

Impact Of Biodiversity Database Networks On Biodiversity Science: A Global Concern

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ABSTRACT

Online biodiversity information databases are the requirement of general bioinformatics systems due to the rapid changes in the technologies and Internet. Biodiversity surveys and genetic searches are very expensive and time consuming process as the scientists and researchers are busy in collecting and maintaining data; as a result of it, there is less time spends on research. The biodiversity data has been found in government institutes, laboratories and natural environmental museums. Moreover, these database systems are not well-matched with contemporary data types. The biodiversity information databases have proved so much helpful that it increases the knowledge, discoveries and conservations. Such new inventions and discoveries are in the priority list of patent led by WTO regime. Therefore, it is essential to have global database and a global web portal to collect and maintain the scattered information resources.

Keywords: Biodiversity, Bio-informatics, Database information, Database sources, Global bioinformatics System, Sustainable development

1. INTRODUCTION

In the era of progress there is a question which is often put to a man that why should we care for biodiversity? The answer of this question lies if we need to breathe, drink and eat; equally preservation and protection of Biodiversity is fundamentally important. The next question is what is the exact meaning of biodiversity and what it includes? Biodiversity by and large is sum up of approximately 9 million unique and rare living organisms (including Homo sapiens) that inhabit the earth and their interactions amongst them. Generally, biodiversity includes every species of bacteria, virus, plant, fungi, and animal, as well ¹as the diverse genetic material found within each species. Therefore, biodiversity is the body of different ecosystems, the species and their on-going evolutionary processes which helps them in their functioning and adapting [1].

Biodiversity conservation is at alarming rate. The physical and the mental health of human being are also dependent upon nature. The value of biodiversity reminds that, natural world is [quintessential](#) part of human living. In the recent years; there is a tremendous spread of biodiversity informatics over the World Wide Web (WWW).

These databases are helpful in the locating and determining the nature of biodiversity. The biologists and computer scientists collectively worked to organise the scattered data. By virtue of their efforts, the remarkable expansion in biodiversity informatics shifts biodiversity information system into a gigantic global biodiversity information system. Hence, internet has played a vital role to meet the challenges of biodiversity science and provides the opportunities to take biodiversity information system at global level. The scientists and researchers are working

globally and mutually on several parameters like biomass, ecosystems, phyla, floras and faunas, hot-spots, genetic erosion, the impact of aliens so on and so forth. The biodiversity informatics is working on the project to develop the local data interoperability and knowledge synthesis into the global biodiversity data compilation and the amalgamation of disseminated data advance research [2].The system of biodiversity informatics is to access the data and make it approachable to the researcher as shown in Figure no. 1.

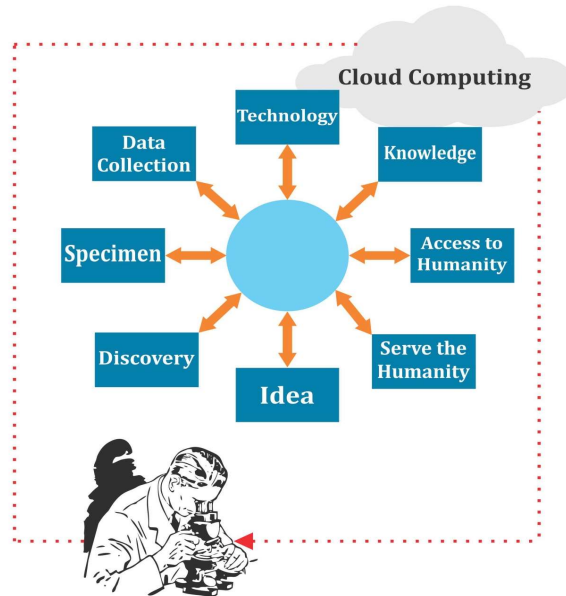


Fig 1: Biodiversity web portal process

Biodiversity conservation is indispensable to fulfil the fundamental human requirements of drinking safe and pure water, safeguards from floods, storms and global warming. The benefits derived from organisms, ecosystems and ecological processes known as ecosystem services. In totality, biodiversity keeps us alive and active. The benefits derived from organisms, ecosystems and ecological processes known as ecosystem services.

The nature provides livelihood to the mankind, connects them with spirituality by placing cultural values in them like kangaroo and emu on the Australian coat of arms. Nature ensures these gifts in the form of biodiversity without any cost. The loss of biodiversity is dangerous and its consequences are beyond human control. India is a rich biodiversity country, the second most densely populous country among the world, is the 11th mega biodiversity centre of the world, having only two biodiversity hotspots out of 34 global biodiversity hotspots. The protection, preservation, conservation and procreation of nature are paramount consideration in the era of global warming. The rapid globalisation has significant impact on human society's weather good or bad? [3]

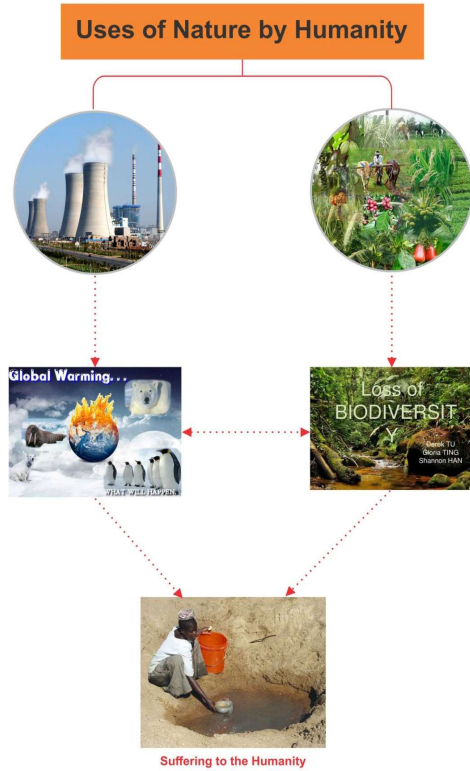


Fig 2: Impact of rapid globalisation on human society

The change and changes occurred in climate and biological diversity during the time makes the global warming the utmost bothersome issue of environment. The figure no. 3 presents a glimpse of countries for the existence of biodiversity informatics.

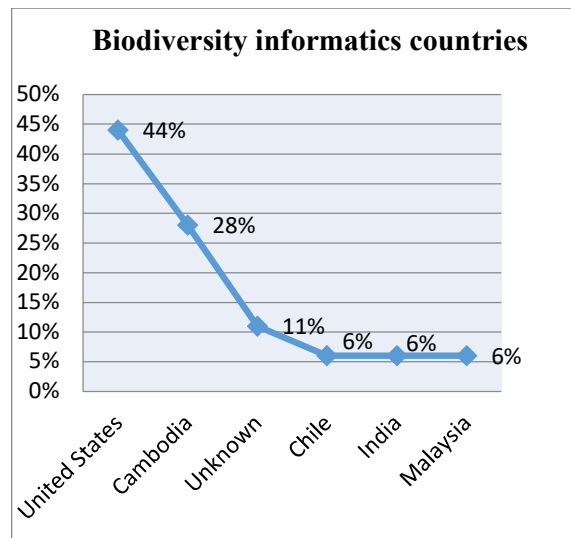
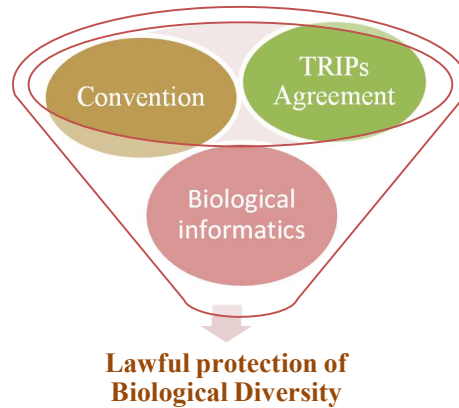


Fig 3: Information Systems Journal Statistics, 2017

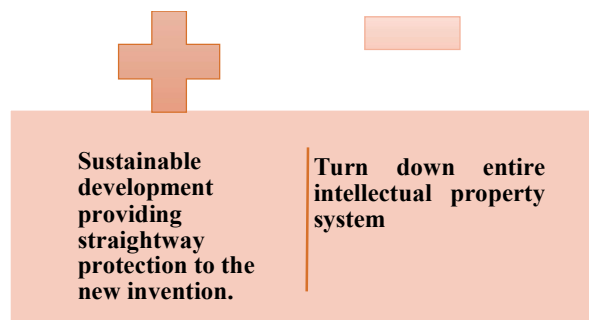
These statistics presents the status of different economics of the world to understand the origin of bioinformatics; also shows the present status of India’s bioinformatics system. On this basis India needs to take an immediate action to plan new policies for biodiversity related database [4].The legal framework for the biodiversity is three folds-

2. LEGAL FRAMEWORK FOR THE PROTECTION OF BIODIVERSITY



2.1. Convention on Biological Diversity (CBD)

Convention on Biological Diversity (CBD) and intellectual property rights (IPRs) are always a matter of discussion along with their side effects. Generally, the TRIPs agreement is having great impact in the fulfilment of CBD's objectives and on sustainable development but particularly, TRIPs agreement works as a consular to settle down IPR regimes into different nations of world to protect and preserve innovative knowledge and idea. Earlier, there is no provision for the protection of home grown or domestic knowledge and the TRIPs agreement provides straight way protection to the new invention. As per the agreement, there is no need to bite the profits of the actual owner. Undoubtedly, the agreement allows to get benefited through this knowledge by safeguarding information through patent process [5].



TRIPs Agreement on Biological Diversity

Fig 5: The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) 1995

On the contrary, the implication of TRIPs agreement is not good regulation in comparison with the objectives of Convention on Biological Diversity. There is no imminent necessity to turn down the entire intellectual property regimes of different countries to preserve, protect and sustainable use of the benefit-sharing measures with local communities as well (figure no.7).

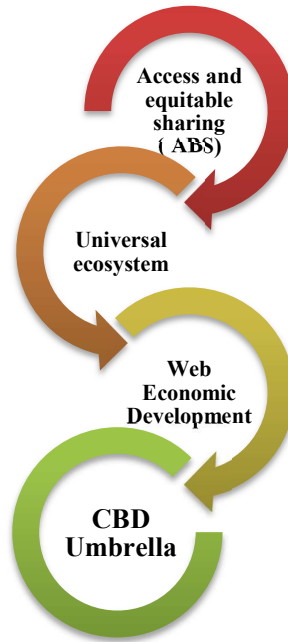


Fig 7: Convention on Biological Diversity (CBD)

The International Convention on Biological Diversity (CBD) is a worldwide agenda. It was embraced amid of Earth Summits also known as Rio de Janeiro Earth Summit, 1992. This is the best encyclopaedia document pertaining of all biodiversity issues comes under the CBD umbrella. India being a member country of CBD is under obligation to maintain the universal ecosystem for the web economic development; committed to follow ultimate goals of conservation, sustainable development of biodiversity, access and equitable sharing (ABS) directly comes from genetic resources. [6]

In the recent time, India made a convincing contribution by signing Nagoya (Japan) Protocol of 2010 which came into existence in 2014 on access and equitable sharing (ABS) of benefits arising from the utilization of genetic resources headed by CBD. In the year 2014, India presented 5th national report to CBD for the advancement of biodiversity database, also recent trends for obtaining data on new development and progress towards the bio informatics and new updates of genetic information. The sixth national report related to CBD is due by 31 March 2019 which will be the final review for the implementation of Biodiversity targets for the year 2011-2020 exclusively for Aichi Biodiversity targets. The proposed agenda of this report is national Biodiversity related data collection, compilation, information related strategies and plan of action of informatics. It also includes new or recent data, changes in the status and trends in data. The focal character of the body of report makes an appeal to the local population, communities, commercial hubs, civil society group, government and non-government body or organisations for the successful implementation of national biodiversity strategies [7].

1.1. Biodiversity informatics on Research

Biological databases put heart and soul into the bioinformatics. The scientists access a vast variation of biologically relevant data, along with the DNA sequence of organisms (Genomics) and genetic sequences of ingress organisms. Imbalance between new collected data and historically accumulated data.

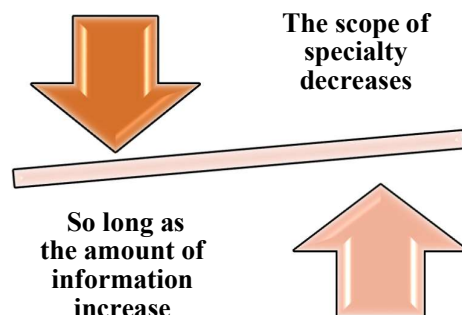


Fig 6: Balance is not maintained due to unlikeness of newly collected satellite data and historically accumulated data

Even though the world is literally at fingertips, technology inspired life style; technology learning environment and technology workplace in the present century. The combination of mind and technology (technology-installed discoveries, Internet search type, and virtual manipulative and multimedia resources) allow researchers to find out unanswered queries. All aspects weather it is conservation, sustainable development complex genetic system to the reformations in ecosystems wholly or partially biodiversity informatics gained importance to understand and compare the past, present and future expected aspects of eco system environment. The problematic area for biodiversity informatics is the lack of such mechanism to make a data available into such background of natural environment as well as environmental modelling. There is no online software generated that can cover the heterogeneity, mixture, collection, disparities and multiplicity on earth from the last universal common ancestor to the most recent population of organisms present on earth[8].

2.3.1. The biological data compilation is a complex, tiring and long term at macro level. The compilation process is so complicated due to the inter dependant process system and access of data range of informatics. To know the impact of informatics all the aspects related to biodiversity system has to be taken into account [9].

2.3.2. The biodiversity processes are complicated and having a large scale impact on environment. As much as the number of publications is increased the efficacy of specialized research is declining. The information collected from different search engines provides puzzled figures. To collect biodiversity related data it takes at least ten years to collect and covert that data into a standard electronic format.

2.3.3. The mushroom like growth of biodiversity related data on the different search engines of internet has been proved amazing but disorganised as well. The different approaches of scientists and computer scientists have created the data related information more complex [10].

CONCLUSION

The biodiversity environment is the full variety of species, genes and the ecosystems. Recent improvements noticed in bioinformatics is the output of coordination of advance technology information system with scientific experiments in the field of biodiversity; proved as a blessing to solve the inner complexities at both micro and macro levels. Biological databases are the fulcrum of bioinformatics. Scientists get the opportunity to compare the data to solve the complexities of wide range organisms. The ancient biological information is contained in outdated format of printed publications, such as newspapers, magazines and journals etc. comparatively to the contemporary data based systems is more focused on intellectual knowledge which is the outcome of decades, centuries and millennium research and socially sustainable investment. The present research based technology whether it is nationally or internationally; globally or locally is just a finger away from keyboard. This information is valuable for scientists, researchers; policy makers, students even used in commercial sector. If bioinformatics clubbed with modern software techniques will be worth appreciating in biodiversity researches. But there are numerous gaps in queue to be filled such as improper data management system, lack of advance software developers, poor network connectivity etc. Modern data are collected through imaging satellites used by governments and business hubs all around the world for example Google and Apple maps etc. It is a significant and modish step to analyse the biological world first; if modern bioinformatics technology blend with ancient information data; then only bioinformatics will revolutionise the entire bio system. Such kind invention, discoveries and knowledge will be guarded by patents and WTO-TRIPS agreement.

The biggest failure of bioinformatics is the data related to biodiversity spread out in museums, newspaper and different media sources that cannot be accessed; there is abundant information in the global biodiversity environment that also has not digitized yet. To utilise the biodiversity related data a researcher has to individually approach to that specified area which makes the research tough as nails. It is constant demand that bioinformatics must avail the required data whenever it is called by scientists, researchers and policy makers anywhere in the world; the dilemma is that information system is not so close at hand, it is nothing applied in policies nowhere it is convenient to the scientists and researchers. It is worth to say that the success of biodiversity conservation is solely depends on bioinformatics mechanism.

Biodiversity is spread everywhere but what about bioinformatics expansion, it appears that bioinformatics is more developed countries oriented. The biodiversity informatics enterprises must work in this direction to make it a global bioinformatics.

REFERENCES

[1]Bas, B. (2012). Explainer: what is biodiversity and why does it matter? <http://theconversation.com/explainer-what-is-biodiversity-and-why-does-it-matter-9798>.

[2] Udoh, S. O. (2015). Human Activities, Biodiversity Maintenance and Sustainable Development in Ikpe Community of Akwa Ibom State, Nigeria, *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)* Volume 20, Issue 9, Ver. IV (Sep. 2015), PP 55-61. www.iosrjournals.org.

[3] Roy, P.S, Kushwaha, S.P.S, Murthy, *et.al*, (2012) Biodiversity characterisation at landscape level: National Assessment, Indian Institute of Remote Sensing Deharadun, India pp.140

[4] Piramanayagam, S. (2007). An overview on biodiversity information in databases. vol.1(9), pp.367–369.

[4] Lamp, J. (2017). Biodiversity informatics, 2017, Countries. *Information Systems Journal Statistics. (ISJS)*. . <http://lamp.infosys.deakin.edu.au/journals/index.php?page=popstats&journal=495>.

[5] Monagle, C. & Gonzales, A. T. (2001) “Biodiversity & Intellectual Property Rights: Reviewing Intellectual Property Rights in Light of the Objectives of the Convention on Biological Diversity”. Center for International Environmental Law (CIEL), WWF International, Joint Discussion Paper March, 2001. www.ciel.org/Publications/tripsmay01.PDF

[6] Article 27.1. Of the TRIPs, these requirements establish the terms under which Members must offer patent protection. Members are free to offer even broader patent protection if they wish, so long as it does not contravene any other TRIPs provisions.

[7] Convention on Biological Diversity (CBD) in 1992

Article 8 (j) of the CBD

a. Respect, preservation and maintenance of knowledge, innovation and practices of indigenous and local communities) and the need for protection of intellectual property as a mechanism to reduce distortions and impediments to intellectual trade (preamble of the TRIPs Agreement.

b. Article 15 of the CBD (access to genetic resources and benefit sharing and Article 27 ad 28 of the TRIPs Agreement.

c. Article 16 of the CBD (access to and transfer of technology) and Article 7, 8, 27, 28, 31 and 39 of the TRIPs Agreement.

d. Article 18 of the CBD (technical and scientific cooperation) and the same provisions in the TRIPs Agreement.

Article 22(1) of the CBD provides “The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity”.

[8] The Biological Diversity Act, 2002 to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters related to it.

[9] Baxevanis, AD. (2009). The importance of biological databases in biological discovery, 2009; Chapter 1: Unit 1.1. <https://www.ncbi.nlm.nih.gov/pubmed/19728285>.

[10] [Lim J](#), [Bhak J](#), [Oh HM](#), [Kim CB](#), [Park YH](#) & [Paek WK](#). (2008). An integrated Korean biodiversity and genetic information retrieval system. [BMC Bioinformatics](#). Dec 12; 9 Suppl 12:S24. doi: 10.1186/1471-2105-9-S12-S24.