Rats, bats and traps: indigenous methods of vertebrate pest control in the Maldives

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For most Maldivian farmers, animals and agriculture just do not go together. There are three major vertebrate animal pests on these islands and when combined these can cause havoc with most crops. Farmers have devised many ingenious and practical methods to rid themselves of these pests, as will become apparent from this article.

For hundreds of years, vertebrates have caused serious loss to agricultural production on the tiny atolls of the Maldives. Today is no different, as Mariyam Mohammed stands in her home garden surveying last night’s damage. This morning, Mariyam went into her garden to collect coconuts and curry leaf to prepare the morning breakfast. Instead, she found the leftovers from a night of feasting by the island’s rats and fruit bats. Rats had gnawed into many of her valuable coconuts and littered her garden floor with the empty nuts. They had nibbled at the ripening papayas that she had hoped to use for the large meal that she had to prepare for her dead mother's fatehah.

To make matters worse, fruit bats had gorged themselves on the tiny jeymu (Munitingia calabura) berries that her young daughters enjoyed eating so much. Later she would have to go to the village store and buy them some boiled lollies for their school lunch break. On her way back to her cooking house, Mariyam lets out a high piercing cry. Before returning to their daylight roosting site the fruit bats had left their characteristic calling card. Fruit bat faeces is scattered all over the small coral stones that she had spent hours collecting at the beach and had only recently laid down. Now breakfast was going to be an hour late as she would have to spend time cleaning up the mess.

Later that day, Mariyam receives another shock when she travels the long distance to her family’s field to harvest the weekly supply of taro. Water hens have eaten their way into the base of a number of her plants and these have started to rot. All this means that she will have to spend more money on rice and flour at the local store, and now that her husband is dead this is something that she can ill-afford to do.

Atoll agriculture is notoriously difficult and is constrained by extremely infertile soils, limited water availability and other environmental factors. Islanders struggle to produce the vitamin-rich fruits and vegetables that are needed to supplement their daily diet of rice and tuna fish. It is a long, hard battle when these problems are further compounded by the daily marauding of rats, fruit bats and water hens. The isolated and scattered nature of the islands has changed these animals into major pests affecting agricultural crops. They have no natural predators and have been causing havoc ever since their arrival.

There seems to be no crop that escapes attack by these pests. Fruit bats mainly cause damage and losses to fruit in the home garden. They like to eat the fruits of guava, mango, stone apple jam trees and
papaya. Rats cause serious losses to crops all over the island. They attack the large plantings of coconut that exist on inhabited and uninhabited islands. They also feed on coconuts in home gardens. In the small field plots of cereals that are scattered all over the islands they can cause total loss of the crop overnight.

Water hens are too frightened to come into the villages. Maybe it has something to do with the fact that the villagers are not averse to catching them and cooking them in one of their delicious curries. The water hens prefer to stay well hidden between the aquatic plants of the swamp areas but occasionally venture out to nibble on taro plants or watermelons if there is a field nearby.

In the long battle with vertebrate pests, the islanders have devised many ingenious methods to limit the damage they cause. When rat populations become so high that they cause extensive losses of coconuts, fruits and cereals, the island community organises itself into large-scale hunts. Men would scramble up coconut trees in an attempt to dislodge the rats while others waited below with large sticks to beat them to death. Such activities were common on Fridays, the usual day for community-type work.

Well organised hunts can effectively reduce rat numbers and are more reliable than the government-initiated poison/baiting programmes that never seem to be followed through to the end. At other times, when rat populations are relatively low, a selection of control measures, such as those listed in the box, can be used to minimise damage by rats.

Many barrier, trapping and scaring devices have been invented to minimise the damage caused by fruit bats (see box). Visitors to these islands shouldn't be alarmed if they see someone standing like a sentinel in the top of a tall mango tree. It is most probably a scarecrow. On the other hand, they may think that the many fishing rods, complete with line and hook, protruding from a wax apple tree, are point at some strange fishing place. This is, however, just another method that farmers have devised to trap fruit bats and minimise the damage that they cause.

Likewise, one should not be alarmed when one is awoken by the loud banging of tin cans in the middle of the night. It is only one of the villagers who has woken up to pull on the rope that lies beside his bed that is attached to a scaring device in a nearby fruit tree.

Unfortunately, since the death of her husband, Mariyam has not been able to maintain the nets and scaring devices that are needed for minimising vertebrate pest damage in her garden or fields. She does not have the time to climb trees and collect the materials to make traps. She has her work cut out cooking, washing, finding firewood, collecting her children from school and helping them with their homework. Last night, however, a lot of damage was done and she knows that she will have to hire someone to band the trees and put up nets.

In earlier times she could have given a few bananas in return for this service, but now the few men left behind on the island who aren't working in the nearby resorts, want money. On her way back from the jungle, after collecting firewood, Mariyam quietly wonders what food items or other little luxuries she can forego in order to afford the cost of protecting her home garden. As night begins to fall she is overtaken by the dusk procession of fruit bats on their way to the village for another night's feasting and she thinks that little bit harder.

The indigenous knowledge of pest control that local communities have accumulated over many years represents a valuable resource. It is important that scientists and governments recognise these innovations and work closely with farmers and communities in devising more appropriate pest management programmes. Such a dialogue would be much supported by an official pest management policy that acknowledges the importance of indigenous knowledge.
Indigenous methods of invertebrate pest control in the Maldives

Rats

- Tree trunks are occasionally banded using pandanus leaves wrapped tightly around the trunk. Coconut palm leaves, split lengthways along the midrib are also employed. One set of split leaflets is wrapped around the trunk below the crown while the other is wrapped in the opposite direction forming an effective barrier to climbing rats. These methods are now largely replaced by tin sheet banding.
- Stone traps consisting of a large flat piece of coral stone are delicately balanced over a bait of coconut or dried fish. The rat is trapped when it triggers a tripwire made from the fibres of sea hibiscus.
- Stick traps, made from locally available timber, are used on islands where large flat coral stones are uncommon.
- Trenches are dug around plots and one side is lined with woven palm leaves. Rats trying to jump the trench hit the woven leaves and fall into the trench.
- To protect ripening ears of maize from rat attack some farmers wrap them in long maize plant leaves. Other farmers take the added precaution of initially covering the ear with breadfruit leaves prior to wrapping in maize leaves. Apparently, rats do not like to nibble through breadfruit leaves.
- People are organised into large community groups for the purpose of hunting and killing rats. Some will climb coconut trees and scare out the rats while people on the ground will kill them with long poles. Rewards in the form of coconuts were given by the island office on presentation of rat tails.
- In the past, when grain was plentiful, it was common to store it in large granaries located in shallow water in the lagoon. This prevented rats and other pests from attacking the stores.

Fruit bats

- Ripening fruits are protected by placing them between empty coconut shells.
- Old fishing nets are placed over fruit trees keeping fruit bats from getting access to fruit.
- Fishing nets are strung up between trees to trap bats in flight.
- Fishing lines with numerous dangling hooks are strung up around home gardens in order to snare bats.
- Long poles, with fishing lines and hooks, are hung in fruit trees so that the hooks dangle at the periphery of the tree.
- Human effigies are placed in fruit trees scaring off bats.
- Scaring devices, made from tin cans, are hung in trees and are pulled at regular intervals during the night.
- Oil lamps are sometimes burnt in trees to ward off fruit bats.
- Cloth bags are used to cover and protect ripening fruit.

Water hens

- Scarecrows or human effigies are placed in taro fields.
- Snare traps are constructed existing of poles from local trees and fishing line.
• Watermelons are buried in holes and covered with old leaves to hide them from water hens.