Photo by Ania Wasilewski

Dr Mohamad Bin Muid: Helping to build a subsistence industry and research base.

THE TASTE OF COFFEE, COCONUT AND FRUIT

ANIA WASILEWSKI

Sitas Sarto stands beside one of 35 square wooden boxes on his 1-acre coconut/cocoa plantation in Tanjung Karang, Western Malaysia and laughs. Within the past six months his newly established bee colonies have produced about 3 kilos of honey each and his income has increased by about 25 percent. His house has been improved with new wood planks and his children have new clothes.

The agricultural extension worker responsible for the area, Mohamed Tohid, stands beside Sarto, amazed. He cannot understand why Sarto's hives have been so successful and his own, only a few kilometres away have not. Dr Mohamad Bin Muid, IDRC project leader for the Malaysian beekeeping project, explains that it could be a combination of factors including the design of the hive, the number of hives in the area, and genetics — whether the local bees are naturally low or high honey producers.

Although honeybees are native to the Indo-Malayan region, only India and more recently Sri Lanka (with CIDA assistance) have modern beekeeping industries. The collection of honey from wild bees is traditional in Malaysia where colonies are found in coconut trunks, rafters of houses, rusted old tins in yards and sometimes even in outhouses.

HIVES IN COCONUT TRUNKS

The IDRC project began two years ago when Dr Makhdzir Mardan of the University Pertanian Malaysia (UPM) noticed that people in the Muar district had captured wild colonies of *Apis cerana* with their hands and were keeping hives in coconut trunks "with no frames and with all the combs hanging down from the top piece". In modern beekeeping the honey comb is formed on a square wooden frame with two wires spread across to maximize honey production. The local people had been gathering the honey and earning some extra money by selling it. Demand for honey has always been high in Malaysia; in fact Malaysia has imported between 340 000 and 473 000 kilograms of honey per year for the last nine years and the amount is increasing. Most of the honey comes from Australia, China and California.

Mardan did some research and discovered that European bees had been imported several times to Malaysia in an effort to establish commercial beekeeping, but they had always died out. Mardan decided to concentrate on the local indigenous honeybee — *Apis cerena* — which unlike the giant honeybee — *Apis dorsata* — can be hived.

With IDRC's assistance, a four-year research and development program was begun, based at UPM, near Kuala Lumpur. The project is unusual in that it has successfully combined the development of beekeeping as a subsistence industry for small-holders of coconut plantations with the development of an apiculture research base by academics and scientists from various Malaysian institutions *and* is progressing simultaneously on both fronts.

The eight researchers are working in six different areas — bee management, bee botany, bee nutrition and honey analysis, pests and diseases of honeybees, research on *Apis dorsata* and the provision of practical information to small farmers. The project is also examining beekeeping in rubber plantations; Malaysia is the world's largest producer of rubber and of oil palm. However the nectar flows for only two months of the year in rubber areas so researchers are looking at migratory beekeeping, perhaps in rotation with rambutan, durian and other fruit crops. Very little is known about pests and diseases of bees under rubber — the problems are quite different from those in coconut areas.

BEE CALENDAR COMPLETED

Half-way into the project the researchers have completed a bee calendar detailing the activities of the *Apis cerana* throughout the year and thus establishing a procedure for bee management (when to feed the colony sugar-syrup because of reduced nectar flow during the dry season, at what

time of year swarming is likely to occur and how to avoid it, when to harvest and when to check for mites and pests), and are now developing a pollen atlas.

They have also designed a basic standard wooden beekeeper's box suitable for the humid Malaysian climate. Since March, Muid has been experimenting with supers, frames which are placed on top of the brood box and are filled only with honey, a more efficient and time-saving process for collecting and separating brood and honey. The problem is to determine when and if the bees will move up from the brood-frames to the super-frames, this being dependent on the available nectar and the number of frames.

The researchers are also developing stronger strains of bees by breeding and grafting queen-bees from stock which is highly productive. They are developing local quality standards for honey — in Malaysia darker, slightly fermented honey is more popular but after six months on the shelf it goes sour. So researchers are working on a thicker honey with less water content and less yeast.

QUEEN-GATE: A SIMPLE IDEA

The biggest pest problem faced by beekeepers is the wax-moth, but according to Muid, this is mainly a management problem. "We ask the farmers to check hives regularly and destroy combs with moths and bits and pieces of wax on the floor because this is where the wax-moth breeds." The queen-gate, a small piece of wire mesh, which is used to prevent the queen bee from absconding (leaving the hive for a new one and taking all the bees with her) also serves as an obstacle to keep wasps out. "It's a simple idea," said Muid, "but it was hard to come by." Until last year, 6 out of 16 colonies in one area were lost due to absconding, now with the use of the queen-gate, the rate is 0.

The queen-gate is one of several innovations the Malays have picked up from the Central Bee Research Institute in Pocina, India. In the past two years, six extension workers and laboratory assistants were sent to India for courses on queen-rearing and basic bee management. In Malaysia itself almost 200 farmers and extension workers have attended three- to four-day training sessions at UPM where they learned how to catch a wild colony, the different types of bees, the functions of workers, queens and drones, what equipment to use and how to make it, how to extract honey and month-by-month management of the hives.

Most of the farmers involved own small, one- to three-hectare coconut/cocoa or coconut/coffee plantations and have about a Grade 6 education. Muid is awed by "the ingenuity of the farmers — they use coconut husks or burning rope for smokers, and old nail boxes from China for hive boxes."

The farmers and extension workers come from all over Malaysia to attend the course, and when they return home they teach their neighbours what they learned. Sarto became interested in beekeeping when he "saw Tohid building all sorts of boxes." He then captured 15 colonies and transferred them into hive boxes "not knowing which were worker bees or queen bees", or even if there was a queen for every hive.

Photo by Ania Wasilewski

An experimental beekeeping box for Malaysia's humid climate.

Farmers' ingenuity: "They use coconut husks or burning rope for smokers and old nail boxes from China for hive boxes."

Muid said, "The project is really mushrooming, at a rate I can only estimate, we can't keep records it's expanding so fast and we don't know how many benefit from the training." In the area we have just visited there are now 14 small-holders keeping bees, only five of whom were originally trained at UPM courses. But the enthusiasm of the farmers and their desire to participate has created certain problems. The demand for courses is much more than the project can handle and if the farmers do not receive adequate basic training in bee management or advice when pest problems, swarming and dearth periods arise, they will not succeed in producing honey.

"Often the enthusiasm of the farmer exceeds the advice of the extension officer and myself," said Muid. The farmers overstock the hives, use the supplementary diet continuously instead of only in the dearth periods and sometimes believe that frames are unnecessary. "But they're learning the hard way — through experience," said Muid. He tries to visit as many of the farmers as he can and dispenses queen-gates and advice but he said, "We can't keep up this momentum because there are only three people involved in follow-up work, only three who know what they're talking about.

BEE RESEARCH INSTITUTE NEEDED

"What we need is a centre for beekeeping, to get researchers such as botanists and food scientists, not university lecturers, but people who are free from other duties. Call it a beekeeping research institute on par with the Rubber Research Institute. I'm able to come out this week only because I'm not teaching. Now that people are actually earning money from this, perhaps we'll get more government support, more courses, more personnel."

An advanced training course is planned to enable 25 extension officers and farmers who have already taken the basic course to teach it to interested farmers. "My hope is that they have enough experience at this stage," said Muid, "so that they can take over this load." He added, "Later in July when we form the Beekeepers Association of Malaysia maybe we'll get a more accurate idea of how many people are involved in beekeeping."

Even enthusiasts like Muid predict that honey from *Apis cerana* will never completely replace imported honey. Malaysians prefer the local honey which sells for $12 Malaysian "because it tastes like coconut and coffee and fruits" to Australian honey which sells for only $3½ Malaysian but "tastes of eucalyptus trees." Honey from the *Apis cerana* is also widely believed to have medicinal qualities and, according to Muid, "never reaches the shelf because it is always reserved by customers beforehand."

IT'S LIKE FISHING

The farmers say that beekeeping, besides, "moderately" increasing their income, is very satisfying. "It's like fishing," said Sarto. "You can relax and and observe them, even if you don't get any honey."

Muid said the more experience the farmers have the more successful they will be in producing honey but they must have the appropriate technical support. Most farmers have about three hives but want to have 30 if they can. The potential is there — abundant outlay, vigorous local participation and expanding academic research. Muid likes to repeat what Peter Kevan, an apiculturist from the University of Guelph, who visited last year, told him about the prospects for beekeeping in Malaysia: "It will soon go out of control like a forest fire!" □

Ania Wasilewski is a freelance writer. She visited IDRC's project while she was in Malaysia.