# USAGE STATISTICS ANALYSIS OF KNOWLEDGE DISSEMINATION AND DATABASE PORTAL BUFFALOPEDIA FOR BUFFALO FARMING EXTENSION PROGRAMS

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## ABSTRACT

Aimed at providing concise information on various aspects of buffalo statistics, breeds, health, reproduction, nutrition and management aspects, Buffalopedia (http://www.buffalopedia.cirb.res.in) portal allows stake holders in buffalo farming to use resources in integrated and interactive learning manner on internet. To assess patterns of usage and ease of accessibility, logger data of the portal was routed through Google Analytics, usage statistics and evaluation tool for websites. During period of six years (2012-18), a total of 3, 44, 425 sessions with 9, 18, 609 Page-views were observed. The present article demonstrates enthusiastic usage of the web portal across the globe with majority users in India (68.31%), followed by the USA (6.93%), Pakistan (4.26%), Philippines (2.99%) and UK (1. 03%). Large user response and reachability across the globe makes this portal a good platform for e-learning among buffalo dairy farmers.

**Keywords:** Buffalo husbandry, Buffalopedia usage, Web portal

Livestock is one of the fastest-growing sectors in agriculture with huge opportunities for rural livelihood upliftment across the world (FAO, 2014). Animal farming has now become knowledge-intensive due to challenges posed by increasing pressure of income generation with limited resources for profitability, livelihood earning and sustenance (Thornton, 2010). Dissemination of knowledge in animal farming gained through research and transfer of technologies to the end-users has still not been accomplished to the optimum levels (Tiwari *et al.*, 2010). Information and Communication Technology (ICT), popular as e-Learning, offer immense opportunities to strengthen agricultural extension system all over the world (Dahiya *et al.*, 2016).

Buffalo, a triple purpose animal producing milk, meat and draught power for farming, has a share of about 53% in milk production and 30% in total meat production of India (FICCI, 2013), with a huge potential for further growth. India has 108.7 M buffalo population (more than 57% of the World buffalo population) (19th livestock census; FAO Stat 2014). Despite these encouraging facts, production per buffalo in India is low. Buffalopedia portal provides quick and efficient knowledge dissemination to farmers and other stakeholders. The present study analyses its usage volume, ease of usage and utility to the stakeholders, for undertaking necessary refinements and additions/alterations to make it more user-friendly and useful.

## MATERIALS AND METHODS

**Development environment and database:** Template design for the Buffalopedia web-portal was prepared using the 'Joomla' content management software on a PHP

based platform with Microsoft Windows® series client operating system and 'MySQL' database. The Buffalopedia homepage is running on the URL: http://www.buffalopedia.cirb.res.in. (Fig. 1)

**Source of Information for database:** The information displayed on the Buffalopedia web-pages was gathered as e-lessons from ICAR scientists, published literature, research scholars, progressive farmers and other suitable experts.

**Categorization of Information:** All information has been categorised into three categories–All about Buffaloes, Buffalo e-library and Framers' Hindi corner. Home page allows registration of users. 'Ask the expert' is an interactive link for raising specific queries of farmers. Web- pages have dropouts which take the user further to other pages where the information on very specific topics is displayed.

**All about Buffaloes:** This section describes buffalo as a livestock species, its domestication, and distribution across the globe, special characters and utility in agricultural system. The drop out for this main webpage includes topics - Buffalo - as a species, History, Worldwide Distribution, Population, Classification & Breeds, Utility of Buffalo and Behaviour (Fig. 2. Screenshot of 'All about Buffaloes' on Buffalopedia)

**Buffalo e-library:** Different buffalo breeds and general topics covering health, production, reproduction, nutrition, housing and certain extension activities available through different Govt. agencies in India has been described in this section. This page has drop outs on – Breeds, Health, Reproduction, Nutrition, Meat Production, Buffalo housing, Managing Buffaloes during Drought and Scheme and Policies. (Fig. 3. Screenshot of 'Buffalo e-

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library' on Buffalopedia).

**Farmers' Hindi corner:** This section is aimed at making available relevant information to the farmers in Hindi. This web page can be used by the farmers to raise specific queries as well as give valuable feedback.

**Logger data analysis through Google Analytics:** The statistical data was obtained from the Google Analytics reports (Google analytics 2015). This internet tool produces reports on the use of websites and web portals, trailing unique users and the patterns of usage. The data is generated in real time for the parameters including users' behaviour, location etc. Technically, the information was gathered using JavaScript code.

## RESULTS AND DISCUSSION

Google Analytics is a valuable tool for determination of a website performance quickly and reliably (Jasra, 2006). The data generated gives ideas for facilitating interaction between users and website (Fang, 2007). It only requires opening an account with Google; installation is quick and easy (Google analytics, 2015).

The 'audience overview' data from the Google Analytics on Buffalopedia web portal suggest that in six years (May 12, 2012 to July 1, 2018) there were 3,44,425 sessions with 279424 users and 9,18,609 page reviews (Fig. 4). Further, analysis shows that 2.67 pages were viewed per session with average duration of 2 minutes 22 seconds with bounce rate and new sessions at 69.75% and 88.4%, respectively. Maximum viewership was from India (68.31%), while almost 33% was from other locations across the globe (Fig. 4; Table 1, I). This indicates the demand for knowledge acquisition on buffalo production systems is from across the world (Fig. 4 & 5).

The 'audience overview' data indicates that the portal is being used extensively. High bounce rate points out that the users are facing difficulties opening the web-pages which can be due to slow internet speed either at the user end or the host website, higher online traffic at the site, more text per page etc. (Patel, 2014). This web-portal is hosted at www.cirb.res.in., which is based on freely available 'Joomla' content management software on a PHP-based platform that is inherently slow and therefore upgraded commercially available platform can perform better (Kerr, 2013). The fact that more than 11.6 % are returning visitors is an indicator of the usefulness of the portal. Unfortunately, no such statistical analysis for any other website dedicated to agricultural extension has been reported for comparison.

**Table 1**

**Geographical location wise users of the Buffalopedia web-portal**

| Basis | Sessions | Users (%) |
|---|---|---|
| **I. Country Wise** | | |
| India | 224401 | 68.31 |
| United States | 26377 | 06.93 |
| Pakistan | 14062 | 04.26 |
| Philippines | 8921 | 02.99 |
| United Kingdom | 5968 | 01.30 |
| Kenya | 3760 | 01.30 |
| Canada | 3394 | 01.01 |
| Nepal | 3347 | 00.88 |
| Bangladesh | 3274 | 00.88 |
| **II. India- State Wise** | | |
| Delhi | 40277 | 17.95 |
| Maharashtra | 38760 | 17.27 |
| Karnataka | 17112 | 7.63 |
| Uttar Pradesh | 16026 | 7.14 |
| Telangana | 12604 | 5.62 |
| Gujarat | 11002 | 4.89 |
| Haryana | 10832 | 4.83 |
| Tamil Nadu | 10783 | 4.81 |
| Rajasthan | 7950 | 3.54 |
| **III. India-City wise** | | |
| New Delhi | 36155 | 10.50 |
| Pune | 16873 | 7.52 |
| Bengaluru | 15521 | 6.92 |
| Mumbai | 15132 | 6.74 |
| Chandigarh | 10460 | 4.66 |
| Chennai | 7910 | 4.34 |
| Ahmedabad | 7091 | 3.16 |
| Lucknow | 6966 | 3.10 |
| Jaipur | 6433 | 2.87 |
| Indore | 6023 | 2.68 |

The geographical location of Buffalopedia webportal users (Table 1, part II and III) is in accordance with the internet availability and usage in the country - southern and western states have better internet facilities and more internet users (The Indian Telecom Services Performance Indicators, 2014) (Fig. 6).

The Google Analytics report on 'Behaviour overview' of users reveal that among different sections visited, maximum interest has been shown by users in Murrah breed regarding its place amongst other breeds of the country, Origin & Breeding Tract, Physical
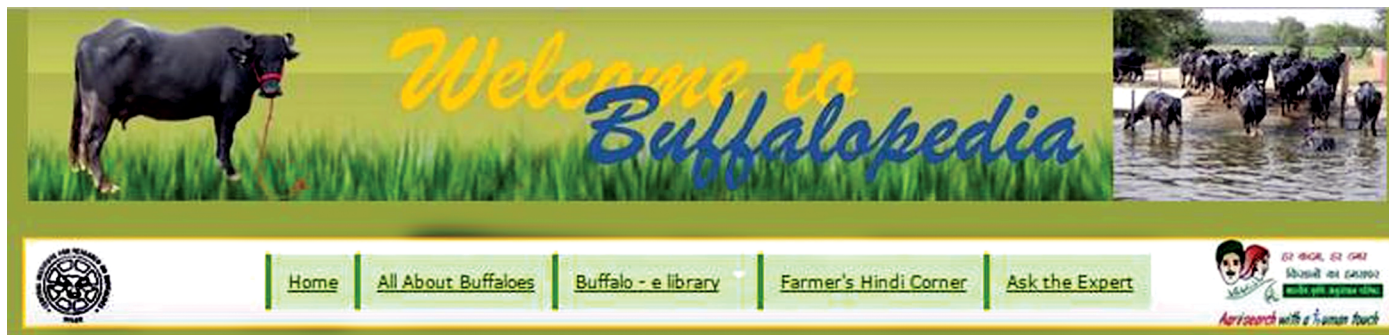
Fig. 1. Screenshot of the homepage of *Buffalopedia* web-portal



Fig. 2. Screenshot of 'All about Buffaloes' on *Buffalopedia*



Fig. 3. Screenshot of 'Buffalo e-library' on *Buffalopedia*
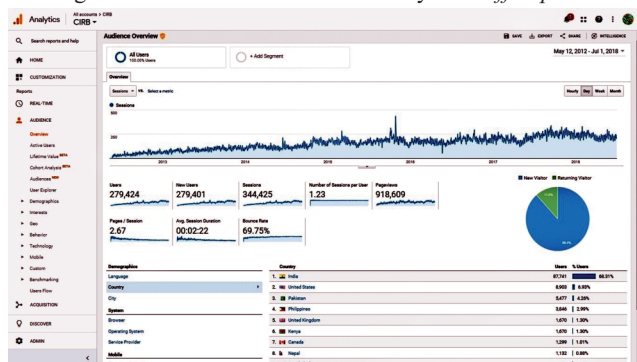


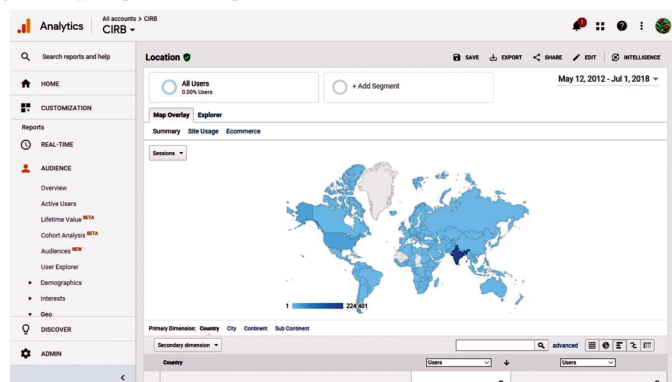Fig. 4. Screen shot of Google Analytics- 'Audience overview' report of *Buffalopedia* portal



Fig. 5. Screen shot of Google Analytics- 'Locations' report of *Buffalopedia* portal across Globe
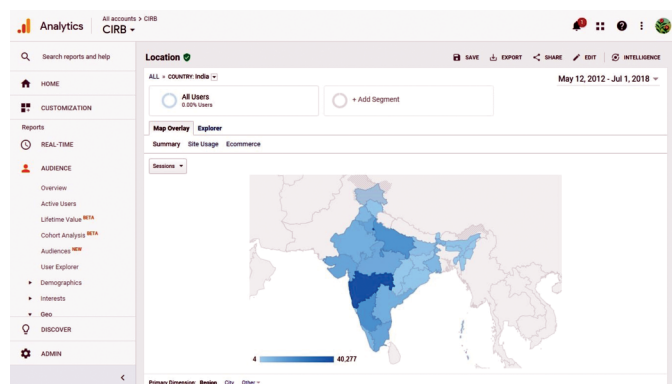


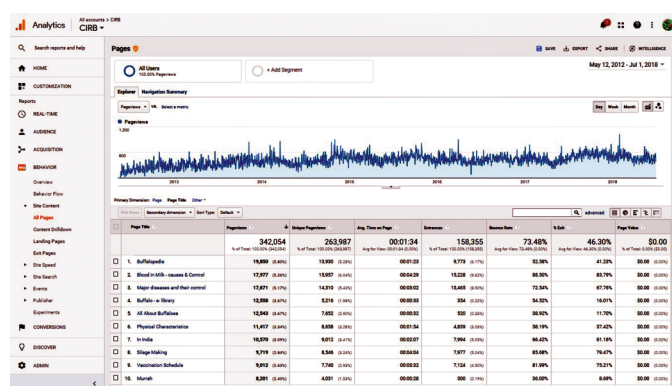Fig. 6. Screen shot of Google Analytics report on User 'Location' of the *Buffalopedia* across India



Fig. 7. Screen shot of Google Analytics report on 'User Behaviour overview' of *Buffalopedia*

Characteristics, Production Traits, Classification & Breeds, Population (Fig. 7). Other popular pages include Buffalopedia (home page), All About Buffaloes and Buffalo - e- library.

'Agropedia' developed by the Indian Institute of Technology, Kanpur (IIT-K) as SaaS – 'Software as a Service' model aimed at providing agriculture related information through ICT (Agropedia, 2008). Information needs of livestock farmers are quite different from those of the crop-based agriculture, which necessitates developing alternate web portals (Tiwari *et al.*, 2013). The Buffalopedia is aimed to fill-up this gap for dissemination of specific knowledge to buffalo farmers.

Joomla is an open source content management system (CMS) which is used for developing different applications on the web since 2005 (Rahmel, 2009). This freely available CMS offers good and extensible website functionalities for building corporate websites, corporate intranets and extranets, news publishing, e-commerce, and NGO web sites. Buffalopedia is one such application of the Joomla. Compared to 'Agropedia', this portal has simple architecture and therefore easy to maintain and update.

The Google Analytics statistics on the Buffalopedia web portal suggest it as a dynamic – change every time, quick – delivering information on weather, disease, natural calamities etc. related to buffalo farming and permits anytime retrieval of information on the subject area. The policy makers and developmental agencies on agriculture, rural development and poverty alleviation can design and use these types of web portal at very low cost and the present portal can set a precedence for this.

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