Bee products: providing nutrition and generating income - Honeybees, beekeeping and bee products in our daily lives

Collection of contributions received

Discussion No. 118 from 12 August to 1 September 2015
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31. Bee Life
Introduction to the topic

Honeybees provide a wide range of benefits to humans from honey, other bee products, pollination of food crops and ecological services. Beekeeping is practiced around the world, and can provide a valuable source of income to people in developing regions with relatively little investment.

The best known primary products of beekeeping are honey and wax, but pollen, propolis, royal jelly, venom, queens, bees and their larvae are also marketable primary bee products. Most of these products can be consumed as they are produced by the bees. There are additional uses where bee products are an ingredient of another product. Due to the quality and sometimes almost mystical reputation and characteristics of bee products, the addition to other products usually enhances the perceived value or quality of these secondary products. This can increase the profitability of many beekeeping operations.

The main bee products that are used for human consumption and use are:

- **Honey**
  Honey bees suck the nectar from flowers and store it in a stomach-like organ called a honey crop. When the bee returns to the colony, another bee takes the nectar and spreads it over the wax honey comb to help water evaporate. The second bee also adds enzyme called invertase to help break down the sugar molecules. Once it becomes thick it is sealed in a cell with a wax cap.

- **Pollen**
  Pollen grains are small, male reproduction units (gametophytes) formed in the anthers of the higher flowering plants.

- **Propolis**
  Propolis, or bee glue, is a mixture of beeswax and resins collected from leaf bugs and twigs. It is used to line nest cavities and brood combs, seal cracks and reduce the size of the hive entrance. Propolis has antibacterial and antifungal properties.

- **Royal jelly**
  Royal jelly is a protein rich substance that is fed to larvae. More is given to the queen larva, causing her to grow larger than the other bees. It is made from digested pollen and honey and contains sugars, fats, amino acids, vitamins, minerals and proteins.

- **Venom**
  Venom used in the bee sting is made up of a complex mixture of proteins. Recent research suggests that venom may have benefits to humans.

This notwithstanding apiculture faces a number of challenges that can impact on the health and survival of the colony. The main threats come from loss of habitat, pathogens, agro-chemicals, invasive species and climate change. Apiculture also faces challenges from competing with cheaper alternative ingredients, policy and legal support to beekeeping, to technical constraints/knowledge of beekeeping practice.

Some questions to help guide the discussion:

1. What are the dietary and nutritional benefits known in your community for bee products?

2. Is honey affordable and available in your community all year round?
3. What are the prospects for beekeeping in the future? Beekeeping, poverty alleviation and food security: where are we headed?

4. With diseases, pests, habitat loss, colony collapse and climatic changes increasingly affecting apiculture around the world, what can we do to create sustainable conditions for agriculture and apiculture to coexist and to benefit from each other?

We are looking forward to reading your responses. Thank you for your time and for sharing your knowledge and expertise!

James Edge, Communications specialist and 
FAO’s TECA Beekeeping Exchange Group
Contributions received

1. **Gary Burniske, Purdue University, United States of America**

Dear Colleagues:

In response to Discussion 118 on Bee Products – a new technology for bee hive management has been developed in Australia that is much less invasive for the extraction of honey. Information on the “Flow Hive” as well as ordering hives can be found at:

https://www.indiegogo.com/projects/flow-hive-honey-on-tap-directly-from-your-beehive

I don't know how widespread this information is – but it is worth exploring and perhaps piloting with small holder families in developing countries.

Cheers,

Gary R. Burniske
Managing Director
Center for Global Food Security
Discovery Park / Purdue University

2. **Michele Baron, Kyrgyzstan**

I would also like to pose a question for the forum on the resilience of bees, other pollinators, and beneficial insects--

while seed banks are useful, if our honey-producing bees, pollinators and beneficial insects are evolving along with the diverse and dynamic plant life and landrace seed crops adapting to survive outside the stasis of seed storage centers, what tests or verifications are being conducted to ensure that pollinators and beneficials will recognize, and possess digestive systems and processing enzymes necessary to make honey from these "seed bank" plants if they are returned to the biosphere after some decades of separation? Will a plant-generation or two of overcross with landrace crops be necessary for compatibility with then-current insect species?

Meanwhile, for health in the present, since some studies suggest as much as 75 percent of global seed diversity in staple food crops is held and actively used by small farmholders (many of them women) in peri-urban and remote rural locations, costs and deleterious effects of toxic chemicals used to control crop infestations may be avoided by bordering arable lands with early-season and late-season blooming plants, clumping grasses, and pollinator-friendly herb and medicinal plants can provide pollen (protein/food), nectar (carbohydrate/energy) and shelter not only for bees, but for lady bugs, lacewings, beneficial wasps, and other insects which are natural predators to insects which eat (or lay eggs/form larvae which eat) farm crops. Pairing tansy, marigold, basil, mountain mint, hyssop, borage, or other widely available varietals with garden crops can provide ample sustenance for bees and beneficials, enable predictable honey production (i.e., specific plant/source flavors, or safe gathering zones with ample water and plentiful pollinating plants throughout the
-growing season), and help make garden-food-production more secure, especially for small-holder farmers.

Additionally, farmers can gather and dry or process herbs, aromatics and floral border plants for use and sale at the end of the growing season.

3. **Chime Paden Wangdi, Tarayana Foundation, Bhutan**

We know processed sugar is bad for our health. However, during the winter months, many beekeepers keep sugar syrup for the bees in the absence of flowers, therefore nectar. What is the effect of this on the nutritive quality of the honey?

4. **Max Blanck, FAO, Italy**

Dear all,


Best regards,

Max

FSN Forum Moderator

5. **Josephat Mulindo, Kenya Agricultural and Livestock Research Organization (KALRO), Kenya**

The role of bees as a biological fencing agent has been used in Kenya, more so in crop-producing areas near wildlife reserves. The bees are a deterrent to elephants and other wild herbivores. Very little information is available on the benefits from this practice. Any experiences with the same?

Nutritional and dietary benefits: The bee brood (larvae, eggs, honey and wax mixture) is fed to the old and invalids as medicine in the beekeeping areas of Kenya. Honey, though consumed as a stand-alone product, remains an important input in the traditional breweries. It also forms an important ingredient as a sweetener for traditional herbal medicines. Propolis is chewed to prevent infections in the mouth cavity. Nutritional uses of the hive products varies across the different beekeeping communities in the country.

6. **Eloundou Tsanga Germain Grégoire, Center for Communication and Sustainable Development for All (CECOSDA) Cameroon**

[English translation coming soon]

I. **Les bénéfices Alimentaire et Nutritionnels des produits de la ruche**

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Les bénéfices des alimentaires et nutritionnels des produits de la ruches reconnus par notre communauté sont fonction du niveau d’appréhension et de connaissance de ces produits par la population concerné. Néanmoins plusieurs produits des abeilles tels que : le miel, la cire, la propolis et autre ont fait leur preuve.

- Le miel dans notre communauté est utilisé comme catalyseur ou complément dans la composition de certain médicament. On l’utilise dans les cas de brûlures, certaines personnes vont même jusqu’à dire qu’il joue le rôle de spermicide ;
- La cire est généralement utilisé pour la fabrication des bougies ;
- La propolis par contre présente une valeur thérapeutique plus exceptionnel dans le traitement de certain maux ;
- Certain apiculteur se sont perfectionné dans l’apithérapie qui constitue une seconde source de revenu pour leur exploitation.

Voilà en bref quelques-uns des bénéfices alimentaires et nutritionnels des produits de la ruche qui sont connus de notre communauté. La science étant en pleine essor la responsabilité d’apporter plus de objectivité à ce domaine porteur et prometteur pour les en développement comme le Cameroun la reviens entièrement.

II. La disponibilité en miel

Au Cameroun par exemple la disponibilité en miel peut être assurée toute l’année car le pays disposant d’une multitude d’écosystème et zone agro écologique, ce qui représente un atout favorable. Comme l’affirme les propos de Fabien OWONA, apiculteur, dans son interview avec la voix du paysan « je dispose actuellement de plus de 600 ruches disséminées dans 4 localités : Bikok dans le Nyong-et-So’o, Ngoumou dans la Mefou-et-Akono, Batchenga dans la Lékié et Kribi dans l’océan. Je diversifie les lieux de production dans le but de satisfaire ma clientèle, car certains préfèrent un miel provenant de la savane, quand d’autres ne jurent que pour un miel de la forêt. Je le fais aussi par prudence, car l’environnement est de plus en plus changeant, et les saisons de floraison des arbres varient aussi ». Une solution plus vertueuse encore est celle de l’application des technologies Agro-forestière qui implique la mise en place des systèmes sylvicole ou agro sylvicoles.

III. Les perspectives d’avenir pour l’apiculture au Cameroun

La filière étant encore sous développer et mal connu du grand public, il est important d’impliquer la force machinale que sont les jeunes à comprendre les bienfaits et la portée de cette nouvelle ouverture pour l’industrie et la promotion de l’auto emploi. Une étude récente faite par le centre de communication pour le développement durable pour tous (CECOSDA) auprès d’une association de développement communautaire rurale (COPAL à BATCHENGA) nous permis de constater que :

- Une intégration des activités l’apicole dans leur programme d’adaptation contre le changement climatique et d’insertion jeune dans le monde rurale ;
- Une identification des espèces mellifères locales ;
- Une disponibilité en machine et manuel techniques d’extraction.
Fort de ce constat le CECOSDA a apporté son appui en matière communication pour amener un plus grand public à intégrer cette nouvelle idéologie. Cette association a bénéficiés de l’apport technique des experts de l’ONG cecosda sur les questions de développement durable et d’agriculture écologique. De telles initiatives de la part des ONG montrent une volonté de pérenniser le secteur apicole. Ce pendant l’Etat du Cameroun à travers ses ministères techniques (MINADER, MINRESI...etc.) se doit de professionnaliser ce secteur d’activité en la dotant de financement, d’outils matériels capable de produire un miel qualité. Dans beaucoup de pays en voit développement l’on trouve une multitude de centre de formation en domaine de production végétale, animale, forsterie ou encore pêcherie mais pas en apiculture, qui interviennent comme un simple module pendant le processus de formation. Or la relation écologique entre abeille et plante est un million essentiel à survivre du règne végétale dans le processus de pollinisation, sans compté les autres services environnementaux rendu par l’abeille et le métier d’apiculture.

IV. Que pouvons-nous faire pour créer des conditions durables pour permettre la coexistence entre l’agriculture et l’apiculture et leur relation bénéfique mutuelle ?

Nous en tant que ONG nous préconisons des solutions basées à plusieurs niveaux d’encadrement pour créer ou renforcer les conditions durables permettant la coexistence entre agriculture et apiculture et leur relation bénéfique mutuelle.

1er niveau : ce niveau d’implication relève du domaine de la communication. Il est important que tous les acteurs du développement soit sensibiliser et former sur les risques que cour la planète en marginalisant les pollinisateur en particulier les abeilles. Former et informer les preneurs de décision sur les éventuelles retombées de la prise d’une mauvaise décision.

2er niveau : sur le plan institutionnel, il faudra prendre en compte l’avis des expert dans la prise de décision ; créer des centre de formation qui pourront former au même titre qu’en agriculture ; statuer des lois à l’égard des pollinisateurs ; professionnaliser le secteur apicole au même titre l’agriculture, l’élevage et autre.

3er niveau : il concerne l’approche pratique, c’est-à-dire préconiser l’agriculture biologiques qui peut d’effet négatif à la survie des abeilles et du métier d’apiculteur ; un former les agriculteurs à l’application des technologies agro-forestières pour renforcer la cohabitation des deux métiers dans le mêmes espace.

7. Charlotte Lietaer, TECA Team, FAO, Italy

Dear all,

Beekeeping is a wonderful world that we must respect and protect, and that can also be an important source of income for many households around the world. If you are an extension worker, a beekeeping trainer, have a beekeepers’ soul and want to start beekeeping or upscale your beekeeping activity, we invite you to have a look at the information available on the TECA Knowledge base and the TECA Beekeeping Exchange Group which is a good opportunity for beekeepers and stakeholders involved in beekeeping to exchange information and knowledge.
TECA is FAO’s online platform for the exchange of practical information for smallholder farmers. You can find there a wide range of technologies and practices that have been tested by farmers related to agriculture, livestock and crop production, forestry, beekeeping, fishery and aquaculture, capacity development, nutrition, etc. Practices are explained in an easy to understand language and format so that they can be easily implemented by farmers.

Best regards,

The TECA Team.

8. Syed Md.Zainul Abedin Abedin, DAE, Bangladesh

Thank you James for organizing the discussion on bee keeping and related issues.

I am trying to respond to your questions in the following statement.

1. **What are the dietary and nutritional benefits known in your community for bee products?**
   - Among the bee products, honey is considered as a valued food item across whole Bangladesh.
   - It enjoys both dietary and nutritional benefits in our community. People take fresh honey with food and also add with many items of food. Honey is also considered to have medicinal value. It is taken as a remedy of cold and many other ailments. People of Islamic faith consider honey as very precious since there is mention of honey in the Holy Quran and Al-Hadith.

2. **Is honey affordable and available in your community all year round?**

Yes, honey is available in our community all year round. It is affordable to most people though very poor sections of people may not purchase from market. But, they may collect honey from natural hives.

3. **What are the prospects for beekeeping in the future? Beekeeping, poverty alleviation and food security: where are we headed?**

Prospects of beekeeping does not yet look very bright. Only one government agency promotes and supports beekeeping effectively in Bangladesh. However, many people are engaged in beekeeping. If more promotional and supportive measures are taken beekeeping for poverty alleviation and food security may realize its potential.

4. **With diseases, pests, habitat loss, colony collapse and climatic changes increasingly affecting apiculture around the world, what can we do to create sustainable conditions for agriculture and apiculture to coexist and to benefit from each other?**

Motivational work coupled with training, arrangement of credit for purchasing required materials and maintenance of beehives and colonies may help immensely for creating sustainable conditions for agriculture and apiculture to coexist and to benefit from each other.
9. Muhammad Ariful Haque, Kamfisht Universe Engineering, Bangladesh

Sundarban is the single largest source of Honey of Bangladesh. I think professional honey collectors (Mauwalis) of Sundarban & other interested nearby farmers could be trained up properly for environment friendly honey collection & farming.

All possible best scientific measures needed to be taken for the benefit of honeybees & honey collectors as well. However, where commercial flower farming, and crops oriented to flower density farming is available is also suitable for honey producing in Bangladesh.

10. Lal Manavado, University of Oslo affiliate, Norway

Apiculture; its importance and future

There is a general agreement on the two most important reasons as to why apiculture is going to play a very significant part in our future. The first is concerned with pollination, which is an essential factor in the continued existence of both economically and environmentally essential plants. Secondly, bee products have constituted an important ingredient of human food, and a versatile industrial raw material from the ancient times.

It is possible to identify two main reasons why the bee populations are now under threat throughout the globe. Obviously, this reduction will in turn, threaten some food supplies, particularly fruits, edible seeds, and honey, and will reduce the seed production of many environmentally significant flora. The consequences of this is quite plain in a world burdened with hunger and malnutrition and incredible environmental degradation.

The first threat to bees comes from habitat degradation resulting from human over-population that requires the expansion of infra-structure, housing as well as industrial and agricultural installations.

This degradation entails a significant loss of wild flowers, flowering bushes and trees whose nectar and pollen constitutes an important part of bees' food supply. As the current notion of 'development' requires the undertaking of human activities resulting in this habitat degradation, bees may well face extinction due to starvation in some parts of the 'developed' and the 'developing' world. I know this is happening in many areas of urban Europe.

The second part of the threat stems from the use of insecticides and insect repellents used in agro-industry. Unlike the disappearence of roosting cranes from most parts of Europe due to the disappearence of their prey indirectly brought about by the use of insecticides, bees will simply succumb to those chemical agents.

It is imperative to recall that nobody really knows what genetic consequences bees may suffer owing to their exposure to agro-chemicals now in use. Nectar and pollen contaminated with them may trigger genetic changes in drones and queen bees, which in turn lead to serious dysfunctions in the generations of bees that spring from them. These may include loss of resistance to diseases and/or other acute congenital problems. Moreover, such ill effects may also result from a wide variety of toxic material we have already discharged into our environment, and remains undegraded for a long time.
So, these are the generic problems we need to address. Otherwise, we will face an environmental catastrophe due to a serious loss of bio-diversity, not to mention a significant reduction in global food production and turning what was once an affordable item of food into a luxury. I believe that once reasonably priced honey from Las Marismas in Spain are now beyond the 'common man' after large tracts there were drained for agriculture.

I think it is still possible to reverse this undesirable trend, but it requires the undertaking of several simultaneous programmes, which are intended to address the threats to bees mentioned above, and to increase the bee population, hence their products.

1. Habitat degradation:
   I. Strict control of building and construction projects, and a legal requirement that a certain percentage of the affected area should retain its native flora or its equivalent.
   II. Planting local flowering trees that blossom at different times along roads and highways.
   III. Reforestation of the deforested areas with local flora. This may not be easy or cheap, but I think it is becoming more and more important.
   IV. Educating and encouraging the people to use 'live fences' that flower, growing flowering plants in their gardens, especially those that blossom at different times.

2. Chemical threat:
   I. Real basic research (not surveys) into the toxic effects of agro-chemicals and other common pollutants on bees, and their long- and short term effects on the genes of honey bee.
   II. Research into development of adequate 'feed' for bees to cover short falls due to harvesting the hives or bad weather.
   III. Design of hives for apiculture that afford better protection to bees.

3. Increasing the bee populations:
   I. Educational and material support to actual and potential apiculturists.
   II. Ensuring that the producers and the consumers get a 'fair deal' through legislation, financing possibilities and the establishment of cooperatives for apiculturists.
   III. Bee products are too well-known to require any publicity. But their excellence may be emphasised by nutrition education in schools etc.

Of course, this is only an outline of an approach, which requires to be fleshed with many details. I have not touched on the problem of displacement of one bee strain by another as it has been happening in the US. Although it is a problem to the apiculturist, its environmental and economic consequences are not severe.

I hope that this would be of some help.

Cheers!

Lal Manavado
11. Manoj Kumar Behera, NRMC, India

Dear All,

Bees are important to our planet.!!

The contribution of bee keeping to food and nutritional security is significant owing to the role of bees in cross polination in important food crops in addition to other direct services provided to the human being. Empirical research studies in India suggest that cross polination by bees help in enhancing the yield of staples by 20-40 percent (http://timesofindia.indiatimes.com/city/madurai/Farmers-to-be-trained-to-rear-bees/articleshow/46250363.cms).

Despite their critical roles to welfare of human beings, our technological advancement and modern life style adversely affecting the population and diversity of bees. Furthermore, the farmers are also withdrawing from bee keeping due to various reasons though marking remains the major one. The farmers need to be trained for proper processing, value addition and marketing through partnership or convergence with civil society and private companies.

With the emergence of Climate Smart Agriculture concept across globe, the scope and importance of practice of bee keeping is more. There is growing opportunities to integrate bee keeping in the Integrated Farming Models or agroforestry practices which are more sustainable.

Regards,

Manoj

12. Nancy Morgan, FAO, United States of America

Dear all,

In support of two World Bank livelihood/natural resource projects in Tunisia, we have developed analytical frameworks for undertaking an analysis of the profitability of various income generating activities (in French). One of the modules is bee-keeping.

Attached (http://www.fao.org/fsnforum/sites/default/files/resources/Apiiculture%20Module%20August%202015.xls) is the framework for analysis which is has been discussed with technical experts in Tunisia and is being reviewed by members of the bee-keeping association in Morocco. We are developing a tutorial and are planning a technical training for the last week of September 2015. The audience will be technical advisors to the national projects and hopefully the modules will be adapted by producers as they move to re-investment in their bee-keeping activities. It is obviously critical that investments (whether project funded or not) be reviewed in terms of their profitability/sustainability.

Nancy Morgan

Agricultural Economist, Investment Officer (Agro-Economiste, Charge de l'Investissement)

FAO, Sub-Regional Office for North Africa

Tunis, Tunisia
13. Md. Moshfaqur Rahman, Bangladesh

Dear All;

For Bee farming you need some tech solution & agrometrics assistance. Also weather forecast &
many; because bees are very sensitive & their mortality rate is quite high. I'm an applied remote
sensing expert & forecasting with other agrometrics support is possible from me.

My suggestion will be not to be an over excited about bees; indeed it's quite profitable but it need
caring. I can assist you my contact: moshfaqur@hotmail.com

14. Dosse Sossouga, Amis des Etrangers au Togo (ADET), Togo

[Original contribution in French]

L'apiculture n’est développée au Togo. La destruction anarchique des forêts fait que les abeilles se
rarifient et par conséquent la production du vrai miel qui a beaucoup de vertue thérapeutique et
donc nutritionnelle, n’est plus de qualité.

[English translation]

Beekeeping is not developed in Togo. Uncontrolled destruction of forests caused bees to become rarer
and consequently the production of real honey that has many therapeutic and nutritional values,
declined in quality.

15. Nkwelle Nkede Flabert, Centre for Communication and Sustainable
Development for all CECOSDA, Cameroon

Dear all,

Honey is a pretty amazing substance and there is a lot more to it than just a sweet tasting treat.
Honey plays a crucial role in the life of a honey bee and can also be very beneficial to the human
body.

Honey is a supersaturated sugar solution with approximately 17.1 percent water. Fructose is the
predominant sugar at 38.5 percent, followed by glucose at 31 percent. Disaccharides, trisaccharides and oligosaccharides are present in much smaller quantities. Besides carbohydrates, honey contains small amounts of protein, enzymes, vitamins and minerals. Honey is known to be rich in both enzymatic and non-enzymatic antioxidants, including catalase, ascorbic acid, flavonoids and alkaloids. Although appearing only in trace amounts honey also contains about 18 different amino acids. Honey is much more than just a simple sugar. Rich in minerals and nutrients, honey also has some antibiotic properties that may aid in the healing process. For thousands of years honey has been used by mankind in many capacities to help give the human body energy and health.
Honey as the most widespread bee product is listed in medicine among the most valuable foodstuffs, especially because of its sugar content and other ingredients, such as enzymes, etheric oils and mineral salts. During convalescence after serious diseases and operations, doctors give their patients a 20-40% specially processed, sterilized honey dilution, which is showing great results.

In the Batchenga community, Centre region of Cameroon, there are about 28 farmers practice bee farming which is promoted by “Centre pour l'Environnement et le Développement” (CED) Cameroon. In this community, honey serves as a major source of income for the farmers and they confirm that bee farming provides them with about twice their initial yearly income as crop farmers.

However, bee farming is hindered because of the use of pesticides which greatly reduce the population of bees. A research, published in Nature scientific report on Thursday, combined large-scale pesticide usage and yield observations from oilseed rape with data on honeybee loses between 2000 and 2010.

16. Matraiim Jusupov, Kyrgyzstan

[Original contribution in Russian]
Уважаемые коллеги,

Пчеловодство в Кыргызстане - это традиционный вид деятельности, который базируется на разнотравье предгорных территорий и высокогорных пастбищ. В настоящее время в год собирается всего около 1,5 тысяч тонн меда. В период расцвета пчеловодства производилось от 8 до 11 тысяч тонн меда. Сокращение производства меда произошло из-за потери рыночной инфраструктуры и роста затрат на производство. Помимо производства меда пчёлы играют важную роль в опылении цветущих растений. В стратегическом плане пчеловодство Кыргызстана будет направлено на возрождение уровня производства меда и рост экспорта продукции пчеловодства. При этом получит поддержку территориальное распространение пчеловодства в регионы, где оно не является традиционным видом деятельности. Необходимость увеличения продуктивности растениеводства за счет улучшения опыления садов и полей станет дополнительной поддержкой развитию пчеловодства.

С уважением, Матраим Жусупов - эксперт по сельскому хозяйству и водным ресурсам, Бишкек, Кыргызстан

[English translation]

Dear colleagues,

Beekeeping in Kyrgyzstan is a traditional activity, based on foothill areas and mountain pastures. Currently, in one year the production is of only about 1.5 thousand tons of honey, while in the heydays beekeepers produced from 8 to 11 thousand tons of honey. This reduction in honey production is due to deterioration of market infrastructure and increased production costs.
In addition to the production of honey, bees play an important role in the pollination of flowering plants. In strategic terms, beekeeping in Kyrgyzstan will aim to reach the previous level of production of honey and growth of bee product exports. This will be supported by the territorial spread of beekeeping in the regions where it is not a traditional activity. The need to increase crop productivity by improving the pollination of orchards and fields will further support the development of beekeeping.

Sincerely, Matrei Zhusupov - expert on agriculture and water resources, Bishkek, Kyrgyzstan

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17. Ben Butele-Adramah, Self Help Africa-Uganda Country, Uganda
[Reply received through the TECA Exchange Group]

Please find some responses to the discussion Questions from the community in Uganda.

“Bee products: providing nutrition and generating income - Honeybees, beekeeping and bee products in our daily lives”.

Discussion questions and Answers provided:

1. What are the dietary and nutritional benefits known in your community for bee products?
   Answer 1:
   - The Nutritional and dietary benefits include;
   - Honey is food, Liquid honey is used as sweetener in beverages (Tea/coffee or cocoa hot drink
   - It is also used as ingredient for fruit jams or as flavorings agent in gums or marmalades
   - Creamed honey is a recipe used in peanut butter and this used as spread on bread, cake or even for eating freshly boiled cassava and potatoes.
   - Honey is also used as ingredient in bakery products and confectioneries
   - Nutritional benefits that are associated to health include;
   - Honey mix with propolis is herbal concoction for cough syrup; it also helps ease general body pain and muscle fatigue.
   - The health benefits are general strength, mental efficiency and honey also improves food digestion and assimilation due to the enzyme properties it has.
   - It is also remedy for cold/flu, mouth and throat infection and bronchial infections
   - In wounds, sores, it is used as antibiotic and a steriler and improves healing.
   - It contributes to reduction of heart diseases.

2. Is honey affordable and available in your community all year round?
   Answer 2:
   - Generally speaking honey and other bee products are available throughout the year. There are two seasons for honey harvest that follows the crop flowering calendar, however with
the improved technologies farmers are adopting, (like use of improved hives and harvest skills), most farmers are able to harvest honey at any time of the season of the year for household consumption.

- There is also wild honey within the community that is harvested from natural forests and protected areas and this increases the availability of honey for the community.
- The price per kilogram ranges from (US Dollar 3-5; Equivalent UGX 10,000-15,000). This is unaffordable to non-beekeepers. It therefore means households who enjoy the nutritional benefit of bee products are mainly the beekeepers and the middle class.

3. What are the prospects for beekeeping in the future? Beekeeping, poverty alleviation and food security: where are we headed?

Answer 3:

Beekeeping has emerged as a very successful agricultural practice that is contributing to food security and enterprise development within the local people in rural areas with self-driven interest especially among those of less income base.

This is attributed to the benefits; of high return on investment, less labour intensity, requirement of few inputs, less land and capitalizes on a ready supply of pollen which the communities have now realized and taken advantage of. In rural areas there is almost an unlimited source of pollen and bees aid greatly in the natural cross-pollination of local crops.

The local authorities have also taken active lead to mobilize the communities in development of apiary subsector of agriculture.

At the National level, The Ministry of Agriculture (MAIIF) in partnership with development agencies under the umbrella of The Uganda National Apiculture Development Organization TUNADO and ApiTrade have initiated a National Apiculture policy (NAP) a policy process for the developing and integrating the apiculture into national programmes.

Overall there is gradual but progressive trend of development in the beekeeping sector and this is increasingly contributing to poverty reduction and food security in the community.

4. With diseases, pests, habitat loss, colony collapse and climatic changes increasingly affecting apiculture around the world, what can we do to create sustainable conditions for agriculture and apiculture to coexist and to benefit from each other?

Answer 4:

The role of forests with focus on climate change has increased interest in ecosystem restoration as a means for adaptation. Climate change has become one of the key drivers pushing integrated approaches for natural resources management into practice. Beekeeping provides this leverage because of the direct and indirect links.

In my view priority is to do with policy; The Communities, Leaders, Development partners, Conservation institutions and governments have to work on policies and approaches that promote Climate smart agriculture and organic farming.

The biggest challenge in the beekeeping sector is the use of inorganic control of crop pests and diseases which have great negative bearing on bee population and survival. The sustainable
approach would be to support the communities to adopt integrated organic farming with limited use of chemicals of any form.

The “natural infrastructure” (Forests/wetlands) degradation for farming systems has also taken a toll on the habitat loss leading to collapse of colonies and overall bee population dwindling. The development partners that have resource envelopes for agricultural development should channel such resources to more sustainable approaches to promote agro forestry farming systems.

Ben Butele-ADRAMAH
PROGRAMME COORDINATOR

18. Florence Shisanya, University of KwaZulu-Natal, South Africa

There are no known dietary benefits for bee products in my community which are however being used for treatment of all sorts of ailments such wounds/sores, coughs and allergies. Hence, the high demand for bee products. Although bee products are not used as food, money earned from their sale is used to buy food and other needs for families. Bee keeping has been an occupation for some individuals in Kenya. Bekeeping has the potential to alleviate poverty and boost food security. Earlier on honey and other bee products used to be readily available. As the population expands and more land is taken up by settlement and crop farming, honey and other bee products have become scarce and expensive. Traditionally bee keeping was practised in dry marginal areas of Kenya which were not suitable for crop farming and therefore less populated.

There is an understanding that bee keeping is an income generating activity that is less combersome and environment friendly. Stakeholders from NGOs, academic institutions, public and private agencies are therefore promoting the practise in Kenya. Members of communities are being encouraged to actively engage in beekeeping. Hopefully this make bee keeping a sustainale practise.

19. Francis Wanjohi, Szent Istvan University, Kenya

Honey is used for treatment of respiratory problems by some communities in Kenya. It is also used as a substitute for sugar. It is readily available in Nairobi since there are people whose job is to sell honey. Although the honey is not very cheap, it is still affordable.

Some individual farmers and community based organizations are involved in apiculture for income generation. They are able to get good prices for the honey because demand is always high due to its nutritional and medicinal values. However, most of the bee farming is small scale. Main challenges faced by the farmers include inadequate skills, knowledge and resources.

Dissemination of knowledge on bee farming and its benefits coupled with economic empowerment of youths and women can be used to promote apiculture as a means of poverty alleviation.
Разработка единого подхода к решению этой проблемы во всём мире почти невозможное дело. Но, при поддержке глобального сообщества можно хотя бы по регионам включить исследовательские работы по развитию этого вида уникального товара. Не только расширять их колонии или среду обитания, но также учитывать их потребности и вводить в посевные или садоводческие насаждения новые виды растений, которые смогут увеличивать их производительность.

Первая и очень важная проблема - это сокращение территории цветущих растений. Да, на сегодняшний день многие говорят о том, что индустрия убивает и всякое другое, но они даже на одно мгновение не хотят представить себе каково быть пчёлой. Для этого нужно многое изучить. Дело не в этом, дело в том, что исходя из этого опроса что будет сформировано? Будет написан отчёт или сделан единый утверждённый план? Всё это и заставляет человека думать, что писать. В этом случае я лишь отвечу на те вопросы, которые поставлены по пунктам.

1. У нас в регионе, т.е. в Узбекистане производят немалое количество мёда, но она до прихода у потребителю становится уже каши, а не естественным мёдом. Развивать пчеловодство - на это у нас решиться не каждый, так, как есть свои трудности. Кроме того в народе есть умельцы, кто из поколения в поколения держат пчёл медоносных. Потребительский спрос на этот вид продукта тоже немалый, если учесть что и эта каша продается не слабо.

2. На нашем рынке мёд почти круглый год доступен, но опять же не то качество, которая может соответствовать понятию - чистый мёд, а нечто смешанное.

3. Не знаю где как, но я через создаваемые своими руками компаниями хочу добиться одного, чтобы вопрос опления растений будь то в естественных просторах или даже в закрытых помещениях (масштабные теплицы) было возложено на этих пчёл. Так получиться и нектар собрать можно побольше и продукты сельского хозяйства получить в достатке.

4. Совместная работа по вчеловодству возможен лишь в одном случае, когда каждая сторона подтверждает своё равноправие и добивается общей цели вместе. Это и со стороны пчёл надо предусмотреть, хотя по нашему пониманию мы можем спокойно их управлять, на самом деле они тоже имеют свои права. С другой стороны необходимо создать и конечно же финансировать некую часть, ассоциацию пчеловодов мира, с подразделениями по регионам и странам, что в дальнейшем приведёт к осмысленному контролю качества продукции по всему миру. Не надо настаивать, чтобы каждый участник платил взносы, необходимо проработать возможные пути поставки и реализации мёда из разных точек мира, что само по себе предусматривает участие ассоциации, которая свою часть дохода может получать от реализации признанных высоко качественным товаром.
It is almost impossible to develop one-for-all approach to resolve this issue. But with the support from the global community it is at least possible to include research on development of this unique product in the regions. It should not be limited to expansion of their colonies or habitat, but take into account their needs and introduce new types of crops and horticultural plants that will be able to increase their productivity.

Reduction of area under flowering plants is the very first and important problem. These days many people say that it is industry that is destroying it, but they don’t even want to imagine what it feels like for a bee. It requires thorough study. But it is still not the point. The point is what will be formed on the basis of this issue. Will a report be written or a common plan approved? The aforesaid makes a person think what to write. In this case I will only answer the questions point by point.

1. A considerable amount of honey is produced in my home region - in Uzbekistan. But before it reaches consumer its body reminds more of a mush, than of a natural honey. Not everyone in our country will decide to develop beekeeping, since they will have to face difficulties. Besides there are people who’ve been keeping honey-bees for generations. Consumer demand for this kind of product is also considerable.

2. In our market honey is available almost all year round. But still it is not of a quality that complies with the concept of "pure honey", it is more of a mix.

3. Through my own companies I want to achieve that pollination, whether it is done in natural open spaces or indoors (large-scale greenhouses), was made by bees. It means that we’ll be able to collect more nectar and plenty of agricultural products.

4. Joint work on beekeeping is possible only in one case, when each party confirms its equality and through seeking common goal together. And it is important to provide everything for bees. While we think that we can easily manage them, bees also have rights. On the other hand, it is important to establish the World Beekeepers Association and to provide some part of funding for it. Such association will have offices in countries and regions, that in future will lead to meaningful quality control worldwide. It should not be insisted that each participant pays a fee; but it is important to develop possible ways of delivery and distribution of honey from around the world. This process will involve association, which in its turn will be able to derive part of its income from sales of products of recognized quality.

Anyway all these opinions are just a drop in the ocean. But if there is a need for that I’m willing to cooperate within the framework of a project, such as “honey brand” (with the focus on national or regional level).

Thank you for your attention.
21. James Edge, Food and Agriculture Organization of the United Nations, Italy and facilitator of the discussion

Many thanks to everyone so far who has participated in this discussion so far.

What is apparent is the interest in beekeeping and bee products is from people with a wide range of backgrounds from beekeepers to consumers to producers. The issues themselves are also vast, from food standards to marketing to livelihoods and income generation. Bees and beekeeping is having a bit of a renaissance, with news of bee decline in the news across the globe and urban beekeeping taking off in many continents.

These discussions are also timely as Apimondia, the world federation of beekeeper associations, holds its major apiculture congress in Korea this September. Early next year we will also see the launch of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) report focusing on pollination.

We are looking forward to reading the next round of comments.

22. Emile Houngbo, Agricultural University of Ketou (UAK), Benin

[Original contribution in French]

Les abeilles ont un rôle important dans la préservation de biodiversité. Leur existence fait vivre beaucoup d’autres êtres vivants, y compris l’homme. Elles sont très bien connues dans la production de miel, mais force est de constater que le commun des hommes ne lui reconnaît pas les fonctions de pollinisation et donc leur contribution aux rendements agricoles. C’est à ce niveau que des actions d’information, d’éducation et de communication sont encore indispensables.

Au Bénin, les abeilles se retrouvent plus au centre et au nord du pays, au point qu’il est courant de dire que le vrai miel se retrouve dans ces régions, pas au sud. Malheureusement, la pression anthropique dégrade déjà des habitats de ces insectes vitaux. Les techniques archaïques de collecte du miel ne sont pas de nature à protéger les abeilles et leurs habitats. Les actions à développer doivent beaucoup plus se concentrer sur ce que les populations perdraient si les abeilles disparaissaient.

[English translation]

Bees have an important role in biodiversity conservation. Their existence allows many other living beings to live, including humans. They are very well known for the production of honey, but it is clear that the man in the street is not generally aware of their pollination functions and thus their contribution to agricultural outputs. It is at this level that information, education and communication activities are essential. In Benin the bees are found more in the center and north of the country, to the point that it is common to say that the real honey is found in these regions, not in the south. Unfortunately, human pressure is already degrading habitats of these vital insects. The archaic techniques for collecting honey are not likely to protect bees and their habitats. The actions to be developed should focus much more on what people would lose if the bees disappeared.
23. C.Palanivelayutham Chokkalingam, India

In our country honey is considered as one of the nutrition supplement to regular diet. Moreover honey is here affordable and available throughout the year. Bee keeping prospects are more in this region provided proper guidance an training is to be given. To create sustainable condition in this field Farmers producers organisation is one of the innovative idea to be focussed. With this back round there is a possibility of cluster approach of rearing bee hives in garden land condition is much more.

Even crop specific honey production in this region is new trend here. eg. Beehive rearing in drumstick fields yields certain type of honey which is having some nutritive advantages over normal honey. Farmers fetch higher profit from this type of crop specific bee hive rearing.

Finally there is a vast scope in this field to be focussed and to be studied.

24. Solomon Akamiti, University of Ghana, Department of Agric Economics and Agribusiness, Ghana

In Ghana, honey is used for several purposes ranging from medicinal to dietary purposes. Honey is sometimes used for the treatment of cough, extreme cold and some other throat infections. It is mostly mixed with some indigenous herbs for the treatment of some ailments. In some areas honey is used for the production of soups and creams that are known for treating skin diseases. Some people also use the pure honey to treat scares on their skins. There is a great demand for honey in Ghana for both domestic and industrial purposes. For the other products like pollen and propolis, there is little or no domestic market for them in Ghana.

Honey is not too expensive in Ghana. The main challenge is with the standard of production and the authenticity of the product, these concerns arising from the increase in the level of adulterated honey in the market.

Beekeeping has great prospects in promoting food nutrition and alleviating poverty in developing countries. But the sector is still faced with the challenge of unstable bee colonies due to diseases and pests that affect the colonies. There is therefore a need for extensive research into how these challenges can be properly controlled to increase production, sustainability and profitability of apiculture in Ghana.

There is a progressive increase in the number for farmers who are interested in producing honey and its related products in Ghana. But most farmers lack the technical now-how and the appropriate technology on how to produce honey effectively and efficiently. There is therefore a need for extensive research into how these challenges can be properly controlled to increase the production, sustainability and profitability of apiculture in Ghana.

25. Dejakes Osida, Kenya

1. Dietary
   - Honey eaten with bread, eaten with ugali for wine, used direct in black tea instead of sugar
Honey mixed with herbs such as moringa for medicinal use

2. Affordability
- Long rains harvests-April to June- harvest about 10 tonnes
- November to December short rains we harvest between 6 to 7 tones

3. Brighter future
Many entrepreneurs are now investing in modern beehive including my innovation of hybrid beehive technology

4. Poverty
Economically bees product fetch good amount of money and has proved to be one of the sources of income in my community hence it is a poverty alleviator

5. Food security
Due to climate change the project is one of the best since it mitigates climate change, in the absence of other crops such as cereals we do take honey directly thus controls starvation

6. Sustainability
Diseases-control of transfer of combs from one hive to another, innovative measures in frequent inspection to make sure any infected combs are destroyed, to ensure safety feeding methods with supply of clean soft drinking water

7. Pests control
We do greenhouse horticulture technology, use innovative organic pest control, we sensitize farmers to spray late in the evening after bees have gone to sleep

8. Habitat management
Agro-forestry is practiced with water and environmental friendly vegetation in the open field

9. Colony
Periodical checkup to make sure that colonies never separate

10. Climate change
- Farming oil crops (sunflower, simsim) intercropped in every farm so that we double benefit in both
- Mitigation feeding the bees naturally in times of severe drought and irrigation methods applied in our farms

26. Ann Waters-Bayer, Prolinova International Support Team, Germany


Global Forum on Food Security and Nutrition
27. Bella Gabitashvili, Scientific-research center of agriculture, Georgia

- In Georgia, bee products like honey, wax, propolis, pollen, royal jelly, bee venom are characterized by high taste and calorie value. They are used as a daily nutrition as well as a treatment for various diseases. The main product of the bee - honey is harvested in the mountainous regions of the country and stands out by being ecological product, most of it sold on the local market.

- Main interrupting factor for the honey sales is the absence of the laboratory where full chemical analysis of honey will take place and at the same time tested whether it contains toxic chemicals, pesticides and herbicides, therefore relevant certificates will be issued. Governmental agencies are involved in solving the following problems. After certification honey will be exported to Europe which will help entrepreneurs increase their sales.

- In Georgia honey may be delivered throughout the active beekeeping season across the country.

- In the country "Agricultural Cooperatives Development Agency", cooperates under the Ministry of agriculture of Georgia, and aims to promote supporting program of agricultural cooperatives in Georgia. The program will promote honey and bee product production and contribute in reduction of poverty in the country.

- The country has great opportunities in bee product production. Although there are still many problems in the sector, like various bee diseases and pests, affecting bee colonies. It is important to investigate bee diseases and pests which will lead to increase the production of bee products and make beekeeping sector commercially viable.

- Nowadays the number of farmers interested in honey and production of bee products, increases in the country but unfortunately the majority does not have the technical know-how and technology.

28. Florence Egal, Food Security and Nutrition expert, Italy

I have come across bee-keeping in the context of a participatory nutrition project in Somalia. Honey production and beekeeping was one of the livelihoods interventions identified by communities and local NGOs as a means to improve food security of families who had lost their livestock because of the combination of drought and conflict.

The project hired a Kenyan expert who visited the area, studied traditional honey production practices and identified three models of locally appropriate hives, one of which was retained by local beekeepers. Training for construction and operation was then provided. Honey production was multiplied by three by the end of the project.

This component was extremely successful for a variety of reasons:

- there is a high demand for honey from both the local market (for medical purposes) and the Gulf States
honey is stable, can be sold all year and is easy to transport by bush taxi (the beekeepers sent a representative to sell the honey at a better price in the port of Bosasso)

- honey production is based on common property resources, which makes it an optimal coping mechanism and livelihood strategy for displaced people
- people learned to use wax and make candles which provided light at night “and smelled delicious”
- it was one of several synergistic interventions which revived the local economy.

For more information please refer to

29. James Edge, Food and Agriculture Organization of the United Nations, Italy and facilitator of the discussion

Thank you everyone who has taken part in this lively and wide-ranging discussion about bees and bee products.

The importance of bees cannot be understated. In addition to providing honey, their value lies in pollination and ecosystem services, economic value as a source of income and, cultural and religious significance.

We have heard from a number of countries about the range of uses of bee products, including the use of honey in brewing in Kenya, as a medicine or sweetener for traditional medicines, to feeding bee brood to sick bees as medicine. The cost and accessibility of honey was raised in a couple of responses – and, although honey production seems to be available year-round, the general decline and costs of beekeeping has raised the price of honey in some countries.

From a national perspective, there are still a number of countries that do not actively support sustainable beekeeping, or create the right condition for agriculture and apiculture to benefit from each other. Some initiatives were highlighted, such as two World Bank resource projects in Tunisia, which addresses beekeeping as an incoming generating activity. Regional and national initiatives have a critical role to play in sharing knowledge, building capacity and supporting the development of better policies and practices.

A number of responses were hopeful about the future of beekeeping. Bella Gabitashvili from Georgia suggests that the number of farmers interested in beekeeping is increasing, but more technical knowledge is required. Florence Egal in Italy gives an example of how beekeeping can be an optimal coping mechanism and livelihood strategy for displaced people and families who have lost livestock due to famine or conflict.

While pollination was not a direct topic of this discussion there is clearly a need for further discussion on pollination services provided by honeybees. In particular, the challenges bees face in terms of habitat loss, invasive species, pathogens, agro-chemicals and climate change. Lal Manavado from Norway provided us with a succinct summary of some of the approaches needed to address some of these issues.
We hope to follow up on the pollination issues next year. In the meantime, please do join the TECA knowledge base and Beekeeping exchange group to continue the discussion on best practices and technologies in the apiculture sector.

30. Lemma Belay Ababu, Swiss Agency for Development and Cooperation, Ethiopia

Dear James,

Thank you for sharing the consolidated proceeding on the last discussion, it is quite interesting. I am writing you from Ethiopia and I would like to contribute on the last question of the discussion. Ethiopia has diverse agro-climatic conditions suitable for apiculture. But there is quite a huge challenge for bee colony in Ethiopia these days particularly in highlands where there is high crop production. Farmers in these areas highly depend on chemicals for plant protection including herbicide and insecticides. Although there is limited comprehensive information on the volume and magnitude of the loss; this is one of the reasons for increased mortality of bee colonies in certain areas of the country. Moreover, land degradation causing challenges to availability of bee forage is another bottleneck to the sector. Therefore, taking into account these challenges I would recommend the following elements for agriculture and apiculture to coexist sustainably:

1. Promoting sustainable agricultural practices with limited dependence on chemicals has of utmost importance in ensuring coexistence between these two sectors. Policy makers and institutions working on agriculture and apiculture need to closely work together while jointly plan, implementing and learning from one another in making both sectors to coexist together.

2. Promoting participatory watershed management approach. This will have multiple effects as it restore degraded lands and avail bee forage among others environmental services and economic benefits.

Best regards,

Lemma Belay

National Programme Officer

31. Bee Life

Bonjour à tous,

Voici la contribution de Bee Life à la question 4. « Sachant que les maladies, les ravageurs, la perte d'habitat, la disparition des colonies et le changement climatique ont de plus en plus d'effets négatifs sur l'apiculture dans le monde entier, que pouvons-nous faire pour créer des conditions durables pour permettre la coexistence entre l'agriculture et l'apiculture et leur relation bénéfique mutuelle ? »

Tout d'abord, qui sommes-nous ? En deux mots, Bee Life est un regroupement d'associations apicoles à travers plusieurs pays d'Europe. Depuis plusieurs années, nous agissons auprès des
Pour nous, l'agriculture et l'apiculture sont bien sûr indissociables puisque l'abeille mellifère dépend de l'environnement agricole pour se nourrir et se développer d'une part, et que d'autre part, avec l'ensemble des pollinisateurs, elle est à la base du service de pollinisation et ainsi de notre sécurité alimentaire. Retrouver une synergie entre le secteur agricole et apicole est donc un défi majeur. Réussir un tel pari, va de pair avec la construction d'une agriculture favorable à la biodiversité répondant aussi à des questions sociales, de santé et économiques.

Le dossier PAC & Pollinisateurs que nous avons préparé en collaboration avec Slow Food, reprend les principes clés pour penser, construire et aboutir à une agriculture plus respectueuse des pollinisateurs.

Pour Bee Life, les priorités sont les suivantes :

1) Arrêter la mise sur le marché de pesticides toxiques pour les abeilles

Les pesticides, dont les plus toxiques pour les abeilles à l'heure actuelle – les néonicotinoïdes – causent de nombreux problèmes d'intoxication partout en Europe, aussi bien pour les abeilles domestiques que pour l'ensemble de la faune des milieux agricoles (oiseaux, vers de terre, crustacés terrestres,...). Une des priorités est d'arrêter la commercialisation de tels produits. D'autant plus qu'il a été démontré que l'usage des graines enrobées de néonicotinoïdes n'offre qu'un contrôle partiel des ravageurs, sans parler des ravageurs qui ont développé une résistance aux produits.

Malgré les nombreux avertissements, le processus d'évaluation et de gestion des risques des pesticides laisse, encore aujourd'hui, la place à l'autorisation de substances ayant un haut risque pour les abeilles. En juillet 2015, par exemple, une substance active toxique pour les abeilles, le SULFOXAFLOR, a été autorisée par les décideurs européens malgré les avis défavorables de l'Agence européenne de sécurité des aliments. Ces décisions sont catastrophiques pour la biodiversité.

Par ailleurs, des bases légales et scientifiques plus complètes sont aujourd'hui disponibles au niveau européen. Toutefois, elles ne sont toujours pas appliquées adéquatement. Il est aujourd'hui essentiel que les décideurs politiques les mettent en œuvre et les respectent.

2) Réduire l'utilisation des pesticides

Au niveau européen, la directive 2009/128/CE pour l'utilisation durable des pesticides vise notamment à réduire l'utilisation de ces derniers. Des plans nationaux doivent ensuite être établis et appliqués.

Aujourd'hui, des mesures « basiques » comme la lecture appropriée de l'étiquette du produit phytosanitaire ou la non-application des produits pendant la floraison ne sont plus suffisantes. Il faut prévoir des changements plus profonds.
Un regard différent sur le territoire sera nécessaire pour réussir à associer les pollinisateurs aux agro-écosystèmes. De nombreuses mesures vont déjà dans ce sens, il s’agit des techniques de l’agriculture biologique, le bio-contrôle des ravageurs, des techniques agronomiques comme la rotation des cultures, l’agroforesterie . Un appui technique allant dans ce sens devra être développé pour aider les agriculteurs dans leurs démarches. De même, le monde scientifique devra travailler en étroite collaboration avec les agriculteurs afin que les connaissances des uns comme des autres soient valorisées et diffusées à grande échelle.

Ce changement est nécessaire non seulement pour la santé des pollinisateurs mais également pour la santé des agriculteurs, des habitants des espaces ruraux et des consommateurs. Trop nombreuses sont les études et les documentaires qui démontrent les effets toxiques des produits phytopharmaceutiques sur notre santé partout dans le monde.

3) Promouvoir les partenariats agriculteurs et apiculteurs, en utilisant l’abeille comme ‘observateur’ du territoire et du paysage agricole

La présence d’abeilles (domestiques et sauvages) sur un territoire agricole est une assurance de qualité environnementale (eau, sol, air) et d’écosystèmes en équilibre . Or, ces dernières années les mortalités des colonies dépassent une moyenne de 30% dans certains pays et atteignent les 80% à 90% dans certaines zones rurales. Un sixième des abeilles sauvages sont aussi en voie d’extinction. Si des données supplémentaires étaient disponibles au moins 50% seraient considérées comme menacées . Ces mortalités sont des indicateurs du déséquilibre des agroécosystèmes et des cycles naturels.

Comprendre et répondre aux besoins vitaux des abeilles (des ressources florales diversifiées disponibles en quantité qui fleurissent tout au long de l’année et un environnement avec une faible quantité de pesticides ou un faible degré d’exposition), c’est créer un espace agricole de grande qualité environnementale.

De réels partenariats pourraient être instaurés entre agriculteurs, apiculteurs et techniciens afin de construire ensemble des solutions à mettre en place, en tenant compte des besoins de chacun.

Sans « sacrifier » des cultures, il est possible de créer sur des exploitations agricoles des dizaines d’hectares de couverts végétaux d’intérêt mellifère, plusieurs kilomètres de haies et d’alignement agroforestier en promouvant ainsi des synergies pour l’exploitation : autonomie de la ferme (fertilité, énergie, fourrage), réduction des coûts énergétiques de production, amélioration des cycles de l’écosystème, réduction des pesticides, création d’un capital bois et biomasse .

C’est ce type de vision globale des agroécosystèmes qu’il faut promouvoir sur le terrain et que les décideurs politiques et les acteurs du monde agricole (agriculteur, apiculteur, techniciens)devront s’efforcer de mettre en œuvre si nous souhaitons maintenir les abeilles sur nos terres agricoles.