WHY WE NEED "CITIZEN SCIENCE" IN SRI LANKA

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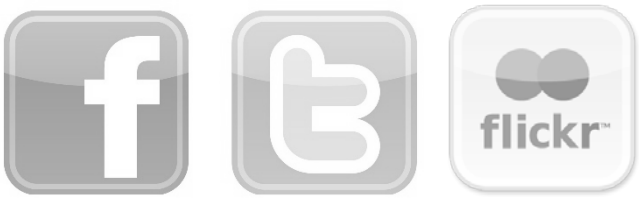
It's an era of novel approaches into biodiversity conservation is in high demand and the conservation biologists have to be more innovative to make their efforts reach a greater distance and to be successful in the current age of rapid technological development at the expense of natural resources. Scientists believe that it's only through the involvement of general public, can the nature be conserved in a non-traditional and more efficient approach where interactive conservation benefits both the nature and the society (Schultz, 2000; Miller, 2005; David Bickford *et al.,* 2012). This is commonly known as Citizen Science. Europe and North America have been using Citizen Science as an effective tool of data collection at small and mega scale and they have achieved a huge success regionally which otherwise would have been extremely unlikely (Grove, 2012). Although, these techniques have been started in the tropical region recently, it has not prevailed as much and still in a dormant stage (Wee and Subaraj, 2009; Dickinson *et al*., 2012). Sri Lanka is far behind in the use of public involvement in scientific studies and it is the appropriate time to start a new journey of scientific studies in the country.

Crowd sourcing in scientific studies, commonly known as "Citizen Science" has been long used to collect data, nation-wide in several countries (Dickinson *et al*., 2012) though it has had a new leap with the technological development and easy access of modern communication protocols (Grove 2012). The term Citizen Science was first used by Alan Irwin in 1995. Although he used the term to introduce a type of research collaboration or data gathering technique by untrained or "non-expert" individuals, basically referring to general public, recently this field has gained a new direction allowing people to actively participate in scientific research (Mueller *et al*., 2012). Thus, current Citizen Science projects can range from large data collections like *Migratory Bird Surveys* (http://birds.audubon.org/christmas-bird-count/) and *What's Invasive* to more personalized small projects such as the programs offered by *Earthwatch Institute* (http://earthwatch.org). Despite the availability of experts, large scale monitoring or studies covering a large geographic area become limited due to the constrains of access to all the area at a given time; this is where citizen science plays the most vital role, especially in ecological studies. Rediscovery of a rare ladybird (*Coccinella novemnotata*) in North America and huge collection of bird citing data in Europe available on eBird (http://ebird.org) are such example of incomparable outcomes of citizen science projects. Currently this field has been revolutionized by the readily available novel technological equipment such as built-in GPS technology, web capable handheld devices such as mobile phones and cameras which are widely available and noticeably affordable. Moreover, Web 2.0 and social networks such as Facebook,

Twitter, and Flicker have enabled the researchers to collect a large amount of data even without making contact with the data collectors. For example, Catlin-Groves (2012) performed an initial survey of geo-tagged images of "monarch butterfly" on Flicker and her observations were similar to the results presented by citizen science program called Journey North (http://learner.org/jnorth/).



Sri Lanka with its rich biodiversity is part of the Western Ghats/Sri Lanka biodiversity hotspot (Myers *et al*. 2000) which is also among the top 18 biodiversity hotspots of the world. Together with unique plant and animal assemblages, the island harbors one of the highest endemism per unite area in the region (Mattson *et al*. 2004). However, recent studies suggest that immediate actions are needed to protect this precious complex of ecosystems as they are currently under the threat of being destroyed, jeopardizing the unique biodiversity (Gunawardena *et al*. 2007). People of Sri Lanka have an ancient history of living hand in hand with the nature and protecting it for future generations and for sustainability. However, current agenda of scientific studies in the country has not found a way to reach the people in an interactive conservation platform. Beside several community based studies, there has hardly been any citizen science projects in Sri Lanka.

Although Sri Lanka is a developing country, it is a potential ecological reserve for a variety of Citizen Science projects. There is a tremendous amount of natural phenomena occurring in the country which are yet to be studied (Baldwin 1991; Gunatilleke *et al*. 2006). Not only is the lack of studies affecting the deterioration of the biodiversity in the country but also peoples' concern about the nature is also deteriorating day by day. Crowd sourcing can be efficiently used to address a lot of environmental issues in the country as well as a large amount of social matters. Hence, it can range from getting school children to collect data for small scale local studies to getting rural communities to help monitor deforestation and illegal poaching. In this way Citizen Science can improve the livelihood of the people and interaction of youth with the nature while taking the scientific studies in the country to a new level. Further, when it comes to large scale monitoring of ecological conditions such as distribution mapping of certain species or group of organisms, it is always good to have a large workforce in which non-experts play a major role as it becomes impractical for researchers themselves to collect a vast amount of data covering the entire country. Current technological exposure of the country will possibly reinforce the scientists' efforts by providing easy means of accessibility to data collectors. As for now, there are more than 10 million mobile phone users in Sri Lanka and two third of them are web enabled devices (World Bank, 2012). When properly strategized, they can be easily used to collect scientific data. Social network community in Sri Lanka is steadily increasing; for example there are over 1.2 million facebook users in the country (Wordpress 2012). Several facebook groups such as "Sri Lanka Birding Circle" (https://www.facebook.com/groups/135397896538713/) and "Butterfly Interest Group of Sri Lanka" (https://www.facebook.com/groups/153339521374784/) have already been filled with potential Citizen Science data, although no one seems to use the data to conduct surveys or other scientific studies. These tools would obviously provide very important sources for Citizen Science projects in the country.

However, there are certain reluctances among the researchers to use data collected by non-experts for scientific studies as there is no assurance of the reliability of these data. It should start from Sri Lankan researchers themselves to improve the quality of data collected by people and to use the right methods to collect reliable data avoiding fallacies. Moreover, convincing people to participate in scientific research would be another concern for starting citizen science projects in the country. To overcome this hurdle, the electronic and printed media should play an important role linking researchers with the general public. Finally it's up to the scientists to use this invaluable and important tool properly to transfigure the research culture in the country.

References:

Baldwin, M.F. (1991). Natural resources of Sri Lanka: conditions and trends. In: *Natural resources of Sri Lanka: conditions and trends*. Natural Resources, Energy and Science Authority of Sri Lanka.

Bickford, D., Posa, M.R.C., Qie, L., Campos-Arceiz, A. & Kudavidanage, E.P. (2012). Science communication for biodiversity conservation. *Biological Conservation*, 151, 74-76.

Catlin-Groves, C.L. (2012). The citizen science landscape: from volunteers to citizen sensors and beyond. *International Journal of Zoology*, 2012.

Dickinson, J. L., Shirk, J., Bonter, D., Rick Bonney, R., Crain, R. L., Martin, J., Phillips, T., and Purcell, K. (2012). The current state of citizen science as a tool for ecological research and public engagement. *Frontiers in Ecology and the Environment*. 10(6), 291-297

Gunatilleke, C. V. S., Gunatilleke, I. A. U. N. , Esufali, S., Harms, K. E., Ashton, P. M. S., Burslem, D. F. R. P. and Ashton, P. S. (2006). Species-Habitat Associations in a Sri Lankan Dipterocarp Forest. *Journal of Tropical Ecology*. 22(4), 371-384.

Gunawardene, N., Daniels, I.A. D., Gunatilleke, I. A., Gunatilleke, C. V., Karunakaran, P. V., Nayak, K. G., Prasad, S., Puyravaud, P. , Ramesh, B. R., Subramanian, K. A. (2007). A brief overview of the Western Ghats - Sri Lanka biodiversity hotspot. *Current Science* (00113891), 93(11), 1567-1572.

Mattsson, E., Persson, U.M., Ostwald, M. & Nissanka, S. (2012). REDD+ readiness implications for Sri Lanka in terms of reducing deforestation. *Journal of environmental management*, 100, 29-40.

Miller, J.R. (2005). Biodiversity conservation and the extinction of experience. *Trends in Ecology & Evolution*, 20, 430-434.

Mueller, M.P. & Tippins, D. (2012). The future of citizen science. *Democracy and Education*, 20, 2.

Myers, N., Mittermeier, R.A., Mittermeier, C.G., Da Fonseca, G.A. & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403, 853-858.

Schultz, P. (2002). New Environmental Theories: Empathizing With Nature: The Effects ofPerspective Taking on Concern for Environmental Issues. *Journal of social issues*, 56, 391-406.

The World Bank. (2012). Sri Lanka. (http://www.worldbank.org/en/country/srilanka/research) [accessed on April 10, 2014].

Wee, Y. & Subaraj, R. (2009). Citizen science and the gathering of ornithological data in Singapore. *Nature in Singapore*, 2, 27-30.

Wordpress. (2012). Facebook usage in Sri Lanka. (http://wanni.wordpress.com/2012/06/11/facebook-usage-in-sri-lanka/) [accessed on April 10, 2014].