

EVALUATING SCIENTIFIC CONTRIBUTION OF THE SRI LANKAN SCIENTISTS IN THE FIELD OF ENVIRONMENTAL SCIENCE BASED ON THE SCIENCE CITATION INDEX EXPANDED (SCIE)

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Introduction

Global attention has been focused on environmental management since the 1970's, with the objective to ensure protection of the world from pollution and degradation (Basso & Bazzaz, 1998). Environmental issues have captured the attention of global organizations such as UNEP (United Nations Environment Programme), WHO (World Health Organization) etc. Environmental scientists play a key role in society's responses to environmental problems, and many of the studies they perform are intended ultimately to affect policy (Joel, 2003).

Scientific research is an essential component in guiding improvements in environmental issues and development of new initiatives. It is important to identify solutions to the challenges faced by the Sri Lankan environmental system, in order to refine and tailor local environmental practices to suit national requirements. Therefore, frequent evaluation of the scientific contribution of the Sri Lankan scientists in the field of environmental science is necessary to identify deficiencies and plan improvements.

Scientometric profile is an indicator of the scientific activity of a country. It reflects the strengths and weaknesses of research and development in a field (Arunachalam & Subbiah, 2000). Scientific products of each country which are indexed in international indexes indicate scientific activities of that country at international level. Therefore, it has always been crucial for the research administrators to consider these conditions in order to evaluate their scientific activities (Jeevan, 2002).

Methodology

The scope and coverage of this research are as follows:

- **Source:** *ISI SCIE* produced by *Thomson Reuters* for information in the Environmental science
- **Period:** The study period includes twelve years, i.e., 2000- 2011.
- **Geographical Area/:** Only Sri Lanka.
- **Publication Form:** journal articles, conference proceedings and abstract etc.

Based on the scope and coverage stated above, this study has adopted the following steps in conducting this research. The series of steps of this research process is as explained below:

STEP - 1 The *SCI* electronic database was used to compile papers published by Sri Lankan scientists in the field of environmental science for the period, 2000 – 2011. The citation counts are totaled from *Science Citation Index Expanded (SCIE)*. The use of advanced search (Boolean search strategy) in which used the 'field tag for address' search for Sri Lanka - Sri Lanka or Ceylon because until 1972 the country was officially known as Ceylon few of the articles

published the name Ceylon in the Addressalso search was carried out for subject in which used the 'field tag for subject' search for environmental science or environmental studies or ecology.

STEP – 2. Then by Using refine search, document type , subject sub fields , institutions, international collaboration , source title and scientists were found for analysis.

STEP – 3Based on the final analysis from the *SCIE* data, research profile on environmental science by Sri Lanka was mapped.

STEP – 4 The results of the above said analysis, Steps 1-3, are presented in detail with inferences and interpretations in the following.

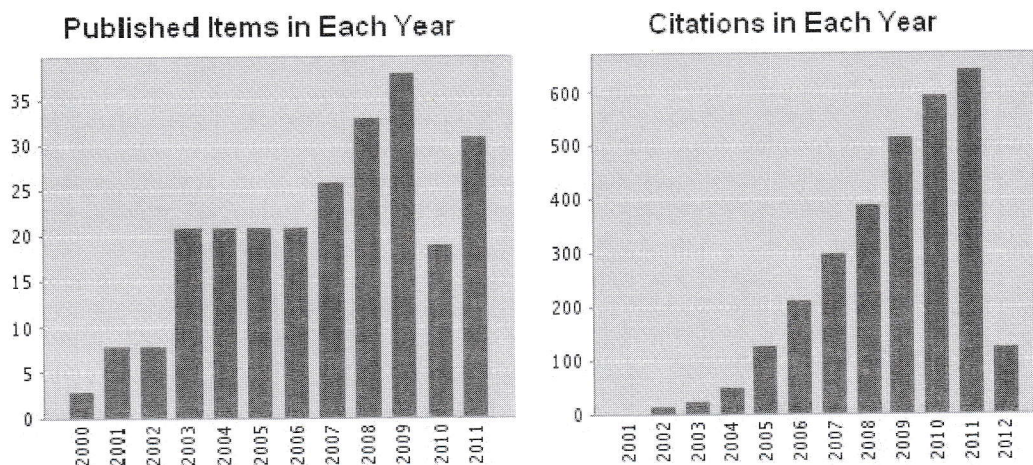


Figure 1: Scientific contribution on environmental science & citation count

Discussion and Conclusion

- The total scientific contribution of Sri Lanka is 4,360 records for twelve years (2000-2011) but the contribution of Sri Lankan scientist in the field of environmental science is 250 only. This includes all types of documents such as journal articles, conference proceedings, abstract etc.
- Amongst the varied forms of literature, journals are the major carrier of research communications.
- The highest number of publications (38) was produced in 2009.
- The average number of publications per year was 12 for environmental sciences
- The citation count has risen from 2 in 2000 to 650 in 2011, illustrates that the research work of Sri Lanka has received sustain attention.
- Out of the 250 publications contributed by Sri Lankan scientists, 233 (93.2%) are articles and 14 (5.6%) are conference proceedings.
- All Sri Lankan scientists' publications are distributed across 23 sub categories in *SCIE*.
- Sri Lankan scientists have published 250 research papers during 2000-2011. These papers appeared in 98 sources that originated from different parts of the world.
- The article "A high- resolution data set of surface climate over global land areas" was published in *Climate Research* in 2002. It has been cited 502 times, and ranks No.1 in terms of citations.

- The Sri Lankan publications have been produced in collaboration with 54 countries in the world. U.S.A is the country which has the most predominant collaboration to share with Sri Lanka with a count of 34 (13.6%), followed by England, Australia, Japan, and Germany.
- Contributions to articles are from 322 institutions which include Universities, Research Institutions, Hospital, Local NGOs and INGOs. Among the institutions, International water management institute (IWMI) topped the output with 74 (29.6%) records in environmental sciences.
- The Journal “*Chemosphere*”, ranked 1st in terms of their frequency of occurrence.

The evaluation of scientific contribution of Sri Lankan scientists in the field of environmental science since 2000-2011 has thrown some light on how the research has evolved. This study intends to highlight and acknowledge the history of research output in environmental science by the Sri Lankan scientist. It includes quantum of literature, Citation, subject areas, institution, collaboration, Sources (Journal), highly cited articles etc.

The study will provide research policymakers with a more complete picture of innovation capability in the research field, and help them to make better decisions. In addition, it will stimulate useful discussions among environmental scientists and research managers, government and funding agencies about future research direction in the field of environmental science.

One of the important constituents for improvement of scientific contribution and development in Sri Lanka is the initiative for academic, research and governance reforms in research institutions and higher education institutions.

Research and Development activities primarily depend upon financial allocation. Therefore, funds raised from other national and global agencies, play an important role in aiding research and development.

References

- Arencibia-Jorge, Ricardo and Rousseau, Ronald (2009). Influence of Individual Researchers' Visibility on Institutional Impact: An Example of Prathap's Approach to Successive h-indices. *Scientometrics* **79**: 507-516.
- Arunachalam, Subbiah (2000). National Mapping of Science - India: Life Sciences. *Information Today & Tomorrow* **19** (2000) 222-226.
- Basso S.L. & Bazzaz F.A (1998). How environmental conditions affect canopy leaf – level photosynthesis in four deciduous tree species. *Ecology* **79**: 2666-2675.
- Jeevan, V. K. J. (2002). Publishing Research Papers in Journals: Trends in Indian Institute of Technology (IIT), Kharagpur. *SRELS Journal of Information Management* **39** : 73-92.
- Joel A. T. (2003). Precaution, environmental science, and preventive public policy. *A Journal of Environmental and Occupational Health Policy* **13**: 275 – 282.
- Zheng, Yanning. (2011). Scientometric Analysis of Physics (1979-2008): A Quantitative Description of Scientific Impact. *Science China Physics, Mechanics and Astronomy* **54**: 176-182.