2021

[2] https://www.nddb.coop/information/stats/GDPcontrib. Accessed on 07-11-2021

[3] https://www.g2.com/categories/livestock-management(farmbrite). Accessed on 07-11-2021

[4] O.N.N. Fernando and G.N. Wikramanayake "Web based agriculture information system. Conference paper", 1998.

[5] Ravindra Kumar, Sushil Prasad and Pravin Kumar "Role of Information Technology in Livestock Development in India – An Overview". Society for Sci. Dev. in Agric. and Tech. Progressive Research 7 (Special) : 9-13(2012), 2012.

[6] Maciuc, Vasile & Creangă, Ştefil & Maciuc, Domnica & Vidu, Livia. "A New Software Programme for Data Management in Dairy Farms" Agriculture and Agricultural Science Procedia. 6. 226-231. 10.1016/j.aaspro.2015.08.063,2015.

[7] Possenti, L.; Savini, L.; Conte, A.; D'Alterio, N.; Danzetta, M.L.; Di Lorenzo, A.; Nardoia, M.; Migliaccio, P.; Tora, S.; Dalla Villa, PA "New Information System for the Management of Non-Epidemic Veterinary Emergencies" *Animals* , *10*, 983. https://doi.org/10.3390/ani10060983, 2020.

[8] https://www.report2020oie.fr/en/better-data-for-better-animal-health/

[9] Prasetya, R., & Gde Satia Utama, A. Accounting Information System for Cattle Feed Control to Achieve Feed Consumption Efficiency. KnE Social Sciences, 3(13), 1057–1072. https://doi.org/10.18502/kss.v3i13.4267, 2019.

[10] Z. Sánchez-Hernández, C.S. Galina-Hidalgo, B. Vargas-Leitón, J. Rojas-Campos, S. Estrada-König "Herd management information systems for population research". Agron. Mesoam. 31(1):141-156, enero-abril, 2020, ISSN 2215-3608 doi:10.15517/am.v31i1.37062,2020.

[11] Koszela, K.; Mueller, W.; Otrzą˛sek, J.; Łukomski, M.; Kujawa, S "Beacon in Information System as Way of Supporting Identification of Cattle Behavior" Appl. Sci. 2021, 11, 1062. https://doi.org/10.3390/app11031062, 2021.

[12] Ming-Chih Chen, Chien-Hsing Chen, and Chong-Yu Siang "Design of Information System for Milking Dairy Cattle and Detection of Mastitis". Mathematical Problems in Engineering. Volume 2014, Article ID 759019. http://dx.doi.org/10.1155/2014/759019, 2014.

[13] Anwar S. Ardjo, Prayitno, Liliek Triyono,Eko Sedyono "Developing Dairy Cattle Information System for Livestock Farms in Indonesia". International Conference of Applied Science on Engineering, Business, Linguistics ISSN: 2598-2532 and Information Technology (ICo-ASCNITech) Politeknik Negeri Padang and Politeknik Ibrahim Sultan, 13-15, 2017.

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