

# Nominating the Bee Trees of Ramagovindapura as a World Heritage Site

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## Abstract

For more than 15 years the banyan and peepal (*Ficus benghalensis* and *Ficus religiosa*) trees of Ramagovindapura have hosted hundreds of colonies of the Giant Asian Honey Bee (*Apis dorsata*). The pollinating efforts of these bees have (according to the villagers) increased the crop yields of the surrounding area, their defecation flights have enhanced soil fertility and they have put the village on the map as a tourist attraction less than 40 kilometers from the Indian city of Bangalore. An opportunity exists to set aside and protect these valuable natural treasures as a World Heritage Site (WHS); a long and burdensome project. At one point in 2008 there were plans on the books to turn the areas into Special Economic Zones slated for development; local beekeepers and ecologists managed to organize and thwart the plan. However, as long as the area exists unprotected there will be threats such as the “New Integrated Townships in the Bangalore Metropolitan Region” proposal which may threaten the area. These plans, which are opposed by the agricultural residents of the Nandagudi township and the village of Ramagovindapura, are most likely not in the best interests of the bees nor the local farmers. As part of their agenda, the recently formed organization, “Indian Pollinator Initiative” (IPI), has decided to pursue the nomination of this important area for recognition as a World Heritage Site. IPI is eliciting support from entomological societies, apicultural associations, nature groups and ecology advocates. This paper documents the current status, the imminent threats and the way forward to nomination.

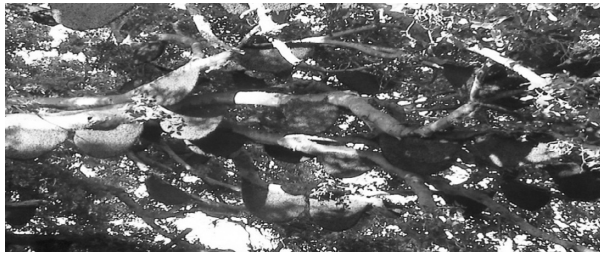
## INTRODUCTION

The Giant Asian Honey Bee (*Apis dorsata dorsata*) is distributed across most of SE Asia and the Indian Subcontinent with geographically isolated subspecies confined to population pockets (e.g. *A. d. breviligula* in the Philippines and *A. d. binghami* on Sulawesi in Indonesia). A closely related species, *Apis laboriosa*, is restricted to cliff nesting in higher elevations across the Himalayas to as far east as Vietnam (Trung *et al.*, 1996). Frequently *dorsata* are aggregate nesting (many colonies nesting in close proximity but not necessarily related) on trees, cliffs

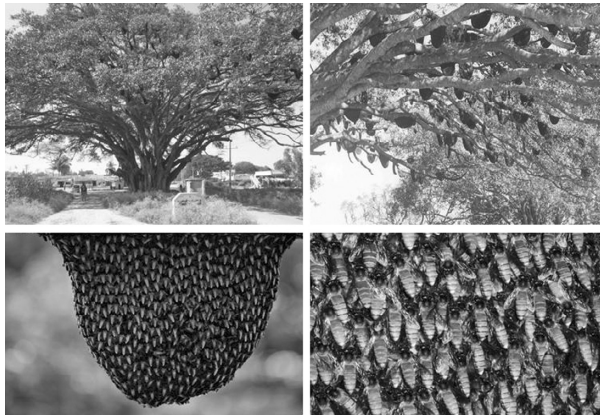
and man-made structures such as water towers, billboards and tall buildings with scores of nests frequently reported in one location (personal observations both authors). The factors influencing the nest site selection by *Apis dorsata* has been reported (Reddy, 1988). In an agricultural area some 38 kilometers north of the city of Bangalore (Karnataka, India), a high concentration of nesting *dorsata* (as many as 2000 colonies in 11 trees within a 5-7km radius; see Table 1) is found; setting the record in the concentration of nesting *dorsata* bees (Fig.1).

The rural agricultural setting where the bees are nesting has, in the past, fended off urban-sprawl governmental

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**Fig. 1.** Right - January, 2010, some of the 630 colonies of *Apis dorsata* nesting in a banyan tree (*Ficus benghalensis*) in the village of Ramagovindapura, near Nandagudi, Bangalore.



**Fig. 2.** Full view of Bee tree, Banyan tree, *Ficus benghalensis* with *Apis dorsata* nests (upper) and the nest of *Apis dorsata* with bees.

development plans including a Special Economic Zone (SEZ) initiative and an attempt by the Bangalore Metropolitan Region (BMR) to develop a “satellite city” in the region. Although the need for rational expansion of the rapidly growing city of Bangalore cannot be dismissed, little consideration has been given, nor input taken from the villagers. The effects of urbanization on the *dorsata* bee populations would be understandably negative, primarily because of loss of forage potential.

The authors, with the support of the International Insect Science Congress (IISC), Apimondia (World congress on beekeeping), Asian Apiculture Association (AAA), the Indian Pollinator Initiative (IPI), and various apicultural, agricultural and environmental organizations, are hoping to have the area surrounding the bees trees nominated a World Heritage Site (WHS) because of the ecological, natural, and educational (benefits of pollinators) aspects of the site. There is a long road ahead to accomplish this goal.

## LOCATION

Bangalore (metropolitan population 8.7 million-2011; *Wikipedia*) is the 5<sup>th</sup> most populous metropolitan area in India (*Ibid*). It is well known as the hub of IT (Information Technology) in India; it is among the top 10 preferred entrepreneurial locations in the world (Economic Times of India 2012), and is the second fastest growing major metropolitan city in India; but the expansion of Bangalore confronts substantial pollution along with other logistical and socio-economic problems. Not far into the countryside rural residents farm as they have for many generations growing grains, fruits, vegetables and are normally self-sufficient. To date the locals have been successful in warding off metropolitan expansion but as land values, encouraged by speculators, skyrocket, it becomes harder to resist the temptation of a one-time cash sale for immediate gain and perhaps with little regard for the security of future generations.

The villagers are well aware of the pollination efforts and benefits of the honey bees in the area (an attitude to be disseminated); they claim they can get five harvests per year (as opposed to four) all attributable to the presence of the bees. Though not on the “must see” list of casual visitors (except perhaps bee enthusiasts) visiting Bangalore the area has potential as an eco-tourism destination, a source for organically produced vegetables and crops, and a quiet break away from the cacophony of Bangalore; all within a short drive from the city center. Designation as a World Heritage Site will provide the necessary environmental protection so the area would be ecologically protected for generations to come.

The village of Ramagovindapura is located in the Nandagudi Township and is primarily an agricultural zone, there are several granite quarries in the vicinity, a few Hindu temples and the area is near the locally-famous Nandi Hills a large granitic pluton NW of the city. Some of the *Apis dorsata* bees are present at the location on a year-round basis but the majority of the colonies migrate to parts unknown during part of the year. Typically the large majority of the bees begin to arrive in October of each year, the population swells to the thousands by late January, honey is sometimes harvested in March and the

bees will depart by April leaving a few colonies behind.

Other *Apis* species exist in the area including *Apis florea* and some managed, as well as feral colonies, of *Apis cerana*. Currently, to our knowledge, there are no colonies of *Apis mellifera* (the imported European honey bee) in the area. If the area was successful in obtaining designation as a WHS, the importation of non-native *Apis mellifera*, with its potential of disease importations, could be banned.

## SOCIAL AND ECONOMIC IMPLICATIONS OF WHS DESIGNATION

### Agricultural aspects

Contrary to many agricultural rural residents the villagers in the Nandagudi/ Ramagovindapura area are well aware of the benefits of pollination and the need to protect indigenous species of pollinators. A report from Africa concludes that 20-30 colonies of *Apis dorsata* can deposit 800-1200kg of N<sub>2</sub> fertilizer per year spread in the defecation area (Annamalai, 2012). If substantiated, this is a significant source of “free” fertilizer, adding to the organic image desired for the area.

One of the project goals which will be proposed is to turn the WHS zone into a model organic farming area with on-going training sessions for residents on IPM (Integrated Pest Management), organic farming methods, vermiculture, composting and other bio-friendly techniques. Casual conversations with Bangalore residents indicate a willingness to travel to the area with the assurance of procuring high-quality, organically-produced food items. Bangalore, concurrent with its exponential growth, has a high percentage of upper-middle class residents willing to spend money for quality foods and honey. This will benefit the farmers and village residents by providing increased prices for organically-grown food items as well as the opportunities for medium to small business enterprises.

### Economic aspects and opportunities

Beside the enhanced opportunities in the agricultural sector other economic opportunities exist. These can take the form of agro-tourism (spend a couple days on a rural farm in India), homestays, souvenir sales, handicrafts, local tour-guide services (encouraging school children to pursue English language and biodiversity studies) sales of services (food and snacks), local transportation (auto, bicycle

**Table 1.** Number of bee colonies recorded during the last 16 years (1998-2013) and the income generated through honey harvesting

Year	Number of <i>Apis dorsata</i> colonies <sup>1</sup>	Number of colonies harvested <sup>2</sup>	Income generation <sup>3</sup>
1998	252	70	Rs. 12,000
1999	310	110	Rs. 21,000
2000	370	150	Rs. 32,000
2001	410	150	Rs. 32,000
2002	432	170	Rs. 34,000
2003	410	160	Rs. 30,000
2004	442	165	Rs. 32,000
2005	475	150	Rs. 30,000
2006	566	160	Rs. 34,000
2007	570	180	Rs. 36,000
2008	625	200	Rs. 38,000
2009	617	*	
2010	630	*	
2011	620	*	
2012	622	*	
2013	615	*	

<sup>1</sup>Number of colonies counted in one tree only in the village of Ramagovindapura.

<sup>2</sup>Average number of colonies harvested from one tree (Ramagovindapura) over 11 years ≈ 148. After 2009, honey harvesting was prohibited.

<sup>3</sup>Average income for village (11 years)=Rs.30,100 (≈\$548 USD).

rentals, horse carts, etc.) and farm gate sales of produce and honey.

### Educational aspects and opportunities

If nominated and hopefully selected as a WHS the Nandagudi/Ramagovindapura bee trees will be unique as the world's first honey bee WHS. On the western slope of the Southern Ural Mountain in Russia (Bashkortostan region) a current WHS, the "Bashkir Ural", occupies a territory of about 450 square kilometers which encompasses a state entomological wildlife reserve "AltynSolok" (which means "golden bee tree") designated to conserve and insure the traditional methods and techniques of beekeeping with local strains of *Apis mellifera* are preserved (Bashkortostan Republic info 2007). Its designation as a WHS includes other cultural and historical factors thus cannot be considered solely entomological.

The general public is woefully ignorant of the role that honey bees and their pollination efforts play in our lives and food security-by establishing the WHS at Ramagovindapura it will help raise awareness of the vital role of pollinators and the need to protect them. Information booklets and brochures would be made available as part of the outreach education effort. Schools could have field trips to the area and it could become a "tourist destination" especially for the environmentally-aware tourist segment.

### Steps to nomination as a WHS

When the authors first proposed the concept it seemed like a pretty straightforward task but after only a little checking we realized that it will be an onerous multi-year project with no guarantee of success. Consulting the web resources we found several booklets outlining the process; Preparing World Heritage site Nominations manual (138 pages), World Heritage Information Kit (32 pages), Operational Guidelines for the Implementation WHS convention (175 pages), plus sites offering international assistance- from which we plan to seek assistance. To quote from the WHS nominations manual - "Along with increasingly comprehensive requirements, the preparation of nominations has become an important, but rather complex process which requires a good understanding of the various requirements. The participation of local people

in the nomination process is also essential to enable them to have a shared responsibility with the State Party in the maintenance of the property, and has to be strongly encouraged." (UNESCO 2011).

"Lack of preparation time is the biggest enemy of successful nominations. Far too many are prepared against unrealistically short timeframes. It can take at least a year to set up appropriate support mechanisms and gather material, and a further year to write the nomination text and consult stakeholders. When research is needed, protection has to be achieved, and new management systems put in place and documented, so the process might take much longer. If the aim is a successful nomination that leads to inscription on the World Heritage List and long-term conservation and presentation of the property, a realistic timeframe should be allowed. Too often, lack of adequate preparation time leads to deferred or referred nominations, which is frustrating for States Parties, the World Heritage Committee and the Advisory Bodies. Sometimes political commitments are made which set an unrealistic timeframe for preparing a nomination, resulting in a nomination dossier which is inadequate and not ready for evaluation." (Ibid).

The concept of "Outstanding Universal Value" is paramount and underpins the World Heritage Convention concept. The basic purpose of nominations is to describe what a property consists of, why it demonstrates potential Outstanding Universal Value, and how this value will be sustained, protected, conserved, managed, monitored and communicated.

### Tentative list

The first step a country must take is to make an "inventory" of its important natural and cultural heritage sites located within its boundaries which are considered to be of cultural and/or natural heritage reflecting potential Outstanding Universal Values, and therefore suitable for inscription on the World Heritage List. It is then placed on the list for the particular country to submit for consideration as a WHS.

By preparing a Tentative List and selecting properties from it, a State Party can plan when to present each nomination dossier for a particular property. The World Heri-

tage Centre offers advice and assistance to the State Party in preparing this dossier, which needs to be as comprehensive as possible, making sure the necessary documentation and maps are included. The nomination is submitted to the World Heritage Centre to check that it is complete. Once a nomination file is completed the World Heritage Centre sends it to the appropriate Advisory Body/ies for evaluation.

### Short task list

As the process moves forward there are several baseline tasks which must be done which will form a foundation for the proposal; they include but are not limited.

- 1) Defining the boundaries of the proposed area and the all-important buffer area.
- 2) PRA discussions with village stakeholders detailing their inputs.
- 3) Socio-economic impact studies.
- 4) Negotiations with Road Commissions to enhance accessibility.
- 5) Negotiations with village stakeholders as to their desires for an organic-based agricultural zone and community enforcement (if practical).
- 6) Promotion of the concept and garner of support from organizations, State bodies and individuals.
- 7) Scientific studies including, but not limited to, (perfect venue for University student research).
  - a. Migration patterns of the dorsata.
  - b. Flight range and forage patterns.
  - c. Value of pollination and fertility contribution.
- 8) More ideas.

### Selection criteria

To be included on the World Heritage List, sites must be of Outstanding Universal Value and meet at least one of ten criteria, as well as the relevant conditions of integrity and authenticity and requirements for protection and management.

### The bee trees as a natural world heritage site

The world heritage convention defines natural heritage as 1) Natural features consisting of physical and biological

formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view; 2) Geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation; or 3) Natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty (UNESCO 2011).

The first category best reflect meeting the criteria in Nandagudi/ Ramagovindapura in the opinion of the authors. Briefly there are ten criteria for the selection of Cultural or Natural Heritage Sites, and three of which in the opinion of the authors pertain to Nandagudi/Ramagovindapura. Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance. Criterion (ix): be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals. Criterion (x): contain the most important and significant natural habitats for in situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation (UNESCO 2011).

## CONCLUSIONS AND DISCUSSION

In conclusion the area in the Nandagudi/Ramagovindapura township north of the city of Bangalore holds a high and unique value as a living pollinator exhibit, demonstrating with spectacular force the value and importance of pollinators (especially *Apis* spp.) and the need for their protection. The road to being nominated on the list of potential World Heritage Sites is a long and arduous journey requiring a significant contribution of time and support. With the proximity to Bangalore University and its concurrent reputation as “excellence in apiculture and agriculture” it offers young Indian (as well as International students) an opportunity for field research on *Apis dorsata*

in a convenient and proximal location. If studies can be rapidly implemented they will add greatly to the efforts to nominate the areas as a World Heritage Site.

As a demonstration of support the authors are requesting either a resolution be passed or a letter of support submitted by the 4<sup>th</sup> International Insect Science Congress, February 1-17<sup>th</sup> 2013, Bangalore India in favor of establishing the bee trees of Nandagudi/Ramagovindapuraasa property for consideration for nomination as a World Heritage Site. Resolutions of support are also being sought from Indian Pollinator Initiative (IPI), Asian Apicultural Association (AAA), Apimondia (meeting in September 2013 Kiev, Ukraine), 2<sup>nd</sup> Global Conference on Entomology, 12<sup>th</sup> Asian Apiculture Association Conference, April 23-28, 2014 Antalya, Turkey and other entomological-oriented associations, Departments of Apiculture and Agriculture at National, State and University levels worldwide as well as environmental action groups. Individuals who are interested in contributing to these efforts are urged to contact either or both of the authors.

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