

**WORKSHOP CUM SEMINAR ON THE 'SIGNIFICANCE AND CONSERVATION OF TRADITIONAL RICE VARIETIES'**



Shri. V.S.Sunilkumar, Hon'ble Minister of Agriculture, Govt. of Kerala delivering the inaugural speech

### **Rice biodiversity in Kerala**

Rice is the staple food of Kerala since time immemorial. Even a few decades back a large number of traditional varieties possessing special traits such as drought and flood resistance, medicinal and nutraceutical properties, short / long duration characteristics, height variations, and unique variations in grains such as grain color, shape, size, kernel color, puffing, popping, flattening, cooking and eating qualities were cultivated in Kerala. Varieties such as Navara and Palakkadan Matta have acquired Geographical Indication status and international acclaim. British Gazettes had documented that 2,000 to 3,000 varieties of rice were once cultivated in Kerala.

### **Decline of traditional rice varieties**

After the advent of the 'Green Revolution', the concerted institutional efforts to popularise the 'high yielding' hybrid rice varieties coupled with the deliberate measures to vanquish the traditional varieties by vested interests resulted in the disappearance of most of the land races.

### **Background of the Workshop**

SACON conducted a survey and documentation on 'Ecological and Ethno-Cultural Examination of the Rise and Fall of Rice Culture in Southern India with Special Reference to the Western Ghats' from 2012 to 2014 with the financial support of Indira Gandhi National Centre for Arts, Ministry of Culture, Govt. of India. The states of Tamil Nadu, Kerala, Karnataka, Maharashtra and Goa were covered under the survey. Altogether information about 591 traditional rice varieties was gathered.

**From the Director's Desk**

We at SACON believe in not only branching out but also in strengthening our roots. This time apart from all the magnificent research work done by members of SACON we have taken a step towards making our aesthetically beautiful campus more environment friendly and human friendly. We have installed 24 automatic solar lamps in our campus with the aim of tapping nature's abundant energy to reduce our power consumption.

We have built an 'exclusive' water hole for the elephants who are our regular visitors at the campus. All the important trees in our campus have been name tagged for the benefit of visitors.

All work and no play make Jack a dull boy. Hence we have installed a new 'table tennis' table in our Guest House. More recreational facilities will be made available on campus for the benefits of campus inmates (volley ball court, basket ball court and carom board) by the next quarter.

The last three months have been very fruitful for us. We are continuously working towards striking a balance in the ecosystem and to extend our full support in resolving the 'human and nature' conflict.

My sincere thanks to all the members of SACON for being so persistent always, and for carrying out their duties, however big or small, with total dedication.

Upwards and onwards we shall continue to move!!

Dr. K. Sankar  
Director

From Kerala information about 141 traditional rice varieties was available out of which 106 varieties are still cultivated; some varieties are found only in a few acres. Fifty five varieties are known to yield 2.5 to 3.75 M.T. /ha and 14 an yield of more than 3.75 M.T. /ha which is far above the average yield of hybrid varieties in Kerala. Some of the high yielding traditional varieties yield more than 5 M.T. /ha. Seven varieties are flood resistant, 6 are drought resistant, 14 are pest resistant, 3 are disease resistant, 7 are salt resistant and 7 varieties are with medicinal values. Regarding agronomical practices, each traditional variety require different treatments for sprouting, sowing, irrigation, harvesting and threshing. Unique cultural and religious practices associated with paddy and paddy cultivation were also documented in the survey.

In order to disseminate the information collected in the study to different stakeholders such as farmers, Agricultural Scientists, officials working in Department of Agriculture, and Agricultural University and individuals and organisations involved in the conservation of traditional rice varieties, it was decided to organise a one day Seminar cum Workshop.

**The programme**

The seminar cum workshop on the 'Significance and Conservation of Traditional Rice Varieties' was held on 5

September 2016 at Abhayam, at Koppam near Pattambi in Palakkad district, Kerala, which was jointly organized by SACON and 'Abhayam', an NGO committed to organic farming and conservation of the traditional rice varieties.

Shri. V.S. Sunilkumar, Hon'ble Minister of Agriculture, Govt. of Kerala inaugurated the programme in a function presided over by Shri. Mohammed Muhsin, MLA, Pattambi. The message by Dr. K. Sankar, Director, SACON was read by Dr. R. Jayapal, Principal Scientist, SACON since the Director was on tour abroad. Faculty of Kerala Agricultural University, Senior Officials of Dept. of Agriculture, Govt. of Kerala, representatives of NGO's and farmers involved in the conservation of traditional rice varieties from different parts of Kerala and representatives of Local Self Governance Bodies participated in the event.

In the morning session Dr. Mathew K. Sebastian, Principal Investigator of the study, SACON presented an overview of status of cultivation of traditional varieties in south India with special reference to the Western Ghats. Select participants who are prominent in the cultivation and conservation of traditional rice varieties shared their experiences. Faculty of Kerala Agricultural University viz. Prof. M.C. Narayanankutty, Prof. C.R. Elsy, Prof. Israel Thomas, and Prof. Shaji James and Dr. P.V. Karunakaran and Dr. P.R. Arun, Principal Scientists,



Group discussions in progress

SACON delivered talks on different aspects of the conservation of traditional rice varieties.

In the afternoon session group discussions were held on the following topics:

1. Problems faced by the cultivators of traditional rice varieties and remedial measures
2. Issues related to the ownership of traditional rice varieties
3. Conservation of traditional rice varieties
4. Marketing of traditional rice varieties

Results of the group discussions were consolidated and presented in the concluding session.

1. Loss of soil health, massive loss of top soil, loss of the culture of agriculture, negative influence of chemical fertilizer and pesticide lobby, labour shortage, lack of governmental and other institutional support, ineffective agricultural extension were identified as the main problems faced by the farmers involved in the cultivation of traditional rice varieties.

2. Formation of an apex body of the Kerala farmers to protect the Intellectual Property Rights (IPR) of the traditional varieties, proper identification and documentation of the traditional rice varieties, and procuring Geographical Indication status for more varieties were the issues evolved in connection with the ownership of the traditional rice varieties.

3. Identification, documentation and mapping of the traditional rice varieties of Kerala, documentation of specific characteristics, nutraceutical and nutritional studies, allocation of funds for Panchayats for the conservation of traditional rice varieties were the proposals mooted for the purpose.

4. Ensuring adequate returns for the farmers to sustain themselves, over and above the cost of cultivation, setting up an exclusive market for traditional rice varieties, a system to ascertain the original farmers and the whereabouts of their farms, ensuring a definite income for the farmers, setting up of quality testing facilities with easy accessibility to farmers were the salient suggestions made for a better marketing avenue for the traditional rice varieties.

In the end, Shri. P.K. Chellakutty, Board Member, Abhayam Trust and Joint Convener of the Organizing Committee proposed the Vote of Thanks.

## Conservation and management of cavity nesting birds in the riparian forest ecosystem

### Introduction

Birds build nests to protect themselves, their eggs, and their young from predators and from adverse weather. Several types of bird nests are recognized in the wild. These include scrape, mound, burrow, cavity, cup, saucer or plate, platform, pendant and sphere. For some species, a nest is simply a shallow depression made in sand; for



Riparian forest at Athikadavu

others, it is the knot-hole left by a broken branch, a burrow dug into the ground, a chamber drilled into a tree, an enormous rotting pile of vegetation and earth, or a mud dome with an entrance tunnel. Two important tree strata namely bole and canopy are heavily used by birds for nesting. While the cavity nesters such as parakeets, owls, barbets, hornbills, woodpeckers, kingfishers, starlings and mynas use the cavities of live and dead trees, stick-nesting birds such as kites, eagles, vultures, a few owls and some water birds use the tree canopy.

Two types of cavity nesting birds are recognized, viz. primary cavity nesting birds which excavate cavities in trees and use them for nesting and secondary cavity nesting birds that use the cavities already excavated by primary cavity nesters or naturally occurring holes. The primary cavity nesting birds are known as “Ecosystem Engineers” of the forests for their role in cavity excavation. Generally cavity nesting birds prefer diseased, dying or dead trees because it is easier to find or excavate cavities in such trees. In India, more than 100 species of tree-cavity nesting birds have been identified, but very little information is available about their breeding habits. Anthropogenic interventions such as tree felling, non-timber forest produce collection, agricultural activities alongside the forest boundaries threaten birds that nest in cavities of tree trunks and canopies. Hence a three year study was carried out in the low-elevation riparian forest of Athikadavu valley that forms part of the Bhavani River, a tributary of Cauvery and lies in the Nilgiri southeastern slopes, Western Ghats.

The project carried out from 2011-2014 looked into the following aspects namely, i) vegetation composition of woody species of the riverine forests, ii) tree species used by the cavity-nesting birds for nesting, iii) characteristics of nest trees used by birds and iv) human impacts on riverine vegetation and suggest conservation measures.

### Riparian forest vegetation

In the low-elevation riparian systems, a narrow strip of vegetation found along the river and is distinct from the adjoining vegetation type is referred to as riverine forest/gallery forest. The gallery forest is generally represented by tall and huge girthed trees. The riparian forest of the Bhavani river in Coimbatore Forest Division was found to be rich in plant wealth. It harboured 70 tree species belonging to 60 genera in 38 families. Additionally around 100 species of plants comprising shrubs, herbs and grasses were also found.

The fig family, Moraceae represented by eight tree species was found to be the most dominant family representing the arborescent flora. It appears that the predominance of figs, especially *Ficus racemosa* is associated with the naming of this location as Athikadavu, which in vernacular language refers to Athi = *Ficus racemosa*, kadavu= particular spot on the bank of a river where people bathe/cross over to the other bank. Among the trees, the genus *Ficus* has the highest number of species, (n=7). Predominant tree species recorded along the river banks comprised *Pongamia pinnata*, *Diospyros peregrina* and *Mangifera indica*.



Rose-ringed Parakeet

### Riparian Forest Bird Community

The riparian forest is rich in bird diversity. In total 157 bird species belonging to 51 families were recorded in the study. Cuculidae constituted the largest family with 12 (8.5%) species followed by Accipitridae 9 (6.2%) and Rallidae 8 (5.5%). Motacillidae, Columbidae, Dicruridae and Sturnidae were represented by 6 (4.1%) species each. Out of the 157 species, 32 species are cavity nesting birds, which include woodpeckers, hornbills, barbets, parakeets, mynas, owls and tits. Among the 157 species, 105 (66.87%) species were residents, 38 (24.20%) species were winter migrants and 14 (8.9%) species were summer migrants. Avifauna included endemic species such as Nilgiri Wood Pigeon, Nilgiri Flycatcher, Malabar Barbet and Malabar Parakeet. Presence of hornbills (Great and Malabar Pied Hornbill) is a major attraction of this Valley. Malabar Pied Hornbills are found throughout the year and Great Pied Hornbills visit seasonally while both the species are known to breed here. Presence of Lesser Fish Eagle signifies the conservation importance of this habitat. Altitudinal migrants such as Malabar Trogon, Malabar Whistling Thrush and Nilgiri Flycatcher are also found. Water birds such as Darter and egrets also frequent the water body.

### Cavity nesting birds

Thirty two species of cavity nesting bird species were found in the riverine forests of Athikadavu Valley. Major proportion of cavity nesting birds included woodpeckers, owls and mynas (15.63% each) followed by parakeets and barbets represented by 12.50% each and hornbills (9.38%). Other cavity nesters include tits and flycatchers. A total of 302 active nests of various bird species were located in the survey. Out of 302 cavity nests, 102 (33.77%) belonged to primary cavity nesters and 200 (66.23%) belonged to secondary cavity nesters. Highest number of cavities was used by Common Myna (55; 18.21%) followed by White-cheeked Barbet (44; 14.57%) and Brown-headed Barbet (30; 9.93%). Interestingly, highest number of tree species was used by Common Myna (n=22). Common Myna was found to be aggressive, often seen chasing away the competitors and usurping the nest holes.

In the study sites of Athikadavu Valley, 257 nest trees belonging to 54 species were utilized for nesting by the cavity nesting birds. The 257 nest trees included 226 live trees and 31 dead trees (snags). In all, riparian forest species such as *Terminalia arjuna* and *Mangifera indica* were favoured by several cavity nesting species. Nest tree conditions, namely live tree, dead tree, live top, dead top were assessed. Of the 102 nest cavities excavated by primary cavity nesting birds (barbets and woodpeckers) 89% were found in dead branches/dead trees. Hornbill used only live trees. In Athikadavu Valley, 257 nest trees belonging to 54 species were utilized for nesting by cavity nesting birds. Highest number of cavities was found in *Terminalia arjuna* followed *Mangifera indica*, *Melia dubia* and *Ceiba pentandra*.



Malabar Pied Hornbill

Thirteen species of snags were used for nesting by cavity nesting birds. Snags of *Mangifera indica* and *Terminalia arjuna* harboured highest proportion of nests. Nest cavities were located on varying heights from as low as 2 m to a height of 23m. Large proportion of nests (48%) was located in the 5-10m. Primary cavity nesters make nests every year afresh. Secondary cavity nesters occupy nests as well as reuse old nests. About 25% of the nests were reused by the secondary cavity nesters. In particular, cavities in *Gyrocarpus americanus*, *Terminalia arjuna*, *Sterospermum personatum* and *Mangifera indica* were found to be reused. Generally the cavities used by hole-nesters had narrower entrance and were situated at greater heights. It is inferred that the small entrance holes and location high up in trees are important for reducing predation risk.

### Conservation implications

Based on the present study, the following recommendations are made for the conservation of this important bird habitat.

**Protection of trees:** The Bhavani river bank vegetation in Athikadavu and Pillur comprised of unique species composition. The local people of Athikadavu Valley damage live trees by cutting branches and wood for various needs. Large scale fruit collection by the local communities is also likely to affect the regeneration of tree species. Hence, it is suggested that the nest trees should be protected from anthropogenic impacts and more indigenous trees may be planted over the degraded sites on the river bank.

**Conservation of snags:** Dead trees (snags) of certain species (*Mangifera indica*, *Terminalia arjuna*, *Alseodaphne semecarpifolia*, *Hopoea ponga*, *Madhuca longifolia*, *Diospyros peregrina* and *Strychnos nux-vomica*) are utilized by primary cavity nesting birds such as barbets and woodpeckers. Barbets mostly rely on snags/dead branches for nest excavation and hence snags have great conservation value. The excavated cavities in snags are in turn used by

secondary cavity nesting birds. Removal of snags would directly affect the survival of barbets and also the secondary cavity nesting birds and hence protection of these nest trees is strongly emphasized.

*Controlling expansion of agricultural activities:* Expansion of agricultural activities is another serious threat in the valley. Area of cultivation expands to riparian forests, leading to destruction of the riparian forest. This ultimately has led to the fragmentation of the Bhavani river bank vegetation. Fragmentation affects the free movement of animals and breeding of birds in the riparian habitat. Hence, measures need to be taken by the forest department to control the expansion of agricultural activities alongside the river banks.

*Control livestock grazing:* Hundreds of goats and domestic cattle are left free in the forest areas which extensively browse on herbaceous vegetation including the tree seedlings thus affecting forest regeneration. Measures need to be taken up to control livestock grazing in forest areas.

With the cooperation of NGOs, awareness programs need to be organized for the local communities about the livestock grazing impacts, importance of conserving local biodiversity and need for its conservation.

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## Participation in International Conferences

### Student Conference on Conservation Science

The Student Conference on Conservation Science (SCCS) series conducted in Cambridge, Australia, Beijing, Bangalore, New York and Hungary is the only international series of conservation conference aimed at student community exclusively. SCCS Cambridge is the foremost one which also has an internship program for a period of one month. SCCS gives opportunity to over 100 students from all over the world to present their doctoral work which include about 30 talks and 70-80 posters. The SCCS Miriam Rothschild Internship provides scholarship for a few selected students each year to do a one month internship in any UK based institutions based on area of interest.

Subsequent to my selection, I participated in the SCCS- 2016 held during 19<sup>th</sup>-24<sup>th</sup> March 2016 in the Department of Zoology, University of Cambridge along with 157 student delegates from 49 countries. The presentations included 31 talks and 83 posters. The Miriam Rothschild Travel Bursary Programme enabled 14 students from developing countries to participate in the SCCS and to attend a tailor-made training course followed by an internship at a UK conservation organization. I gave an oral presentation on ‘Conservation implications of elevational diversity patterns: a case study on reptiles in the southern Western Ghats of India’. During my one month internship with the Natural History Museum (NHM), London, (25<sup>th</sup> March-23<sup>rd</sup> April 2016), I worked with Dr. David Gower on ‘the taxonomy and conservation planning of burrowing snakes in the Western Ghats’. Prior to the conference, I attended a 3 day course on ‘Social survey design in Conservation Science’. I also delivered a talk at Zoological Society of London (ZSL) about my research work and reptiles of Agasthyamalai Hills.

### The World Congress of Herpetology

The World Congress of Herpetology (WCH) is a prestigious international platform for the herpetologists around the world to meet and discuss their work. The WCH happens every 3-5 years. ‘The 8<sup>th</sup> World Congress of Herpetology’ was held in Hangzhou, China from 15<sup>th</sup>- 21<sup>st</sup> August 2016. Seven hundred herpetologists from different parts of the world, including eight researchers from India, presented their work. I was among the 43 researchers who also received student scholarship to attend the meeting and present my paper. The WCH8, China gave me a great platform to present my current research work and to meet renowned herpetologists from various countries. My talk in WCH8 was on ‘What drives the diversity patterns in reptiles along an elevational gradient? A case study from Agasthyamalai



Hills, Western Ghats, India'. The feedback and the discussions during my presentation gave me more insights to further research in the topic.

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## Training Workshop on MobileGIS

A training workshop on MobileGIS was conducted on Thursday 14 July 2016 in the Boardroom of SACON which was attended by 7 faculty members and 17 Ph.D. Scholars/Interns/Research Fellows of SACON. The workshop focused on two mobile applications, EpiCollect and OsmAnd, the former one for collecting geotagged field data while the second one helps in digitising the transect or area covered during the field work. The workshop started with a presentation on introduction to MobileGIS and EpiCollect and proceeded through giving hands on training in developing 'PROJECT' and 'DATA COLLECTION FORMS'. Later the participants developed separate 'PROJECT' and 'DATA COLLECTION FORMS' for conducting the field work in SACON Campus. Two formats were prepared on themes, viz., (i) birds and (ii) trees. The participants collected data pertaining to birds and trees of the SACON campus and they uploaded (synchronised), projected and saved as vector model (point) format using GIS tools. A session on OsmAnd, another GPS based application was conducted in the afternoon which enabled the user to digitise the field tracks or area covered during the field study. Dr. P.V.Karunakaran, Principal Scientist, Landscape Ecology Division, SACON was the Resource Person.



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## Visit of Dr. Lalit Kapur, Advisor and Dr. U. Sridharan, Director, Ministry of Environment, Forest & Climate Change, Govt. of India

A two member committee of Dr. Lalit Kapur, Advisor and Dr. U. Sridharan, Director (Southern Regional Office, Bengaluru), MoEF&CC, Govt. of India visited SACON on 7-8 July 2016 to evaluate the performance of SACON. This committee was constituted by MOEF&CC to evaluate the performance of SACON under its Centres of Excellence Scheme.



## Dr. Anandi Subramanian, IES, Senior Financial Advisor, Ministry of Environment and Forest & Climate Change, Govt. of India visits SACON

A team consisting of Dr. Anandi Subramanian, IES, Senior Advisor, Shri. Hari Singh, Deputy Secretary, Shri Kumar Rajnish, National Programme Coordinator, ENVIS Cell, and Shri. Shoyab Ahmed Kalal, Deputy Director, MoEF&CC, Govt. of India visited SACON on 8<sup>th</sup> September 2016. The programme was part of the Committee's visit to different ENVIS Centres in the country under MoEF&CC. Dr. Subramanian interacted with the Faculty in a formal gathering in the Boardroom and faculty members briefed the Committee on their areas of work and different research projects handled by them. Thereafter she was taken around SACON campus and was introduced to different facilities available in SACON.



## Visit of Dr. Madhumita Biswas, Director (RE-Research), MoEF &CC, Govt. of India

Dr. Madhumita Biswas, Director (RE-Research), MoEF &CC, Govt. of India, visited SACON on 19<sup>th</sup> August 2016. The faculty explained the focal areas of their concerned divisions and about the ongoing research projects. Dr. Biswas assured all the support from MoEF &CC to SACON for taking up research projects which is relevant to environmental conservation contributing to people's welfare. She also visited different divisions and facilities of SACON.

## Independence Day Celebrations – 2016



National Flag hoisting by Dr.K.Sankar, Director, SACON



SACON celebrated 70<sup>th</sup> Independence Day on 15 August 2016. Dr. K. Sankar, Director, SACON hoisted the tricolour and delivered the Independence Day speech. He exhorted the faculty and staff of SACON to rededicate ourselves for nation building by working towards the goal of environmental conservation with commitment. A friendly volleyball match among the faculty, researchers and administrative staff of SACON and distribution of sweets were part of the Independence Day celebrations.

On the occasion Mr. A. Devaraj, Office Attendant and Ms. M. Jayageetha, LDC were honoured for their dedicated service to SACON.

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