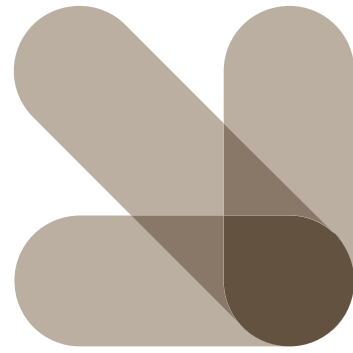




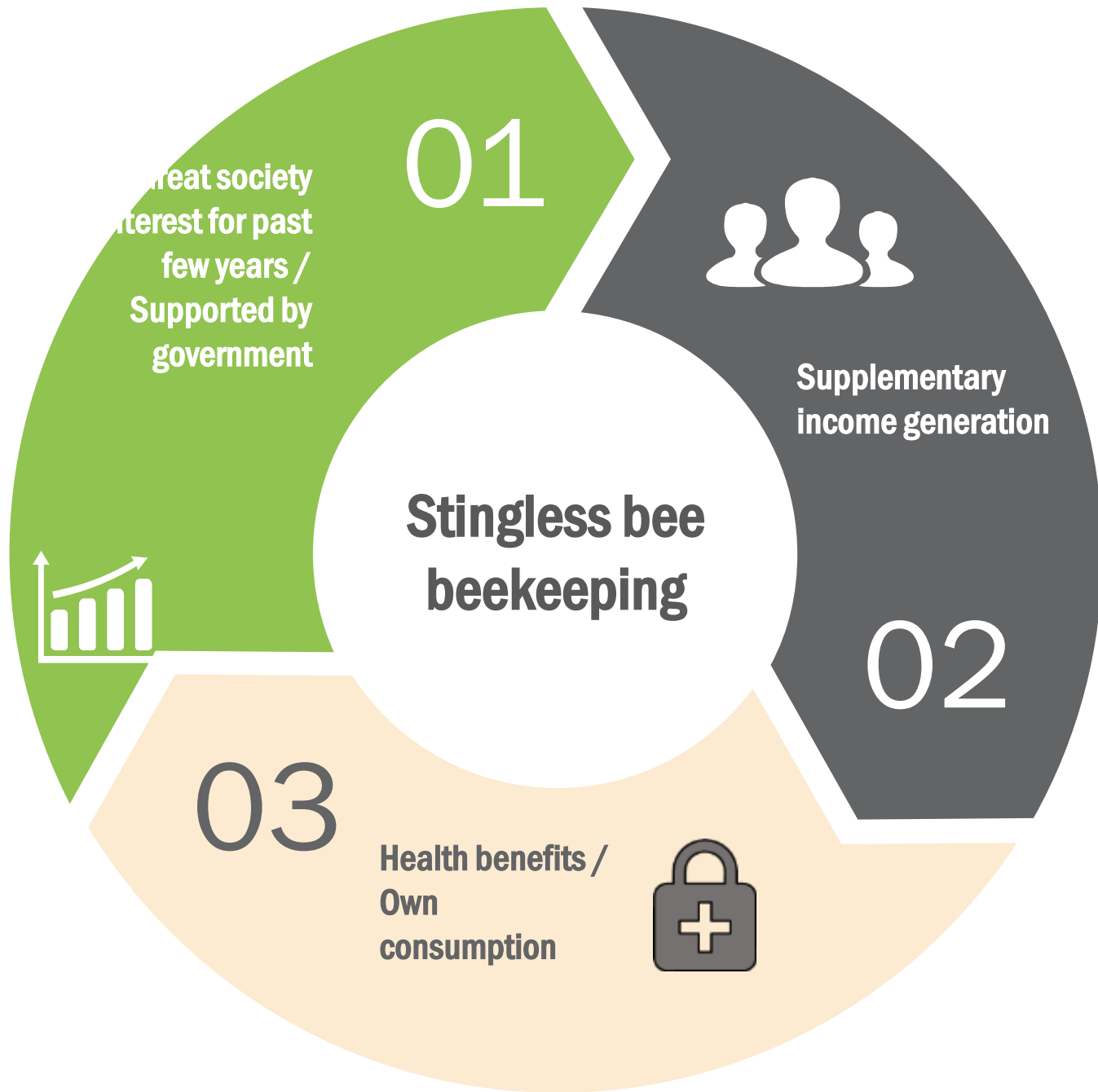
HOUSE YARD BEEKEEPING WITH STINGLESS BEE (*HETEROTRIGONA ITAMA*)

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INTRODUCTION





MELIPONICULTURE



Meliponiculture business supported by government



- Industry
- Community
Youths
Housewives

<http://giantb.com.my/en/stingless-bee>



Suitable
for rearing
in house
yard



Lacking of
functional stinger



Queen can live for
several years



Colonies relatively
easy to manage

Heterotrigona itama

- Common stingless bee species found in Southeast Asia
- One of the most suitable species for rearing in tropical wet, humid and hot condition



Justification

- An activity that attracts the public
- However, many new beekeepers have failed in business or bee farming due to several factors mentioned below;
 - Lack of beekeeping knowledge,
 - Lack of knowledge in pest attacks handling,
 - Lack of knowledge on bee habitats requirement,
 - Lack of early planning and materials preparation for beekeeping





AIM OF STUDIES

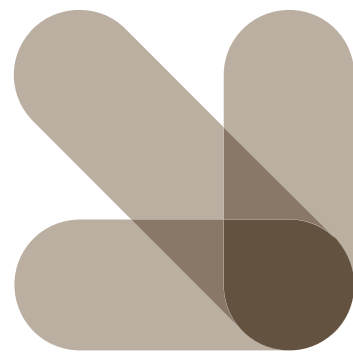
- Can we do beekeeping in house yard? Eg. Taman?
- Will they survive?

1) Hives distances & nest development

2) Foraging pattern and hives distances

3) Honey production rate per month (healthy colonies)

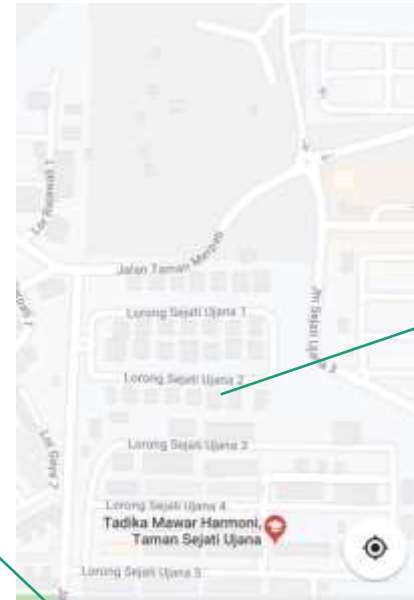
4) How to maintain healthy colonies



MATERIALS & METHODS

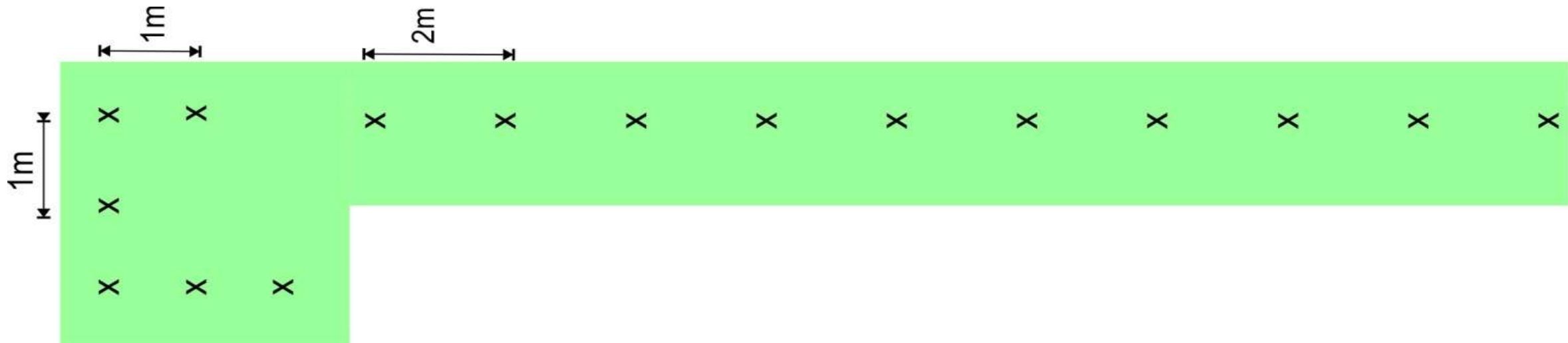


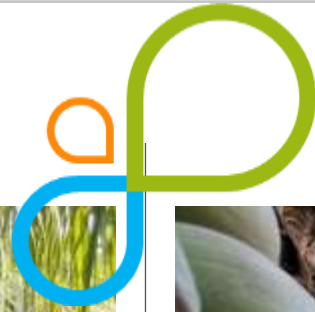
Location of
Study Site



Rearing of stingless bee > 2 years (September 2016 – June 2019)

Hives layout & development of nests





Foraging distances & pattern

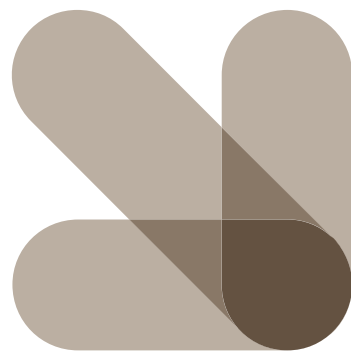
- To confirm beekeeping activity was only conducted in Lot X, Taman Sejati Ujana, Mile 7, Sandakan, observation on florals observation were carried out in all residential areas around 1-2km radius (straight line measurement from Google map)
- To investigate foraging pattern, observation was carried out from 6am to 6:30pm for 12 days observation
- Counting of bee individuals carried out only for those going out from hive entrance
- Temperature and RH measured using HOBObata logger (6:30am – 6:30pm for 12 days)





Harvesting of honey recorded for 5 months

— only active colonies were harvested for honey production
after 3 months of rearing



FINDINGS





1) Hives distances & nests development

-
- This study found that nests development were largely dependent on the strength of the bee colonies since bought and not due to close distances between hives.
 - Importance to choose only healthy colonies and mature natural hives

NEST DEVELOPMENT OF ACTIVE COLONY

**Nest development
after 2 months**



**Nest development
after 3 months**



**Nest development
after 5 months**



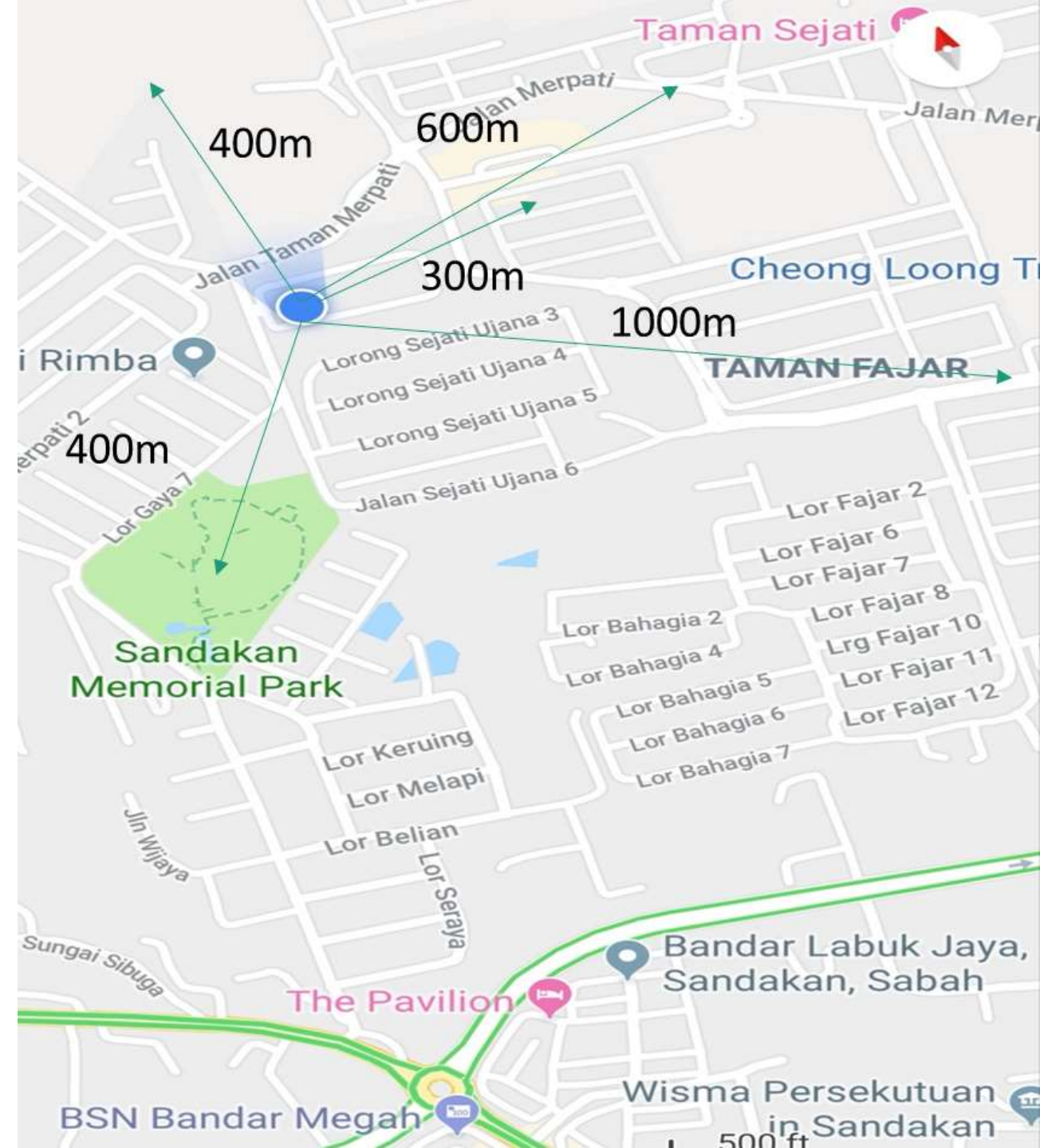
SLOW DEVELOPMENT COLONIES

Nest development after 5 months



2) Foraging distances and pattern

- This study observed that *H. itama* regularly foraged for nectar, resin and pollen at around 1km radius.
- The maximum distance (straight line) foraged by this species was 1.5km
- This species can fly at a height of 10m above ground level.
- They often visit plants; wild flowers such as senduduk, AMP, *Macaranga* spp, landscape trees, coconut flowers, mango trees, tapioca (leaves stalks), banana flowers, jack fruit trees (tree barks), banana trees etc.





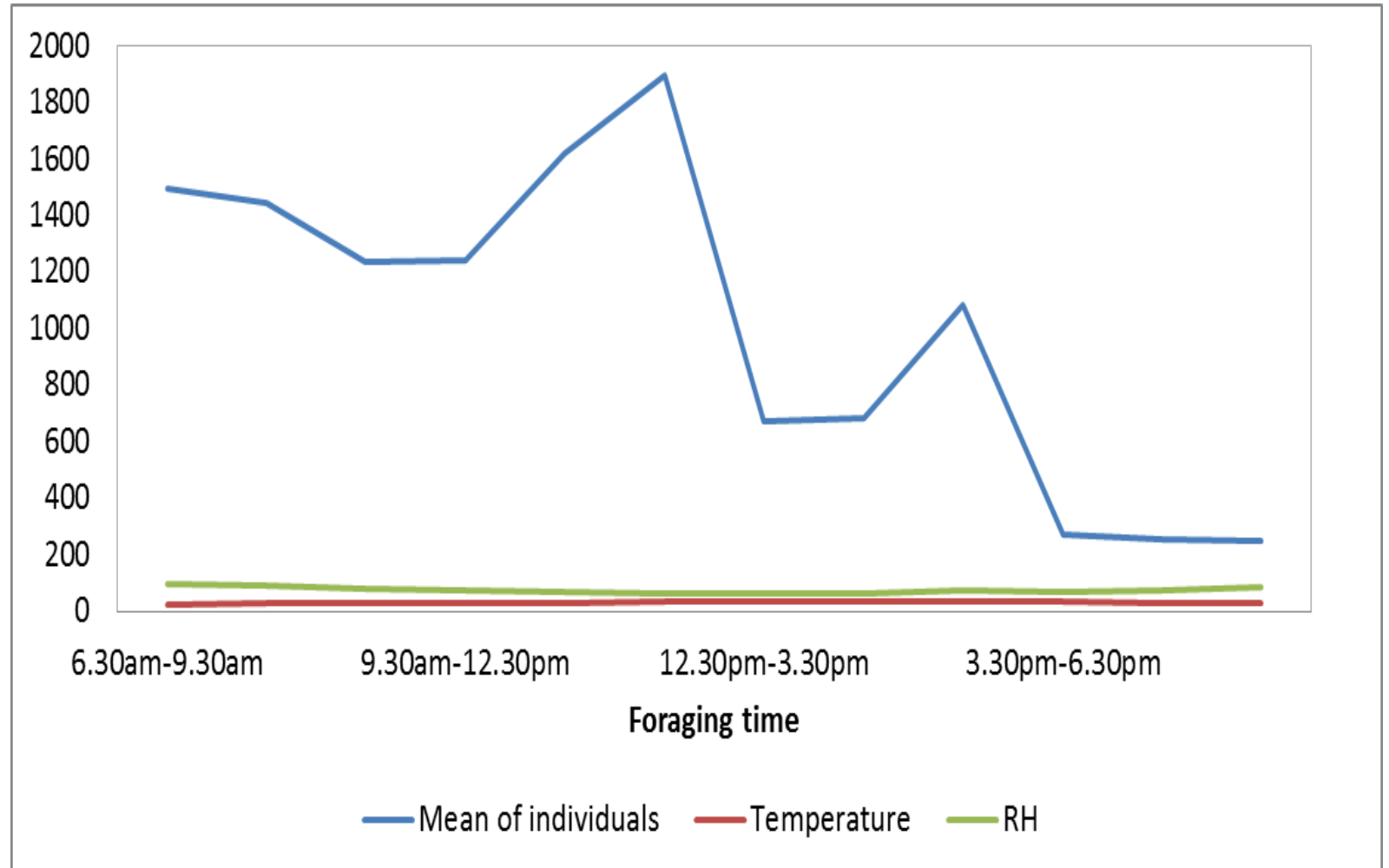


Areas visited by
H. itama



Foraging pattern

- The number of bees exploiting the food sources gradually increased again from 6:30am until 12:30 pm before cessation from 15:30 pm until dusk (6:30pm).
- *H. itama* foraging time in the residential area was not correlated to temperature (Pearson's Correlation: $r_p = -0.14$, $N = 12$, $p = 0.66$) and relative humidity (Pearson's Correlation: $r_p = -0.12$, $N = 12$, $p = 0.72$) condition in an environment.
- Bees avoid foraging during rainy days

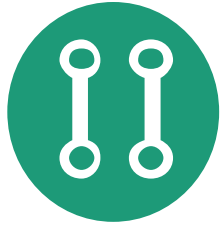


About two weeks of observations

3) Honey production rate per month (after 3 months of rearing)

Date	Total Honey (ml)		Remarks
	Distances between hives		
	1m (6 hives – 3 active colonies)	1.5m – 2m (9 hives – 6 active colonies)	
January 2017	300ml	600ml	It is advisable that the harvesting of honey is not done too often to prevent the bee colonies from being stressed.
February 2017	300ml	600ml	
March 2017	Stop	Stop	
April 2017	500ml	1000ml	
Mei 2017	800ml	1200ml	
June 2017	Stop	Stop	No harvesting conducted
July 2017	1000ml	1400ml	
Average monthly/ active hives	580ml/3 active hives	960ml/6 active hives	<i>Only applicable to active colonies and 20% of honey pot will be left unharvested</i>
TOTAL (5 months)	2.9L	4.8L	

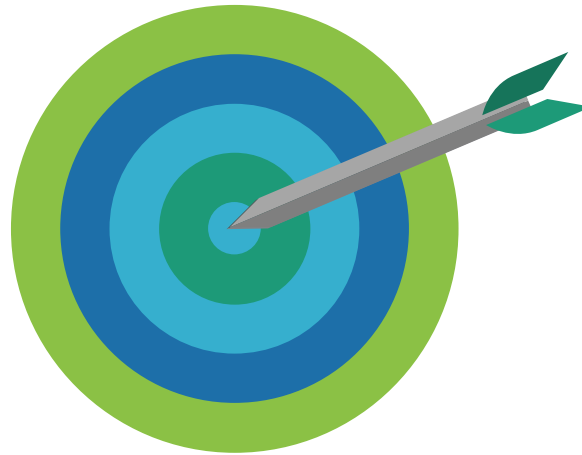
4) How to maintain healthy colony



HIVE DISTANCE & PLACEMENT



HIVE DESIGN



COLONIES MAINTENANCE



PEST & DISEASE CONTROLS



a. HIVE DISTANCES & PLACEMENT

- Early planning prior to placing of hive is crucial.
- Materials for beekeeping activity must be prepared before putting out the natural hive.
- Example; wood as pillar, artificial box ('topping'), wooden roof, plastic, wood adhesive etc.
- Plants can be put in between the hives to prevent colonies fighting due to swarming or when harvesting of honey.

b. HIVE DESIGN

- Design of artificial hive that could prevent intrusion of rain water and able to withstand severe hot and humid conditions are important.
- Placed hives under tree canopy or in shade
- Roof design should protect the nest in the artificial & natural hives and it can be overlaid with aluminium piece or rubber mats



c. COLONIES MANAGEMENT

- Indication of healthy colonies
 - Hive entrance (active bee individuals guarding the entrance and foraging activity) (> 50 – 100 individuals)
 - Sticky and well-formed hive entrance



Species that are not recommended for beekeeping in residential areas

- *Tetragonula* spp (eg. *T. laeviceps*)
 - This species often disturbed and colonized well established nest of *H. itama*
- *Lepidotrigona* spp (eg. *L. terminata*, *L. doipaensis* etc.)
 - These species not suitable for rearing in residential areas because they have specific habitats requirement (eg. microclimatic condition, limited flight distance movement, less mobile etc.)



d. PEST & DISEASE CONTROLS

- Hive should be at least 40cm – 50cm off the ground to avoid pests attack (ground creeping and crawling pests such as ants, lizard, etc.)
- Advisable to put grease at the wood / metal pillar
- Natural and artificial nest should always be kept dry at all times to avoid pest attacks (flying pest)
- Wet hives (natural / artificial) may attract flying pests such as BSF and carpenter bees
- Keep beekeeping area clean & tidy



ADDITIONAL TECHNIQUE

To accelerate the colonies build up;

- **Relocation of hive entrance**
- Addition of artificial hive levels

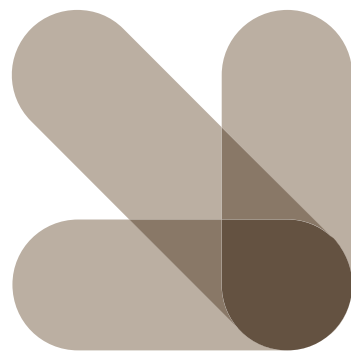
Could increase about 5 % of honey production

Can only be done for active colonies but slow in building nest in the artificial hive or 'topping'



Two layers of artificial hives ('double topping')





CONCLUSION





6. An excellent pollinating agent

6. An excellent
pollinating agent





This study concludes that meliponiculture (*H. itama*) is particularly suitable for those who wish to practise beekeeping in the house yard in residential area (urban area);

1. No sting that can attack neighbours
2. Can be reared at close distance (1-2m apart)
3. The species is easily adapted to the environmental condition in the residential area



4. Species able to fly at height of 10m, past the home fence and fly long distance at a radius of 1-1.5km to forage for food and resin sources
5. Species produce honey at a fairly good rate (> 1 L per month – 9 hives) if colonies are stronger and stable
6. Additional income or Own consumption
(1540 ml / 9 active hives / monthly = **RM539.00**) or RM35/100ml

THANK YOU

