



The vanishing voices of our cities

Text and Photographs by Seshadri K.S.

Little, unforeseen experiences often change people's lives and perspectives. In the 1990s, when I was still in school in Bangalore, we had a quaint garden surrounded by several vacant plots in a densely wooded area near our home in Mathikere. The house also had a wide courtyard. One dark, rainy night, I remember looking out of my window and seeing several green frogs hopping around our courtyard, obviously gorging on the many insects that were attracted to the lights. I was mesmerised and this childhood brush with the amphibian world blossomed into a lifelong fascination with frogs. Years later, as our garden gave way to home expansion, every inch of visible mud around our home was covered with concrete to banish bandi-

coot rats and snakes. Somehow, a toad still managed to sneak into our kitchen, leaving domestic pandemonium in its wake. I remember picking the creature up, carrying it in a polythene bag and depositing it in the safest place I could find, nearby, in a drain. A decade later, I realised how, under my very nose, the process of urbanisation was taking such a major toll on small and uncharismatic species such as frogs and toads, the first four-legged vertebrates to have stepped on land about 360 million years ago.

Frogs in our cities

And yet, despite our ignorance, virtually all Indian cities, including Bangalore, continue to offer a home to a rich diversity of frogs and toads. An impressive 30 species of frogs

have been recorded in Pune, more than 16 in Bangalore, and about 14 in Pondicherry. Experienced survivors, frogs are using all their evolutionary capabilities to stay alive, but they are in sharp retreat. Only a few decades ago, all one had to do to see a frog was to step out of the house on a rainy night. No longer. Many of our amphibians have lost the race against the sheer pace of urbanisation, and once-common frogs and toads are largely restricted to the outer limits of the city where a few tracts of unmodified amphibian habitats still exist.

ABOVE This aquatic green pond frog *Euphlyctis hexadactylus*, the only known frog that eats vegetation, shows a decided preference for plants and some flowers over insects. Unfortunately, this once-common species from peninsular India and Sri Lanka is now struggling for survival in the face of rapid urbanisation.

My interest in frogs seemed to grow in inverse proportion to their dwindling habitat. The earliest amphibian (*Triadobatrachus sp.*), I learned, evolved from a fish-like organism. During the Carboniferous and Permian eras (300-250 million years ago), the number of amphibian species increased, showcasing a diversity of characteristics and physical features. All ectotherms, they are still highly dependent on atmospheric temperature and moisture, slight variations in which can have profound impacts on their behaviour. It is for this reason that they are often referred to as barometers of the environment and of climate change.

The future of frogs

Amphibians may have survived the impacts that wiped out dinosaurs, but today they face unprecedented threats from human activities that ignore their habitat requirements and limit the scope of their movement, development, and eventually, their survival.

Small puddles in vacant land, fountain tanks in gardens and large lakes, once common in cities, were perfect habitats for frogs and toads. With increasing human population, rapid urbanisation has become a continuous process where wilderness areas are relentlessly converted to residential and industrial layouts, leaving little space in the hearts and minds of people for small creatures like frogs. Even the small puddles and slushy areas in and around our homes have been eliminated, filled with concrete and utilised with the singular goal of accommodating the burgeoning number of people. Agricultural areas near cities as well as natural wetlands are encroached upon. With fragmentation and loss of habitats, frogs are unable to even move into other habitats, leaving them isolated, and, quite literally, condemned.



TOP Asian common toads breed in still and slow-flowing rivers, ponds and pools. They have adapted well to urban spaces, with adults hiding underground, using leaf litter, logs and rocks as protection. Seen in large numbers post-monsoon, these toads are common across South Asia, yet are threatened by climate change.

Urbanisation is synonymous with roads and with roads, comes traffic. Not only do frogs get run over by speeding vehicles, the more complex issue of isolating populations and causing what is called a 'genetic drift' (where the diversity of genes in populations may be diminished by inbreeding), leaves no doubt that roads and other linear intrusions have far-reaching negative impacts on frogs and their immediate ecosystems. With increased noise from traffic, studies have indicated that male frogs, which use acoustic communication to find mates, start calling at a higher frequency and pitch in order to be heard by the female. The tremendous loss in energy they face as a result of this effort could eventually prove to be detrimental. There have also been incidents where frogs postpone their breeding activity later into the night, when traffic noise is reduced, or vocalise only during the short intermissions of silence in between traffic noise.

While a majority of waterbodies and lakes are gone, a handful of those that remain are in a derelict state, with sewage flowing into the water, causing eutrophication (an increase in

nutrient content that leads to 'algal bloom' and disturbs the lifecycle in aquatic ecosystems). With industrial waste, too, being poured into these lakes, heavy metal concentrations rise and pollution levels soar. The larger water catchment areas are also modified, leading to reduction in the flow of water. Such ill-maintained lakes become less hospitable to frogs and are an eyesore in any city. They are desperately in need of regeneration.

Additionally, many well-meaning human interventions cause unforeseen damage to frog populations. Engineering solutions like the development and maintenance of tanks, lakes and other such waterbodies are a case in point. In this mode of maintenance, the shoreline is dug up with a land mover, and the mud is dumped on the bund and around the shore – increasing the height of the embankment. A walking track is later built on it and transfixed with bright lights. The resulting slope or embankment is pitched with boulder stones.

This may appear aesthetically pleasing, but the stone pitching plunders the important ecological components of the tank, such as the natural muddy slope, vegetation cover and leaf litter on which almost all frogs in urban areas depend. Many seek to move from the water to surrounding areas – an attempt that is thwarted by the physical barriers created by raised embankments lined with stones.

Many of our gardens, especially those near lakes, sport clean, manicured lawns that are kept healthy with a continuous supply of water. Unfortunately, these also deprive frogs

BELOW The building of high banks with stone pitching around natural lakes and ponds causes severe harm to the aquafauna of such waterbodies. This is clearly seen in the Lalbagh Lake, Botanical Gardens, Bangalore, where the quest for beautifying the lake involves re-engineering that quite literally kills frogs and toads.



of the leaf litter and bare earth that make for ideal habitats. Any leaf litter that collects on such lawns is gathered and set on fire, effectually clearing away everything in their path, and posing the greatest threat to fauna like centipedes, millipedes, frogs and snakes.

Frogs face other problems. They are caught for human consumption, and though the collection of frogs for laboratory dissections is now banned, small-scale poaching continues to threaten their existence. A young boy I met while counting frogs with colleagues near a remote lake in Pondicherry said: "These big green frogs (later deduced as the common pond frog *Euphlyctis hexadactylus*) are a local delicacy. When the water levels go low, we go in small groups and hit the frog with a thorny *Prosopis/Acacia* twig. The long thorns go through the frog and we pick it up and sell it in local markets for about Rs. 60 per kilogramme. The legs taste like chicken meat." I once came across half a sack of about 50 bull frogs *Hoplobatrachus tigerinus* (earlier known as *Rana tigerina*) that had been seized by forest officials in the city of Calicut. The person carrying the sack, I was told, threw it away on seeing the officials and escaped. The killing is unremitting.

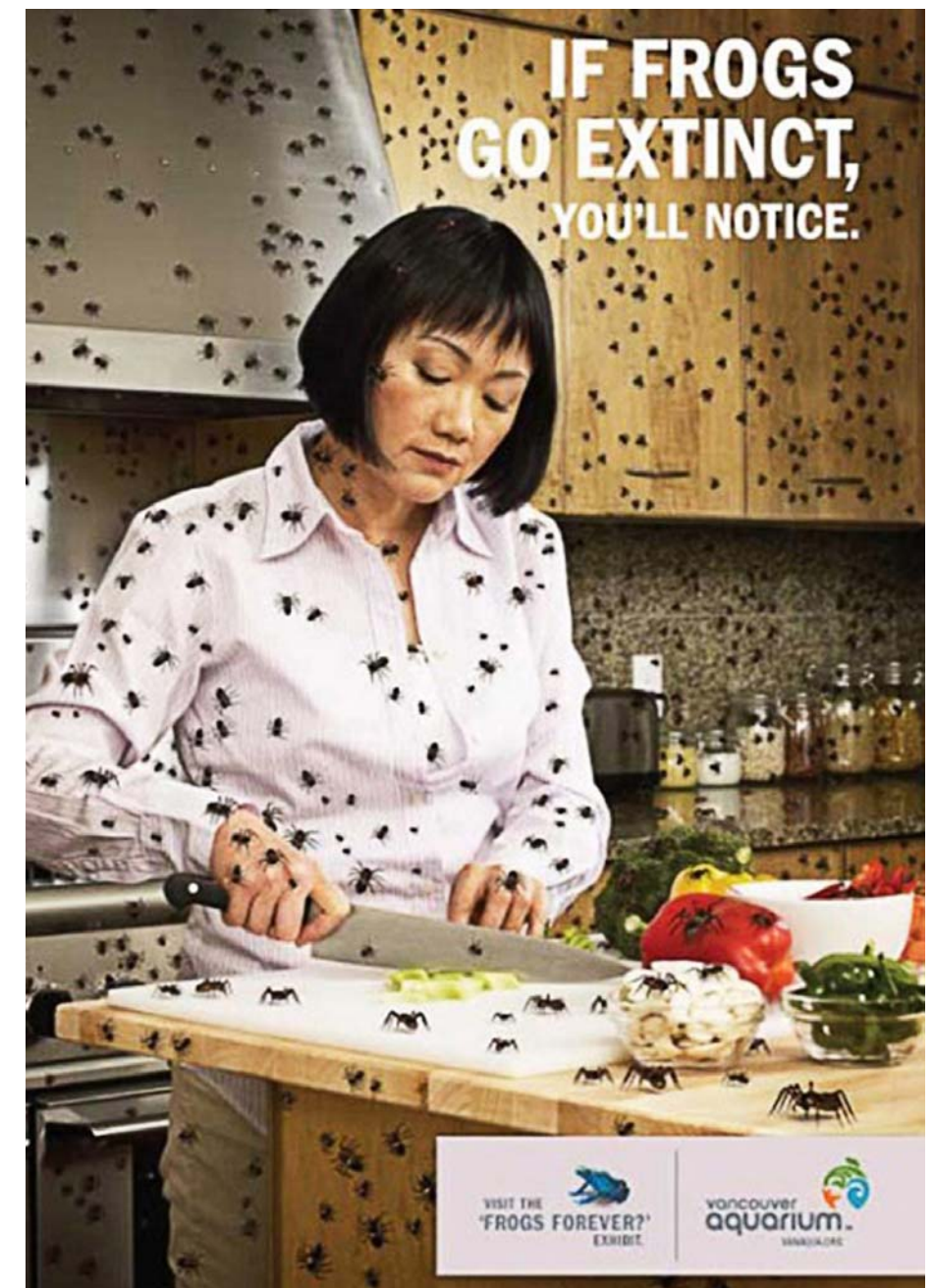
We know not what we lose

Frogs and toads are primarily insectivores, keeping pests like mosquitoes under control by feeding on them. They act as conveyor belts in our ecosystem, by means of which energy flows from insect groups to vertebrate groups – thus forming a vital ecological link in the food chain. By damaging their habitats, insect species that frogs prey on thrive unchecked, as depicted in this innovative poster (right) by the staff at the Vancouver Zoo.

Each day, our ignorance leads us to become more impoverished. We no longer spend our evenings on the house verandah, listening to the chorus of frogs. We no longer want wooded areas or gardens around our homes, preferring instead to opt for more space for people and their vehicles.

As for the frogs, out of sight is not merely out of mind, it is out of our existence.

It has been a decade since I last saw a frog on the streets of my neighborhood, let alone in the courtyard of my home. It would not be



ABOVE This innovative poster, created by the staff of the Vancouver Zoo, attempts to communicate the potentially catastrophic effect of eliminating the world's frog and toad populations.

surprising if the children and youth of today are unaware of the joy of listening to a frog orchestra on a rainy night.

Cities are meant to develop, I suppose there is no denying that. But is it unreasonable to expect planners to display a little more ecological sense when designing our cities and modifying our landscapes? Perhaps it is time that we let frogs take one leap closer to our hearts by recognising and accepting that their presence adds more than just ambience to our lives. These little creatures, which have

outlived the dinosaurs, are caretakers of the Edens in which we live. We do them no 'favours' by enabling them to live. Most of them will probably outlive us anyway, as we do not have the ability to undertake the life-saving ecological tasks they fulfill 🐸

Several attempts are being made to popularise frogs in our cities. The Bangalore's Frogs at Risk! poster by Seshadri K.S., Krishna M.B. and Sunil Kumar M., 2012 is being distributed free of charge in Bangalore. See the poster at www.sanctuaryasia.com.