

Feature Article

Data Dissemination in Forestry Sector: Need, Constraints and Trends

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One of the main constraints involved with research and situation analysis in forestry sector is the lack of re-measured data over a long period of time. Since the forest dynamics and tree growth takes such a long time to provide valuable insight, the data gathered in a short time period is mostly not useful. Further long-term data measured at regular intervals to detect such changes is not feasible without an intervention of a dedicate institute or group of institutes so that they can implement a formal system to collect required data and disseminate in effective manner in a selected platform. Due to the rapid change of technology, data disseminated via printed form become less popular at present. Further, raw data cannot be provided in bulk via those methods. Therefore web-based data dissemination systems, especially web portals became very much popular among the present generations. In addition to the ease of data storage, there are many advantages of having portals such as data upload, data filtering etc. However, if the portals are poorly maintained or if those do not successfully cater the user requirements, the popularity will decline. This paper discusses about the different users of forestry sector data, characteristics of good data dissemination systems, problems faced by the users in data availability and different methods of data dissemination. In addition, advantages and disadvantages of web-based data dissemination systems, especially web portals are also discussed in detail.

Keywords: web portal, public access to data, stakeholder coordination, improved communication

1. Introduction

Data dissemination is simply defined as getting the right information to the right people at the right time so they can make right things (Brigman & Hanson, 2000). Such a system is necessary to produce and disseminate high-quality statistical data and information timely to meet the various and changing needs of different users.

Good data dissemination system in forestry sector should provide with an acceptable amount of data or information for varying purposes from basic understanding, policy making to high quality research. Data obtained from this type of entity can be used to addresses the full range of issues prevail in the forestry sector by compiling and disseminating data and making explicit plans for improvement of national procedures with best practices (GDDS, 2013).

Good data dissemination system is a structured process through which the related organisations commit to improve the quality of the data compiled and disseminated by their statistical systems over the long run to meet the user needs (KNBS Data Dissemination and Access Policy, 2012). The members that participate in the system determine themselves the priorities they will pursue in a set of statistical development plans that reflect the migration toward full realiaation of the objectives of the data dissemination system as well as recognition of the resource and other constraints that determine the pace of the migration (GDDS, 2013).

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Data or information related to the forestry sector available in different forms are useful for various purposes such as resource assessment (availability of wood and non-wood forest products, conservation values, social values etc.); resource monitoring (forest cover change, quality and existence of habitats, timber yield monitoring etc.); reporting (progress of project activities, status and severity of damages, expansion due to reforestation programmes etc.); planning (implementation of decisions taken on resource management such as harvesting, reforestation, afforestation etc.) and research (conducted by various institutes to find out new information etc.). In order for generating accurate outcomes, it is essential to maintain a proper data dissemination system minimising the bias while increasing the precision.

2. Variety of users of forestry data and access

Although the users of forestry related data vary in numerous way, they can generally be divided into two groups as non-commercial and commercial users. Individuals or groups of non-commercial entities such as universities, non-profitable non-governmental organisations and government institutes are grouped into the non-commercial category. They do not make profits by using the available data. However, users of the business sector such as forestry investment companies or regional plantation companies in Sri Lanka, multinational firms, businesses that have operations all over the world, value added geospatial technology companies etc. can be grouped into the commercial sector. The use of data by this group leads to income generating opportunism for them.

Both commercial and non-commercial users are re-divided into end-users and value added users. The outputs of the end-users cannot be further used as input data for further analysis and therefore they are considered as consumers of data. The outputs of the value added users, who are considered as data integrators or re-disseminators, can be used as input data for further activities or analysis (Global Spatial Data Workshop, 2004).

There is a serious concern among certain stakeholders on the matter of right to access data and dissemination of all forms of data collected in forestry sector. This concern is primarily based on three factors which was debated for many years, yet a conclusive agreement has not been reached. The first factor is that the forestry related institutes are public funded and therefore some experts argue that the interested public should bear the right to access data (KNBS Data Dissemination and Access Policy, 2012). Some argue against that view as if all available data are freely disseminated, those data can be unlawfully used against the same institutes or the government which may create unnecessary unpleasant situations. Certain countries such as United States of America accepts the right to access to forestry related data and therefore they have a good dissemination system. However, those data may not be provided in raw form and the user may have to make a payment to receive them. The last factor is that most of the forestry sector data are not ethically sensitive or confidential and therefore dissemination will not create issues. Further, provision of data increases the transparency of the particular institute so that there is a higher trust on them by the public.

3. Characteristics of good information

It is important to note that just storing a large amount of data in any form of platform does not efficiently support the users. Therefore the factors given below are considered essential for a good data dissemination system.

3.1 Coverage

If the data collection procedure effectively represent the entire geographic variation in any country covering all forest types, its value becomes very significant. Even for a smaller country like Sri Lanka, the differences of the forest types are high due to its climate and geographic variability. In addition Sri Lanka has a large amount of forest plantations established in all three climate zones, viz., dry, intermediate and wet, using different species such as teak, eucalyptus, mahogany etc. Therefore a good data dissemination system should cover all those variations to cater the requirements of the users.

3.2 Periodicity and Timeliness

Proper data dissemination system should recognise that the importance of production and dissemination increases with appropriate periodicity and timeliness (Dissemination Policy on Microdata, 2007). Periodicity refers to the frequency of compilation of the data (viz., the relevant period covered by a data observation, e.g., annual, quarterly, monthly, weekly, daily, etc.). The periodicity of a particular data category reflects several factors, including the ease of data collection and compilation, and the needs of analysis (GDDS, 2013).

3.3 Access by the public

Dissemination of official data is an essential feature to maintain the trust of the public because readiness and equal access are principal needs for them (GDDS, 2013). However, in reality, access rights given for different user groups identified by data dissemination systems could be different, but the possibility of finding or filtering the required information should be reasonably high (KNBS Data Dissemination and Access Policy, 2012). The advantage of having a web-based data dissemination system is that the access is easier than any other method. Further, there is an opportunity for selecting the right users by the agency which disseminates the data by registering them which will hinder the access of unwanted users. Some data can be disseminated under payment procedures, e.g., digital maps of different scales etc. in the same system via a payment gateway.

3.4 Integrity

Data integrity refers to the validity of data, but it can also be defined as the accuracy and consistency of stored data. It relates to the validity of data for the period of time during which it is relevant from that source. When data is described as having integrity, it is viewed as being genuine and resilient during a period of time and hence reliable for future use. In order to maintain the integrity, it requires assurances that there are mechanisms in place to prevent accidental and/or intentional unauthorised modification of the data (<http://www.blazent.com/difference-data-quality-data-integrity/>).

3.5 Quality

When the term quality is used in reference to data, it conveys a clear statement to the individual consuming it. This largely reflects the context in which it will be used, and therefore its intention and meaning must be clear. Different terms such as complete, relevant and consistent are also used to describe data quality. The result of poor data quality, e.g. wrong and inconsistent data, is poor investments and excessively expensive operations. (<http://www.blazent.com/difference-data-quality-data-integrity/>). Data quality must further given a high priority and thereby the users should be provided with information to assess quality and quality improvements.

4. Problems faced by the users in data availability

Different users of forestry related data expect different data types varying from just averaged values to detailed tree-wise data. Therefore with all the efforts made by the data dissemination organisations, problems described below can still be arisen with the available data and information.

4.1 Non-existence of required data/information

Certain cases, the data required by the users may not be available in the dissemination system. Therefore the requirements of such users may not be fulfilled. Even if such data are available, they could be outdated due to lack of regular updates.

4.2 Accuracy, inconsistency and inadequacy

Available data in the system may not be accurately collected by maintaining required precision. Sampling accuracy could also be poor due to improper coverage of the entire geographical variation.

They could also be low value because the number of individuals, for example, trees, measured are not sufficient to represent the respective population.

4.3 Use of outdated methods for data collection

Forestry data are sometimes collected using outdated methods causing low accuracy or providing less information (Global Spatial Data Workshop, 2004). This is much related to remote sensing where different countries use satellite images of different resolutions for forest cover analysis. For example, LANDSAT™ images provide 30 m spatial resolution while SPOT images provide 6 m. Although forest fragmentation is prominent in tropical countries at present, accurate details may not be available with the data generated using low resolution images such as LANDSAT™.

4.4 Non-availability of data collected at regular intervals

Other than spatial resolution, temporal resolution of data collection is important to detect the changes of forest cover and ecological succession. Therefore the re-measured data should be adequate enough to detect such changes of the resource of interest. The measurement intervals should not be too long so that the important changes will be detected during the analysis.

4.5 Lack of coordination between different stakeholder agencies/institutes

This becomes a serious problem when the ownership of particular resource is shared by different organisations where the information is gathered and disseminated by all of them. Discrepancies between those agencies will arise on the matter of collection of data and their quality minimising the status of the service expected by the users.

4.6 Selection of the users

In order to minimise the unnecessary data sharing issues, data dissemination organisations need to identify proper users. Type of data distributed can also be changed depending on this matter. For example, raw data can be given to the researchers working in the universities and research institutes while summaries of those data can be given to the other types of users.

4.7 Prior publications using collected data

There could be instances that the users who obtain data from available dissemination systems publish the findings without acknowledging the relevant organisation which provided data. This kind of actions create complexities between two parties because the data dissemination agency loses the ownership of the data and the credibility of the hard work implemented in data collection.

4.8 Confidentiality

In a few cases, forestry related data come from very sensitive sources which will reveal the information of the persons involved with forest offences. Although legally those should be revealed to the police, it is unethical to highlight their identities in research. Therefore confidentiality must be strictly maintained by the users or else such data can be kept within the collection organisation without storing in the dissemination platform.

5. Methodology of making data available

Figure 1 illustrates the simplified process of dissemination of data after the collection. The collected data, should, however, be certified by the organisation itself or by an authorised person to increase the quality, integrity and credibility (KNBS Data Dissemination and Access Policy, 2012). Only such data should be made available in a suitable archive so that the users can access via appropriate methods defined by those data dissemination organisations.

Forestry related data can be made available either separately by each relevant organisation or many organisations working as a single team on a single platform (Figure 2). If each organisation separately disseminates the data, e.g., Department of Forest Conservation, Sri Lanka, such organisation

should maintain its own data dissemination system which could be similar to that of other organisations or unique to the particular organisation. On the other hand, if many organisations such as Department of Forest Conservation, State Timber Corporation, and Department of Wildlife Conservation work together for data dissemination, it has to be done via a separate team which is responsible for the quality and integrity of data.

Although the second method is less costly, issues could rise due to the mismatch of interests, data collection procedures, accuracy levels and data collection intervals. Therefore those who are responsible for data management archive have to work in very carefully to minimise those issues while maintaining the quality of data.

Data can easily be disseminated by above mentioned systems using web-based methods. The basic strategy is to disseminate information simultaneously through various media. An increasing emphasis being put on electronic dissemination, may also be supported by multi-languages (KNBS Data Dissemination and Access Policy, 2012). Publications and data may be freely downloaded or ordered directly on the server.

Data shops is another dedicated way of disseminating data in both print and electronic forms. In close collaboration with the national statistical institutes, data shops sell publications and data to their users, while providing a wide range of tailor-made services, up-to-date products, information searches, data calculation on request etc.

Databases also provide data for the specific users on their requirements. This could be the widely available type at present as web based databases can be easily formed and such systems are mostly free of charge.

Publications, another common way of distributing data and related information, are disseminated through the networks of the publication institutes. Although raw data in large quantities may not be disseminated through publications, the summaries and the availability of detailed data are included.

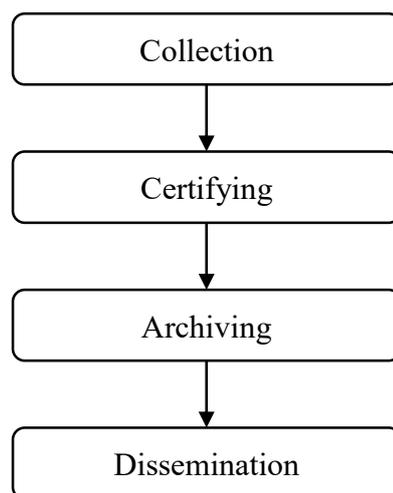


Figure 1: Simplified diagram of data dissemination.

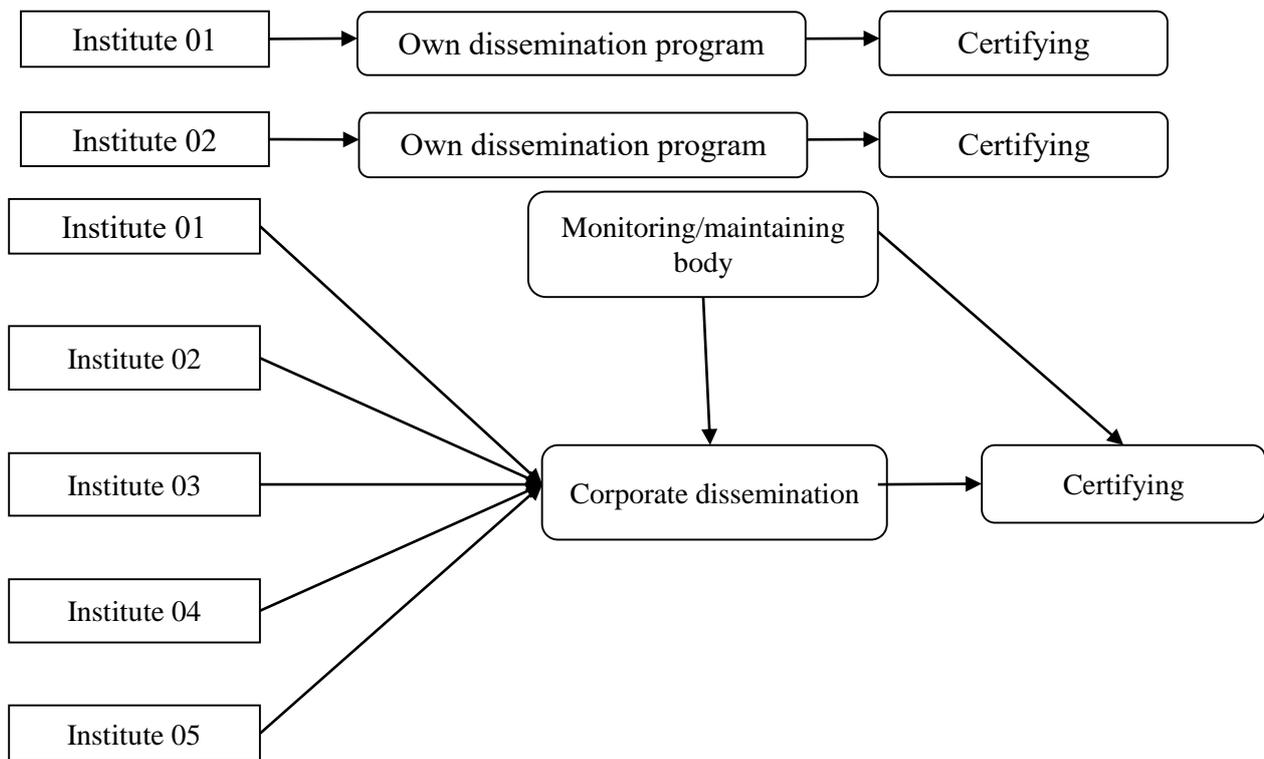


Figure 2: Data sharing by different organisations separately (above) and many organisations on a single platform (below).

6. Use of web portal for data dissemination

With the increase of technology and the use of computers, laptops and smartphones, electronic-based data disseminations become highly popular during the recent past. Among such methods, dedicated web portals are considered to be important than the rest (Tella et al., 2012). Web portal is a specially designed website that brings information from diverse sources, like emails, online forums and search engines, together in a uniform way. Usually, each information source gets its dedicated area on the page for displaying information; often, the user can configure which ones to display (Dias, 2001). Variants of portals include mashups (which uses contents from more than one source) and intranet "dashboards" for executives and managers.

6.1 Advantages of a portal in data dissemination

Numerous advantages of using a portal for data dissemination are seen at present as described in the following sections. Due to those reasons, use of portals for data storage and dissemination has become very popular among the forestry sector organisations and users.

Improved communication

Data can be uploaded through web portals and discussion forums can be established among different user groups. Some forestry projects are conducted by a number of experts working in different countries. In such circumstances, data sharing, upload of results and discuss the findings are much easier with a dedicated archive maintained in internet (Guzmain, 2005; Tella et al., 2012). It will also help to maintain the information up-to-date.

Streamlined processes of access

Lengthy processes such as exchanging emails etc. which are required for obtaining approval to use data can be minimised via a portal. However, there should be a need of a registration process with proven identities, but still it will save much time of the users.

Data management

Newly collected data can be easily uploaded to the portals rather than dissemination via other forms such as annual reports. Therefore there is a significant reduction of print and distribution costs. User guidelines can also be easily maintained which helps to increase the knowledge in working with stored data.

Cross-platform usage

Data portals can be easily accessed from different operating systems and browsers which are used by different users (Ofoegbu et al, 2014; Popovic et al., 2009).

Gradual growth

Portal can be set up at smaller scale at the beginning to cater the available data dissemination at that time. It will later be grown with the time to be compatible with increase data uploads and number of users.

6.2 Issues in web portal development

According to the information of the Portal, Content and Collaboration Summit (2012), 10% to 15% of portal initiatives are scrapped altogether due to many reasons (<http://www.prescientdigital.com/articles/intranet-articles/five-common-portal-problems-and-their-solutions>) as shown in the following section.

Ignorance of the user requirements by developers

End-users may not see a significant value in a portal if it does not directly help them to find the required information. Many organisations fail to effectively communicate the benefits of the newly created portals. In such circumstances, it is important to make sure to know the capabilities and qualities that will make the work-lives of the users easier.

Change of work by the new generation of employees

Effective knowledge transference has become very much important in the modern world than in the past. The present generations tend to work at their living places rather than dedicated offices and therefore the portals should be compatible not only with different web browsers, but also with different devices such as laptops, tables, mobile phones etc. (Global Spatial Data Workshop, 2004).

Underestimation of the cost and complexity of portal redevelopment projects

This can be a source of confusion when trying to narrow down the scope of a portal development project which leads to increased cost/complexity while it grows. In such circumstances, it is inevitable to collapse the whole system losing a platform to disseminate important data in the forestry sector.

Lack of fresh and relevant content

Creating contents for users should be viewed as a lifecycle and not as one-time event. Therefore the information update should be made at reasonable intervals to keep the faith of the users which leads to enhance the popularity of the data portal.

Lack of a governance model for portals

Assigning ownership can be one of the most important but challenging tasks during portal development projects, especially when multiple organisations are working together (Global Spatial Data Workshop, 2004). This will create conflicts of interests on different data types, causing ultimate destruction of the entire data dissemination system.

7. Discussion

Data dissemination should be considered as one of the key objectives of forestry sector. As in present-day society, access to relevant information is considered to be a strategic privilege, by means of mass media the potential discrimination between the public authorities, the legal civil associations, the business and public sectors is eliminated (Dissemination Policy on Microdata, 2007). It is believed that everyone who is interested has the same opportunity to reach the basic statistical data and to be informed under equal conditions.

Openness of statistics can be easily realised by means of mass media where the scope of presented data is beyond limitation (Ofoegbu et al, 2014). Dissemination can be considered like a dandelion whose seed-head is scattered by the wind until it falls on the fertile soil.

Confusion is one of the major problem with the use of available data as the user may not be able to decide which dataset to be used. This becomes serious once the same information is provided with different projection systems (KNBS Data Dissemination and Access Policy, 2012). Further data on the same natural resource could be disseminated by different agencies in different manner confusing the users. In addition, the slow updates of the data become useless as the importance of such data will be lower with the time.

One of the major problem for the users in data access is the need of following lengthy procedures to obtain the permission. There are simple to complex data sharing agreements available in different institutes, even in Sri Lanka. The process becomes much lengthy if the permission process requires certified letters and multi-scale approvals.

Some countries, there are national policies which restrict the data access for most of the society and therefore there is no opportunity for obtaining detailed information. Further, if the dissemination agency poorly manages the data and dissemination, slow in update assembly and assimilation, the interest of the user will decline. This will further creates issues if there is a weak mechanism for data and information sharing, including collaborative analysis.

Official statistics must have the confidence of their users to fulfil the purpose of providing the public with information. In turn, confidence in the statistics ultimately becomes a matter of confidence in the objectivity and professionalism of the agency producing the statistics. Transparency of its practices and procedures is a key factor in creating this confidence (GDDS 2013).

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