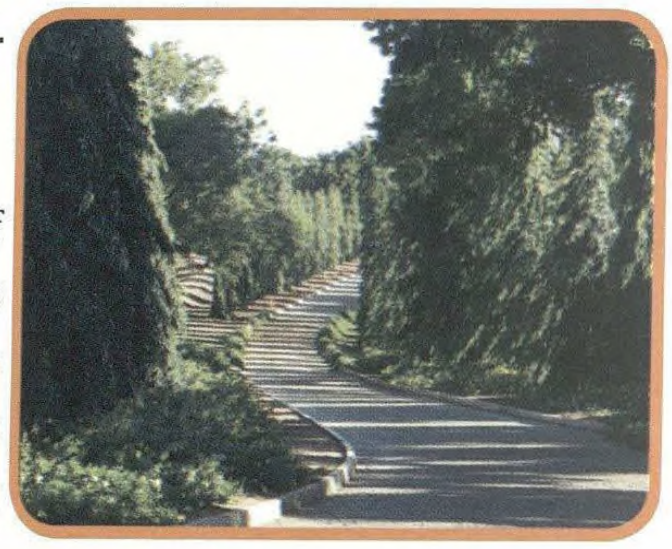
Award category 6 - Science and Technology contributions for sustainable development in areas such as energy, food and water security, and climate change

Dry Zone Botanic Gardens at Mirijjawila, Hambantota

Concept and Initiation

The site of the new botanic garden, at Mirijjawala near Hambantota in Southern Sri Lanka, was characterized by scrub jungle and dry zone vegetation. It is of sufficient size (300 acres) to accommodate the needs of a new 21st century botanic garden. Water for irrigation is available in the nearby "Baragam wila" to maintain the site. Rain water harvested within the sites can also be used where ever possible.

The main purpose of the new garden is to showcase and conserve dry and arid zone plants (ex-situ conservation). The garden will also provide opportunities for ecotourism and economic development in this area and model dry zone landscape improvement. This is the first new botanic garden in Sri Lanka in 130 years, built in the 21st century by local experts started in 2006.



Plants and techniques used for plantation

At present, there are over 200 species of indigenous plants including shrubs and climbers established at the gardens. Plant specimens are collected through plant exploration programmes mainly of threatened plants in dry zone according to the National Red list of flora. Collected plants are established at nurseries as ex-situ conservation measures for propagation.

Plants in Dry zone are adaptive to conserving water which is a limiting factor for their survival. Collection of surface runoff water, rain water harvesting, micro irrigation methods etc. are being used where ever possible.

Community work at the garden

Floriculture development activities were carried out at the garden to facilitate the growers of the area in order to empower lower and middle level nurserymen/growers in the floriculture sector and to uplift their economic standards.

There are several programmes planned for the near future such as conducting educational camps for school children and general public and establishing environmental societies among school leavers in order to promote and aware of garden activities among public.

Achieving gardens objectives

More than 200 species of dry and arid zone plants are conserved ex-situ at the gardens and will continue by conserving more plants. Botanic Garden presents an attractive visitor location both for domestic and foreign. The garden is a model dry zone landscape improvement with attractive landscape features.

Research on natural products and herbal industry in the Dry Zone are being conducted at this garden and actions will be taken to promote the herbal industry

Future plans

The long term strategic benefit of the garden lies in its ability to cultivate propagated specimens ex-situ and to promote the herbal and floriculture industries, where there is significant potential for growth internationally. Both of these industries can be developed to meet the market demand. Floriculture has been highlighted as a priority.

Southern Sri Lanka has been earmarked as a development zone for tourism, and a Botanic Garden presents an attractive visitor location both for domestic and foreign tourists. Its location at the intersection of Hambantota-Suriyawewa Road and the proposed Colombo-Hambantota Expressway will also attract a large number of local visitors.

About the winner

The National Botanic Gardens are pioneering botanical institutions in Sri Lanka. The Royal Botanic Gardens, Peradeniya (1821), Hakgala Botanic Gardens (1861) and Henarathgoda Botanic Gardens, Gampaha (1876) were established by the British to conduct experiments on exotic economic plants and explore plant wealth in the island. These institutions are responsible for all major plant introductions for economic and environmental development in Sri Lanka. Activities that followed resulted in the development of economic and plantation crops, emergence of important state departments such as Department of Agriculture (1912), Forest Department (1887) and institutions for the development of Plantation Crops such as Tea and Rubber. After the establishment of Department of Agriculture in 1912 the botanic gardens functioned as a Division under it and in 2006 the Department of National Botanic Gardens was established.

Award category 8 - Development and use of innovative applications based on advanced technologies

Establishment of the First Criminal DNA Database for Sri Lanka

For the past 12 years, Genetech as the pioneering DNA laboratory in Sri Lanka has successfully applied DNA testing in over 3500 criminal cases to identify the perpetrators of crime and to exonerate the innocent.

DNA analysis in crime investigation always requires that a comparison is made between a questioned biological sample recovered from crime scene and a known suspect. The results of this comparison are either an inclusion (DNA match) or exclusion (no match).

However, the suspect will not always be available for testing and would thus be termed "no suspects" available for comparison in DNA testing making the case unsolved. Therefore, data-basing of DNA profiles is extremely valuable in such instances. The advantage of such DNA databases in linking crimes and nominating possible suspects has prompted more than 60 countries worldwide to establish their own databases.

The work on Sri Lanka's first criminal database was initiated and completed by Dr. Ruwan Illeperuma by digitalizing and compiling more than 10,000 DNA profiles of crime scene biological evidence and 3,500 DNA profiles of convicted and arrested individuals that have been generated since 2002. The system comprises of two searchable computerized databases termed "forensic" and "arrestee"; which are compliance to international standards and are integrated and operated by standalone computer software.

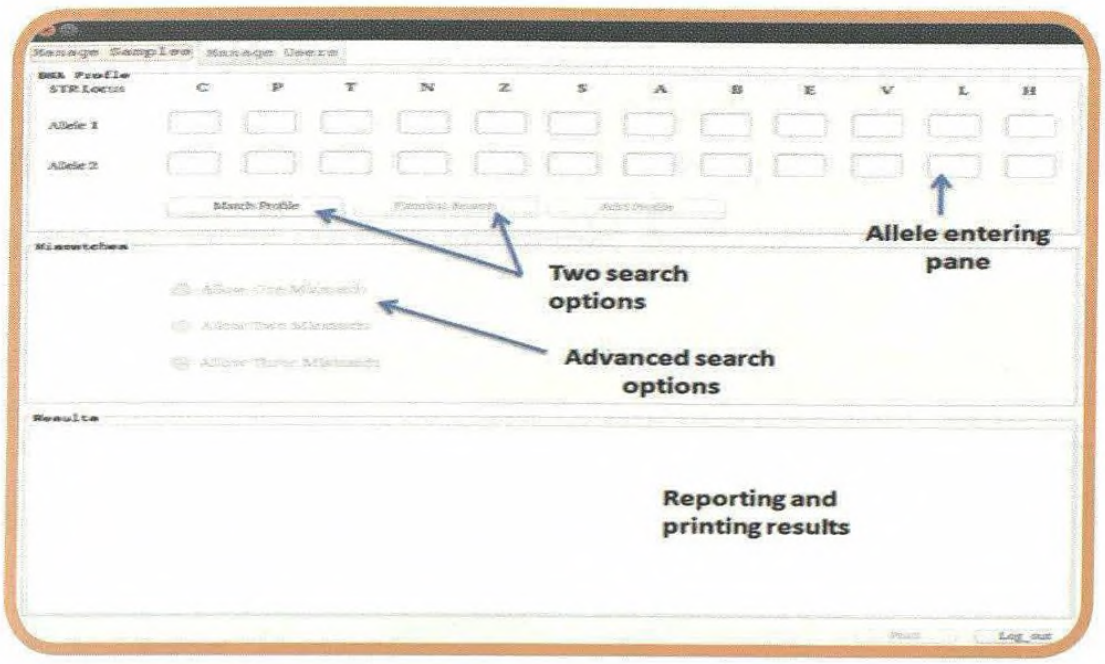
Once a query (unknown) DNA profile is entered, the system sorts out matches between crime scene evidence and known suspects who have previously been recorded ('cold-hits') and performs "speculative searches" to look for matches from all past unresolved crime.

Since an individual inherits exactly half of his DNA from each parent, the system can also perform "familial searching" to trace suspects of crime if they have any biological relatives (parents or children) in the database.

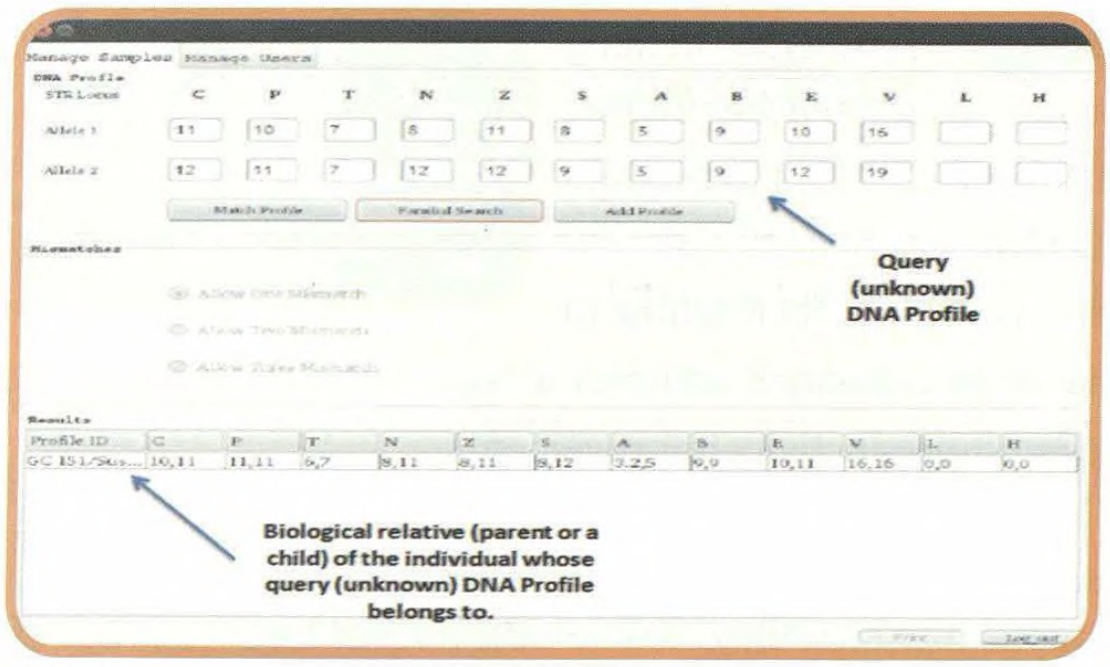
This DNA database of Sri Lanka will facilitate speedy conviction of serious criminals including murderers and rapists, while exonerating the innocent by nominating possible suspects and tracing close family relationships of an unknown DNA profile

where there are "no suspects" available for comparison. It has already been used to link several major unresolved crimes that have happened in the recent past in the country.

DNA profiles of the database could also be linked with data of other national databases such as Police finger print records and electronic national Identity card information and also be shared internationally with minimal oversight.



DNA Database 1



DNA Database 2

About the winner

Dr Ruwan Illeperuma

Dr Illeperuma is an experienced scientist in Sri Lanka in the field of Molecular Forensics. He is serving as the head of forensic section at Genetech. He is a former Fulbright scholar. He earned his PhD from the University of Colombo for the research he completed at the University of Washington, USA. He has published widely and is active as a lecturer for the Judiciary, Medico-Legal community and the Police on the use of DNA technology in criminal investigations. The focus of his research is on genetic genealogy and molecular anthropology of Sri Lankan populations including the Veddas of Sri Lanka.