

EFFECTS OF TRADITIONAL AND SUSTAINABLE BEEKEEPING TECHNOLOGY ON HONEY, BEES AND HUMANS IN NIGERIA

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ABSTRACT

This presentation is a comparative study that unveils the traditional beekeeping practices in Nigeria and compares it with the sustainable practices, revealing their effects on the produced bee products (e.g. honey), bees themselves and humans that manage the bees and use the products. Beekeeping in Nigeria is presently dominated by traditional beekeepers and honey hunters which lack the real tool to work in beekeeping field (untapped gold mine) in the country, Honey produced by this group of people results in poor yield and low quality. The worst of all is that this technology leads to massive murder or destruction where bees of all ages and the honey are killed. What will then happen to the human beings that consumes the dead products? This among other things call for organic beekeeping practices which leads to sustainable beekeeping

Key words: *Tradition, Sustainable, Honey, Honeybees, Nigeria.*

BACKGROUND OF BEEKEEPING IN NIGERIA

From time immemorial, man has reaped the benefits of bees. In Nigeria, the activities revolving round bees are dominated by active rural dwellers and hunters. Infact, ***traditionally bees are not kept or reared in Nigeria prior to modernization.*** The initial traditional bees' activities in Nigeria which still prevail involve the honey hunters in remote areas of the country plundering wild nest of honeybees to obtain honey crops for consumption and income generation.

There is no record of attempt by farmers to rear bees in the Southern Nigeria although they harvest the honey stored up by wild bees. Efforts by farmers in the North to rear bees were noticeable in the early 1920s. Therefore, an early article (written in 1927) claims that Zaria people who make up today's Kaduna State were probably the origin of beekeeping in Nigeria. There was no scientific approach to beekeeping by this pioneers. All they did was to provide woven straw (skep), baskets or clay pots which they hung up in trees. The trees were mostly flowering trees of the legume family. The hives sometimes did not last more than one season. More often than not, they were blown down by wind. Where the hives remained undamaged, the bees were burnt off before harvesting the honey.

As early as 1941, modernization brought in ***new ideas*** into bees activities which includes but not limited to: ***processing empty combs into beeswax, rearing honeybees in a moveable-comb hive and proper management of the bees in the hive (modern beekeeping)***. From this note, Ikediobi, Obi and Acheba, (1985) defined beekeeping as the art of rearing, breeding and managing honeybees colony in artificial hive such as Local and modern beehives for economic gains. At present, only few people in Nigeria have welcomed these new idea and can keep bees in different types of hives which includes Skep (as in Northern Nigeria), Clay pot (mostly in the Southern Nigeria), raffia and wooden (different parts). The local hives are hung on trees with or without baiting to attract swarms issued out by wild honeybees, as practiced in some villages such as Nsukka, Obudu, Ijabu, Tiv etc. The indigenous regarded bee in Nigeria is tropical African honeybee – *Apis mellifera adansonii*.

Categorically, I would like to rate the three major kinds of bees and beekeeping activities in Nigeria as follows:



POTENTIALS AND FUTURE OF BEEKEEPING IN NIGERIA

Beekeeping (Apiculture) is an applied science of rearing honeybees for man's economic benefits (Nwali Lawrence 1999). According to Obi Victor Jr. (2000). It is the practice of honey-bee rearing which combines the knowledge of the biology and behaviour of bees with that of the surrounding environment and the use of suitable equipment to produce honey and other bee-hive products for the benefits of man.

In Nigeria, it represents a major untapped natural resource; hence there was no past record of any scientific approach by farmers to rear bees.

There is "gold" in the tropical rain forest of Nigeria but it is liquid gold, not solid, you don't dig for it –you hunt and develop it [Ekpo, 2008]. At least that is what the local honey

hunter do but they do not do it in a modern and sustainable manner. ***Nigeria has the potential of improving her economy and contributing in the world economy through apiculture considering the excellent climatic condition coupled with array of rich vegetation – cultivated and wild across the nation, which provide abundant raw materials needed by the industry.*** Although, there may be threat due to some traditional agricultural practices already in existence such as deforestation (for timber, urbanization etc), apiculture ensures ***forest sustainability and regeneration.*** Furthermore, it increases crop yield through pollination by bees, conserve the environment, provides employment, less capital required, sustains the lives and wellbeing of the people especially in the rural areas among other things.

With the domestic consumption of honey growing, the future for beekeeping in Nigeria is bright. Because the cost of starting a bee farm is low compared with other areas. A trained beekeeper with three support staff should be able to run 1000 colonies of bees successfully (Anon, 1981). ***Therefore there is an urgent need to support and promote beekeeping projects in Nigeria considering the potentials that prevails in most developing countries.***

BEES AND BEEKEEPING MISCONCEPTIONS IN NIGERIA

Misconception is a belief or an idea that is not based on correct information, or that is not understood by people (Oxford Advanced Learner's Dictionary). It is paramount to understand the common misconceptions revolving round bees and beekeeping in Nigeria, because they may be the basis for the traditional beekeeping practices adopted in the nation which hampers the development of sustainable beekeeping practices. It varies from one locality to another depending on the interpretation given by the elders to a particular situation concerning bees and beekeeping.

Generally, the first thing that comes to the mind of a real Nigerian when he/she hears about bees is that **bees kill human beings**. In a further discussion, he will give an instance of one or place where bee stung one to death. In Igbo land (South-East), particularly Enugu state, when there is a passing swarm of bees the elders usually get worried that, it is a bad "Omen". The elders

usually say **“KA OCHIM KAKWA AKWAM TAA”** which may be translated in English language as **“let my laughter be greater than my out cry today”**.

According to a Yoruba man, Mr. Bakara Oseref from Ibadan, Ondo State (South West) on oral interview said that a cluster of bees in a compound at his place in a residential home signifies that one’s father or mother or any of the in-mates may fall sick or die. He went further to say that someone may travel away to distant places and encounter a bee sting, he/she may decide to go home to find out what has happened at home; adding that it is a sign of mother or father’s illness or death.

In Akwa – Ibom State of Nigeria, they believe that a cluster or sting of bees are bad “Omen” and when bees cluster in a forest, it is a “Taboo” and such forest belongs to “Juju” or shrine. More so, when they see a passing swarm, they believe that it is coming to cluster on them, and as a result, they either bend down or decides not to make any noise so that the bees may not see them.

Notwithstanding, the recent scientific beekeeping practices in Nigeria, it has not been possible to convince some elders in the rural areas that bees could be reared and managed.

There is always the fear that bees are harmful to man. But gradually more people are becoming interested in keeping bees. More so, with the help of teachings and learning from books written by European Authors and Federal college of Agriculture Umudike, students are trained. Bee hives are seen placed both at Western and Eastern farms for Harvesting and Research work. Scientists are making effort to prove to elders that bees could be managed and cared to produce honey and other bee products.

A. TRADITIONAL BEEKEEPING TECHNIQUES IN NIGERIA – HONEY HUNTING:

Tradition is a belief custom or way of doing something among a particular group of people, that has existed for a long time (Oxford Advanced learner's dictionary, pg. 1271). As I have mentioned already, traditionally, honeybees are not kept or reared in Nigeria rather than ***an insect that people are afraid of generally; but its product - honey liked by many people.***

Some people also believed in Nigeria that a swarm of honeybees temporally clustered on ones building or near a living home is an Omen or that they were sent by ones enemy to kill him. Therefore a native doctor should be consulted to know why the bees cluster near somebody's home.

The issue to address in this presentation include how Nigerians treats the honeybees on the course or process of trying to get their honey, what happen to the honey crop after being harvested or snashed out of the bees and what is the after math of the harvested honey crop when consumed or used as an ingredient for the production of consumable products.

TRADITIONAL BEE HIVE AND HONEY HARVESTING

In Nigeria, honeybees are known to live in hollow trees inside forest naturally. Honey harvesting is done in the night and one waits till when the moon will be completely round because it is believed that it is the only period one can get honey in the combs, other than this period everything in the hive will be broods or empty combs (what sustains the colony?). The local hives like clay pots are used to keep bees (e.g. Nsukka in Enugu State), the harvesting is still at the same period preferably during dry season. It is believed that if one goes to harvest honey from the pot during rainy season and sees his/her shadow on the water that collected inside the pot, the person will die.

Equipment to be used during the night honey harvesting include, sharp cutlass, sharp axe, well dried grasses, light source (like matches, lighter etc) honey collection basin, ladder (incase the tree is tall). Thick cloth to cover oneself, etc. in some areas poisonous chemicals such as *sniper* will be included in place of light source for killing the innocent honeybees.

During **honey harvesting** proper, a well dried grasses will be heavily tied together and lighted after dressing very well. With the burning grass, the bees will be totally killed, the entrance cut wider so that ones hand can enter easily and the honey harvested by drawing out the combs from the tree hollow. By so doing both the broods and the honey will mix together. Not only that it mixes with the broods, the fire intensity used for this operation is very high that it sometime affect the honey by killing the enzyme (invertase) in honey.

Where chemical is to be used, some pieces of cock feather are tied at the pointed extreme of a long raffia stick, the feather is soaked in the chemical and positioned properly at the flight entrance of the bees.

This is left for 24 hours and after which all the bees will die, then the “poisonous” honey will be harvested. This they have done to some of our hived colonies and it was very terrible. (see pic).

Honey processing: It is believed that honey should not be tasted while harvesting, if so happened, bees will sting one to death. Therefore, after harvesting the honey combs (with broods), they are carried home for process where other members of the family and neighbour gather to have a taste of the honey. After given people, the main owner may decide to sale it with the comb where they carry it to the market for the purpose. Or if they want to process it, this is done by using hand to press out the honey from the comb and bottled directly in any available container (bottle). ***The combs are thrown away traditionally.*** In places where this practice is predominant like Nsukka village some women goes to the market specifically for honey pressing and they are being paid. After battling, the capping and other diets float and block the narrow of bottle, therefore it is also believed that “real” honey should be thick to the extent that it should not flow out from the bottle when turned up-side down. Are we talking of viscous liquid or a pure solid product?

Honey as well known has series of potentials ranging from nutritional industrial to therapeutic, most of them has a direct influence or effect on human life when consumed directly or used for the production of consumable products. A very big question here is, ***will burnt honey that is mixed up with broods and other diets still retain its potentials?*** A lot of Nigerians always complain that they consumed honey or used honey for one treatment or the other and it did not work as they were told during a seminar or workshop or written in some beekeeping books. The answer have lies on where is the source of the honey and how does the honey in question handled on the process of trying to collect it from the real owners (honey bees).

B. SUSTAINABLE BEEKEEPING TECHNIQUES

The concept of sustainability include judicious use of resources, resource conservation and enhancement of environmental quality.

Sustainable beekeeping is characterized by successful management of resources for beekeeping to satisfy present human needs without jeopardizing prospects of future generations by maintaining or enhancing quality of the environment and conserving natural resources. Resources in this context include all inputs ranging from natural and locally available materials to manufactured items from outside the beekeeping sector needed for beekeeping to be sustainable. Among many of them, the major ones here include – honeybees, environment, technology and the people.

Honeybees – At the heart of sustainable beekeeping is the welfare of honeybees: not just at the level of the individual colony or apiary, but at the level of the whole bee population of a particular region. This is because most people or beekeepers consider only those bees in their hive without considering the resources-base (wild bees). Therefore, the protection and maintenance of indigenous bees is the aim of sustainable beekeeping.

Environment – Environmental sustainability demands that ecosystems are not damaged beyond their capability to maintain their own biological processes, functions, biodiversity and natural

productivity such as supporting and sustaining its own bees.

People – The people within the beekeeping environment must have a positive attitude towards bees and not seeing them as enemies and should not come closer to human beings. For beekeeping to be sustainable the people must accept bees with good mind and see them as a means of improving their livelihood and sustaining their own lives.

Beekeeping Techniques: - Honeybees being natural creatures needs natural methods for effective management. Sustainable natural method for managing bees must be determined by ways the bees want to live. Consequently, there may be some conflict between what the bees required and what the beekeepers requires or the human's state of mind towards the bees.

To elaborate this, I would like to discuss the sustainable techniques under an established guide on how to start sustainable beekeeping outlined in my practical training manual.

1. Interest (personal)
2. Beekeeping awareness/sensitization/training

3. Raw materials availability
4. Honeybees housing
5. Colorization (stocking)
6. Beekeeping equipment
7. Field operations
8. Products processing and value added
9. Products certification (optional)
10. Products marketing

1. Interest – In this context, interest is one's willingness to accept something and it is on individual bases to avoid one saying that he was forced into it at the long run (personal). Sustainable beekeeping adopt the method of involving people that want to know more on how to handle bees thereby looking at the positive aspects of beekeeping and pay less attention to its negativity knowing that human beings are worst than the innocent gentle honeybees. Interest in beekeeping is different from need for bees' products (e.g. honey).

- 2. Beekeeping sensitization and training** – The interest is developed through eager to seek for knowledge on how to practice what one is interested in. Much time is spent here because a lot of new messages are passed using different methods and persons to ensure that the correct message is received. Different resource persons, familiar with the rural and social – economic conditions are involved. Local people are trained as trainers and beekeeping project conductors. People from implementation agencies should only act as facilitators. Furthermore, sustainable beekeeping considers that beekeepers, honey hunters and newcomers to beekeeping need different levels of sensitization and training.

- 3. Raw materials availability** – Sustainable beekeeping ensures that the beekeeping environment is naturally rich in terms of the basic raw materials (e.g. nectar, pollen and water sources). Where these raw materials are lacking or inadequate, more should be provided and deforestation discouraged for the good of the people and trees.

For sustainability of beekeeping, natural raw materials should be provided instead of artificial ones.

- 4. Honeybees housing (hive)** – Sustainable beekeeping advocates the use of cheap locally available materials accepted by the bees in a particular area to construct bee hives.
- 5. Bee hive colonization (stocking)** – This is the process of bringing honeybees into artificial hive made for them. (Please see above). This is done by attracting a swarm, colony division or queen bee breeding. Beekeepers are also encouraged to construct the simple hives themselves to reduce cost. The bee hives are installed where the beekeeping raw materials abound and where the bees like to live to guarantee high colonization. Unlike the traditional beekeeping techniques which plundering the wild nest of honeybees for their honey, sustainable beekeeping encourages bees to live in a man-made hives for easy manipulation.
- 6. Beekeeping Equipment** – Sustainable beekeeping integrates the rural micro industries in producing some

beekeeping equipment incase they cannot be produced by beekeepers themselves. Locally available materials and modern materials (if input costs permit this) liked by bees as well as the people are used for producing beekeeping equipment. For instance using white-Coloured cotton material for bee suits shows neatness and the bees perch on it instead of stinging people. Therefore training of carpenters, blacksmiths, tailors and potters is necessary.

- 7. Field operations** – Sustainable beekeeping calls for simple and easy to handle technology (e.g. during harvesting and processing) which will not adversely affect either the bees or their products. For instance, in honey harvesting, the bees are controlled using smoker and the honey gently harvested, unlike the traditional method of burning both the bees and their habitat.
- 8. Products processing and value added** – Sustainable beekeeping adopt processing methods which must not contaminate any bee product either directly or when it is used for the production of secondary product. For

instance using local processing equipment such as plastic bucket, table spoon, cotton strainer and plastic basket to extract honey from its combs is adopted.

9. Products certification (optional) – This is optional because for a beekeepers to pass through the rigors of satisfying their products (for instance honey), the scale of production of such beekeepers is paramount. Beekeeping can be sustainable in most rural areas of developing countries without any certificate for their products. Although sustainable beekeeping requires that products should be certified, but the people standard of living must be considered.

10. Products marketing – In sustainable beekeeping there is always a readily available market to absorb all the products produced at a particular point in time. Unlike the traditional methods which entail looking for a market that may not be regular.

Other Sustainable Agricultural Practices

Apart from the main beekeeping activities discussed, there are other agricultural practices which may hamper

beekeeping directly or indirectly if not practiced in a sustainable manner or way. Among these practices which include deforestation, indiscriminate bush burning and others, I would like to discuss **pest management as it affect beekeeping and its sustainable ways.**

The International Alliance for sustainable Agriculture defined **pest** as an organism (insect, mite, weed, fungus, disease etc) that humans which to control or eliminate for any of various reasons including possible harm to crops, animals and structures. Our concern here is the approach to control these pests without adversely affecting any of the bees' product, the bees themselves and humans. Therefore, integrated pest management (IPM) approach evolved as an alternative solution to escalating costs, health hazards, environmental pollution and disturbance of ecological balance arising from the use of chemical in pest control. In IMP, a combination of measures is recommended. This includes the use of botanicals (biopesticides) such as **neem extract**, sanitary measures such as using health and clean planting materials and clean tools; intercropping and cultural

practices, for example, manuring, mulching and manipulation of planting dates and spacing. Other measures include mechanical control measures like hand picking, creating noise to scare away pests (where necessary); biological control using natural enemies (cat to control rat) and storage practices.

The above techniques must be adopted to overcome the threat caused by chemical control of pests. For instance, Ole Hertz, in his article: Bees and pesticides, published by Bees for Development, UK stated "In 1981 OXFAM declared that 750,000 people were poisoned in one year from pesticides (especially insecticides). Half of these incidents and 75% of the people killed were in developing countries. Other statistics from the World Health Organization tell that one person dies from pesticide poisoning every minute in this part of the world". He concluded that the situation is even worse now.

SUMMARY

THE FATE OF HONEY, BEES AND HUMANS IN TRADITIONAL AND SUSTAINABLE TECHNIQUES

BEEKEEPING TECHNIQUES			
EFFECTS	Bees	Organic/Sustainable <ul style="list-style-type: none"> - Population increased rapidly - Their habitat maintained for continuity (environment) - Conserve and regenerate the resource base 	Traditional (honey hunting) <ul style="list-style-type: none"> - Population reduced drastically - habitat damaged for eternity - resource-base (wild bees) damaged
	Honey	<ul style="list-style-type: none"> -Organic or live honey produced -Yield (quality and quantity) increased. -Neat uncontaminated honey produce -Wholesome honey -Retains its natural potentials 	<ul style="list-style-type: none"> -Dead honey produced -Yield reduced -Contaminated honey (mixed with broods) -Poisoned honey (chemical harvesting) -Loose almost all the natural potentials in it
	Human	<ul style="list-style-type: none"> -Food security ensured for the increasing population -Use safe and wholesome product -Healthy living assure -Boost crop yield -Easy work (afternoon) 	<ul style="list-style-type: none"> -No food security for the people -Use unwholesome products -Death assured immediate or gradually -Crop yield is reduced -Tedious/hectic work (night duty)

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FIELD REPORTS FROM FARMS IN RURAL AREAS OF NIGERIA (EBONYI STATE)

**Table 2(a): Annual income generated from Honey sales
compared to other farm products/commodities**

Enterprise	Product/commodity sold	Income generated (N)			Total Amount (N)
		2006/ 2007	2008	2009 (Jan- April)	
Apiary: Wild Honeybees and locally Fabricated hives	Honey	210,250	398,600	123,100	731,950
Crops husbandry: Rainfed and Flood Irrigation adopted Water pumped from nearby stream	(a) Pineapple	397,124	53,315	3,794	454,234
	(b) Tomatoes	55,710	79,977	—	135,684
	(c) Plantain/Banana	11,750	54,031	20,690	86,471
	(d) Maize	—	312,640	24,450	367,140
	(e) Palm Kernel Oil	—	350,000	—	350,000
Animal husbandry: (Micro – livestock)	(a) Fresh Fish	193,354	422,032	305,380	923,766
	(b) Live Grasscutter	123,800	189,750	29,550	346,100
	(c) Live Snails	24,265	112,915	3,000	140,180
Source:	Umuebe Farms Ltd Izhia (2006 - 2009)				
Deduction:	From the above table				

- ❖ The highest total amount was realized from fresh fish (N923,766) followed by honey (N731,950)
- ❖ In reality, honey ranks the first because huge amount of money was spent on feeding and purchasing fish foundation stock
- ❖ The total amount realized from other farm products were lever than that of honey not with standing that much money was spent on inputs such as fertilizers, pesticides for crop husbandry and feeding for animal husbandry.
- ❖ For honey production, bees were attracted from the wild and not fed
- ❖ Much time was not spent on honey production because the bees were working for me unlike the crop and animal husbandry which require human presence at all time.

Table 2 (b): Monthly income generated from different farm products (August, 2009)

ENTERPRISE	FARM PRODUCTS SOLD	UNIT AMOUNT (N)	TOTAL AMOUNT (N)
Apiary	Honey	52,000	52,000
Crop Husbandry	(a) Banana	1,160	
	(b) Guova	4,040	
	(c) Coconut	660	
	(d) Plantain	990	
	(e) Orange	3,870	
	(f) Water leaf	60	
	(g) Telfera (Ugu)	270	
			11,050
Source: Umuebe Farms Ltd, Izhia (2009)			

Table 3: income realized from honey business in a rural area (January – march 2010).

PURCHASING DATE	PRICE OF HONEY COMBS (N)	AMOUNT FROM PURE HONEY ALONE (N)	DIFFERENT (N)
24/01/2010	16,675	28,000	11,325
27/01/2010	20,000	39,000	11,000
5/02/2010	59,000	115,000	56,000
13/02/2010	65,000	103,000	38,000
12/03/2010	55,000	102,000	47,000
20/03/2010	55,000	105,000	50,000
	270,675	492,000	221,325

Source: C and C Agric Ventures, Nigeria (2010)

NOTE: well ripped honey combs were bought from local beekeepers and honey hunters, processed and sold to individuals.

From the above table, 270, 675 was invested in the purchase and processing of honey combs. N492, 000 was realized from sale of pure honey a lone (not including bees wax). When the initial capital was deducted, a profit of N221,325 was available.

Transportation and other logistic expenses were included in the price of honey combs while the packaging expenses was covered from the sale of beeswax.

Table 4: income from honey by two part –time beekeepers in rural areas

DATE OF SALE	IDENTITY	LOCATION	HIVE TYPE	HONEY QUANTITY (N)	RATE/KG (N)	TOTAL AMOUNT (N)
6/02/2010	Book 1	Ntezi	Bar	6.5	800	5,200
25/02/2010	Book 1	Ntezi	Bar	6.0	800	4,800
7/05/2010	Book 1	Ntezi	Bar	15.5	800	12,400
						22,400
25/02/2010	Book 2	Ngbo	Bar	29	800	23,200
25/02/2010	Book 2	Ngbo	Bar	15.9	800	12,720
						35,920

Source: C and C Agric. Ventures, Nigeria. (2010)

According to BK 1, the money realized from honey sales was used to pay for his children school fees, cultivate other crops and bought other food items for family use.

According to BK 2, the money gotten from honey sales supported him much in roofing his house, pay for his children school fees, purchase of computer printer and buying other items for family use.

Generally both BK 1 and BK 2 accepted that their livelihood was really improved since they started keeping honeybees.