

**IMPROVING QUALITY OF RWANDAN HONEY
FROM THE NYUNGWE FOREST AREA
FOR THE LOCAL AND EXPORT MARKET**

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TABLE OF CONTENTS

LIST OF ACRONYMS	1
BACKGROUND	1
ABOUT NORTH WESTERN BEE PRODUCTS	1
MAJOR ACCOMPLISHMENTS OF NWBP	2
SCOPE OF THIS WORK	2
FINDINGS	3
Option one.....	4
Option Two	4
Option Three	5
TIMING	6
RECOMMENDATIONS TO KEY STAKEHOLDERS	7
1. Beekeeping technologies	7
2. Extension Workers	7
3. Training	8
<i>Period for training</i>	8
<i>Extension to other areas</i>	9
4. Sites for beehives.....	9
5. Organisation of associations	10
6. Access to credit for beekeepers.....	10
7. Honey buying	10
<i>Producer price</i>	10
<i>Collection</i>	11
<i>Quality control</i>	11
<i>Buckets</i>	11
8. Ownership and maintenance of buildings	12
9. Marketing in Rwanda	12
10. Evaluation	12
11. Final note.....	12

LIST OF ACRONYMS

ADAR	:	<i>Assistance à la Dynamisation de l'Agribusiness au Rwanda.</i>
MSC	:	Murenzi Supply Company.
NWBP	:	North Western Bee Products.
WCS	:	Wildlife Conservation Society.

BACKGROUND

Beekeeping in Rwanda has been mostly at subsistence level and efficient production of good quality honey from traditional hives is still a long way from being achieved. In some cases beekeepers are encouraged to try various methods of beekeeping without adequate training resulting for example in high absconding rates in the so called 'modern' hives, whereas occupation rate in traditional hives is generally seems to be higher. The cost of modern beehives and the high management associated with such hives is beyond the average village beekeeper. Based on the Zambian experience, traditional beekeeping is economically viable if it is properly administered.

It is in this context that North Western Bee Products, with their long track record of bark hive beekeeping and export of honey to the European Union, were contracted to help their Rwandan counterparts improve the quality of honey for the local and export market, focusing on traditional Rwandan hives.

ABOUT NORTH WESTERN BEE PRODUCTS

North Western Bee Products (NWBP) started in 1979, initially as a government initiated project with funding from GTZ. In 1988 the project was privatized as a limited company with the beekeepers themselves as shareholders. The beekeepers are organized in village groups to form a loose association. They are then managed by extension workers whose function is to ensure the relay of information between NWBP and the beekeepers and to maintain high quality of honey produced at village level. The extension workers are chosen by the beekeepers, and the beekeepers also elect their own representative to sit on the Board of Directors.

NWBP operates in 5 out of 7 districts in North Western Province of Zambia, covering an area of 75000 square kilometres. NWBP has 6472 registered beekeepers. The annual turnover is 300 metric tonnes of honey. The present Chief Executive Bob Malichi contributed to the establishment of the company in May 1988 and has contributed to its growth to date.

Barkhive beekeeping is dominant throughout the catchment area with focus on small-scale rural community-based beekeepers.

MAJOR ACCOMPLISHMENTS OF NWBP

NWBP received its Organic Certification in 1990 and started to export to Europe the same year. The company received Fair Trade Certification in 2002. When the whole continent of Africa was struck off the list of Exporters of Honey into the European Union, NWBP managed to set up a Residue Monitoring Scheme and Zambia became the first African country to qualify to export to Europe under this legislation in 2003.

To date, NWBP has remained one of the few rural based and community owned companies in Zambia.

SCOPE OF THIS WORK

NWBP Manager Bob Malichi was to travel to Rwanda for two weeks to liaise with relevant partner organizations and to ensure that the four extension workers provided by NWBP to train Rwandan beekeepers were established in their host communities. The second part of the contract would be the practical training of Rwandan beekeepers for a period of four weeks by the four extension workers provided by NWBP. The first part of the report, written by Bob Malichi and outlining his findings and recommendations was to be submitted to ADAR on 30th September 2005.

Expectations:

- Site visits to be made by Bob Malichi to the designated areas where the four NWBP extension workers will conduct practical training for the Rwandan beekeepers;
- Information to be gathered on the sites visited, for example numbers of beekeepers, hives and production levels;
- Possible problems that the Zambians may face and potential solutions to be identified;
- Plan of practical training showing how the training would be scheduled for the four-week period;
- Submission of the first part of the report by Bob Malichi to ADAR.

FINDINGS

During the site visits a number of issues came up. The list below is not exhaustive but includes the key points to consider as well as possible solutions.

Common Problems Identified and Possible Solutions

Problem	Solution
Sudden shift in hive technology from traditional hive to so called 'modern' hive results in high absconding rate with the new technology.	- In some areas the occupation rate in traditional hives was 100%. Beekeepers should continue with their traditional beekeeping methods and only shift to new methods gradually if at all.
Modern hives are being promoted without adequate training or appropriate information about their effectiveness.	- If modern hives are to be promoted the beekeepers should also receive complete training and guidance, but modern hives should not replace the traditional hives, since if the modern hives are to work they must be alongside traditional hives.
Poor quality of honey produced in traditional hives	- To be addressed by the training
High honey prices (in Impashyi the price was 1000RW/kg; other areas was 1000-1300 FRW/kg). Export price offered by Tropical Forest Products is 1275F RW/kg. Local bulk buyer has been recommended to reduce prices to 400 FRW/kg. We don't expect that beekeepers will want to sell their honey at this price even if the market is guaranteed.	- Let demand and supply determine the prices for honey bought from producers. The local market is far more profitable than even the export and should be encouraged. It seems there is high demand for honey on the local market. - Raise the minimum price offered to the producer
Honey combs are being thrown away	- Beekeepers to be taught how to extract beeswax from old honey combs- to be addressed by the training.
Buckets and jerricans for storing honey are without lids	- To be addressed by MSC - n.b. Beekeepers must be supplied with buckets during the training
Language barriers faced by the Zambians whilst working in the area	- To be addressed by WCS before the Zambians arrive: they will each need an interpreter, who will need to be paid.
Not enough honey produced a) Lack of authorized sites b) Some of the sites provided by WCS are not appropriate for bees to forage	- Beekeepers (with the help of WCS) should negotiate with government for permission to put up hives on the edges of the National Park. - Apart from Eucalyptus trees, other nectar producing trees should be planted in areas where honey production is very low.
Logistical problems for Zambian extension workers Difficult for communities to nourish and lodge the extension workers for extended periods.	- If the extension workers stay in one place for more than two nights then they should provide their own food, plates and cups and WCS provide camping tents and/ or sleeping bags.
Ownership of storage facilities at existing collection points (for example at Nyarwungo) and the criteria for using them	- To be resolved by the beekeepers and relevant authorities
Availability of transport to haul produce to collection point (beekeepers cannot be expected to transport their honey to one of the collection centres as they are too far from most of the producing areas).	- To be resolved by the beekeepers and the buyers
Proposed collection centres (4) may not serve any useful purpose,	- Based on Zambian experience, it is better to establish a network of extension workers who would relay information between producers and buyer and inform the buyers when honey was available. With the help of the extension workers the buyers would then travel to the villages to buy the honey.

After reviewing the situation on the field, we discussed with together with WCS/ORTPN and Joël Kayumba, consultant for MSC, a number of options as to how the training would operate and be successful. Below are three options, but option three is the one that the consultant recommends.

Option one

It was suggested that the training be conducted in one single site, where all the four *Zambian* extension workers would be present. The beekeepers would be collected and brought to the site and trained in four shifts, each group for a period of one week. This would have the advantage that one single interpreter could translate for the extension workers. However, we feel that costs of this option outweigh its benefits for the following reasons:

- The method would not be effectively employing the services and skills of the four extension workers.
- The large group size of trainees would be impractical to work with and impart the intended knowledge
- The costs and logistics of bringing all the beekeepers to one place, housing and feeding them would be excessive

Option Two

WCS recommended that the training take place in 8 separate sites. 232 beekeepers, that is 4 taken from each of 58 associations, would be selected to take part in the initial training, and they would then go on to train others. Under this arrangement, the four *Zambian* extension workers would each give demonstrations to beekeepers in two sites for a period of 10 days. Each site would accommodate 29 beekeepers at a time. There are 10 activities or sessions in the job description for the extension workers so the extension worker could allocate a maximum of 5 hours to each session. With this option the focus would be on demonstrating to the beekeepers rather than allowing them to apply the training immediately to their own needs and circumstances. If this option is accepted we should also consider the following constraints.

- Each beekeeper collected for the training will be away from his house for a period of 10 days and his activities at home will suffer.

- Transport will be needed to ferry beekeepers to the sites chosen.
- Feeding of the beekeepers will be required.
- A large number of beekeepers will have to be accommodated at each of the 8 sites.
- An out of pocket allowance to each beekeeper was recommended by WCS (1000FRW per day).
- Other logistical costs such as drivers costs etc brings the total sum required to 350 000 000 FRW.
- WCS indicated that in order to source the required money we would need to postpone the training for at least two weeks.

Option Three

Each of the four extension workers travels from village to village and works with the beekeepers there in all the aspects highlighted in the job description. During the same period the Zambian extension workers would be able to re-group beekeepers based on individual beekeepers' needs, the amount of honey the beekeeper produced and the walking distance from one group to another in a route. The Zambian extension workers would recommend the number of Rwandan extension workers needed in an area and the beekeepers could elect suitable representatives who could take the role of extension worker for each of the clusters of beekeepers after the Zambian extension workers have left.

As a starting point, each extension worker could begin at one of the four collection centres and move clockwise around the Nyungwe forest area stopping at all the beekeeping villages on the way. Given the size of the area, we do not expect that between them they could cover the whole circuit within the given time, but at the end of the 4 weeks, the beekeepers trained would elect their own extension workers who would continue the work until the whole area is covered. This relies on MSC using extension workers in their system of buying.

At this point we still don't know how far apart these beekeeping groups are located but this information would be provided by WCS. Below is outlined how the training process would work.

Zambian extension worker arrives at an association. Working with the president of that association the Zambian extension worker records the number of beekeepers and hives. Depending on the number of beekeepers in the association, the beekeepers would either be advised to split themselves into smaller groups, or join together with others so that each group had a minimum of 6 and a maximum of 30 beekeepers. The size of the area will determine how many groups should join to form a cluster, which will

be covered by an extension worker on foot or by bicycle. In Zambia what constitutes such a cluster of beekeepers is not just a physical distance on the ground but the number of villages and the number of beekeepers in each village, the amount of honey produced by each beekeeper, the amount of time the extension worker spends in each village, the total number of input requirements for each beekeeper (in this case buckets) and the distance the extension worker covers either on foot or on a bicycle.

The Rwandan extension worker would then be elected by the beekeepers. All of this would take one day. Now the Zambian extension worker and the Rwandan extension worker work together moving through the groups in the cluster and conducting the training on cropping and use of smoke, selection and grading of honey, processing and extraction of wax, storage of honey, and bucket care (one and a half days for each group). We would expect that each Zambian extension would have enough time to complete at one cluster area and work with one Rwandan extension worker in conducting the training with the groups in that cluster. However depending on their findings, they may have time to repeat the process with another cluster and work with a second Rwandan extension worker on training the groups in that second cluster.

The system used by NWBP can only be effective in this situation if the beekeepers and the extension workers are working together throughout.

The extension workers stay with the beekeepers in each village but would have tents if necessary. Each extension worker will need an interpreter for the whole period who doesn't necessarily have to be his Rwandan counterpart extension worker. These interpreters will need to be paid either by MSC, WCS or ADAR.

TIMING

The training is due to start next week (beginning of October). However, on the field we concluded that it was not appropriate to conduct training now because the beekeepers are off honey season. Beekeepers we visited had already processed and sold their honey and did not have sufficient honey left for demonstrations when the Zambians come. In general, honey cropping was relatively poor this year due to heavy rains. The main honey cropping season is July-August and another season is February-March. **Therefore we strongly recommend that the training be postponed either to February-March or to July-August 2006. NWBP would be prepared to return to conduct the training during either of these periods if this recommendation is agreed upon.** Beekeepers would benefit a lot if the intended training was conducted during the period when beekeepers are harvesting honey from their hives.

RECOMMENDATIONS TO KEY STAKEHOLDERS

1. Beekeeping technologies

During our visit we noticed that many groups had acquired top-bar or Langstroth hives (so-called 'modern' hives). These technologies were often not proving to be cost-effective because many beekeepers were experiencing high rates of absconding, sometimes at rates of 100%, whereas the traditional hives were nearly always occupied. In some cases the beekeepers had not been fully trained in how to use the 'modern' hives and how to encourage occupation.

Beekeepers should only shift to new hive technologies if there are benefits and the new technology is cost-effective. Proper training in modern beekeeping should be intensified before shifting to new technology. On average the 'modern' hives are 8 times more costly to acquire. If one can not recover the cost of the hive from the honey cropped from that hive then it is a loss making venture.

2. Extension Workers

One of the initial reasons for sub-contracting North Western Bee Products as consultant in this project was so that a number of Rwandans could be trained as extension workers who would work in the Nyungwe area coordinating between beekeepers and buyer and facilitating the trading of honey and beeswax.

Within North Western Bee Products, 28 extension workers are employed part-time to support the 6472 beekeepers registered to supply NWBP. Each extension worker has been chosen by the beekeepers themselves and is responsible for liaising with the beekeepers in the villages along his designated route. The extension workers play a vital role in relaying information between buyer and seller, and act as a mechanism for internal monitoring of honey quality. They have several key tasks, which include training new beekeepers; keeping a record of beekeepers and honey production; forecasting the honey crop, and recording and distributing inputs required by beekeepers such as buckets.

During our consultancy visit to Rwanda there was some lack of agreement as to whether or not extension workers would be employed to carry out a similar role in this project. We recommend that extension workers chosen by the beekeepers themselves are employed on a seasonal basis in the Nyungwe area in order to ensure a more efficient trading relationship between beekeepers and trader. However, it is counterproductive to invest in the training of Rwandan extension workers if the trader does not intend to use this type of system. It is therefore necessary to liaise closely with the intended trader when organising the training in order to harmonise efforts.

3. Training

As noted by David Wainwright, the honey produced by beekeepers suffered from the following quality defects: excess water content; overheating during processing; and contamination from bees and bee larvae. These faults need to be eliminated by effective training of the beekeepers and honey buyers. We have already recommended that the Zambian extension workers cover the following elements during the training:

- Crop forecasting;
- Honey cropping, selection and grading;
- Beeswax processing;
- Bucket cleaning and storage of honey;
- Use of smoke when harvesting.

The Zambians will also use their expertise as extension workers to help the Rwandan beekeepers organise themselves. As mentioned previously, their job description will also include the following elements:

- Carrying out input assessments for each beekeeper;
- Forming of groups and routes according to honey production and active beekeepers per group;
- Explaining the role of the extension worker and allowing clusters of beekeepers to elect their own representatives to be extension workers;
- Keeping a record of the number of beekeepers trained, the number of hives per person in each group, the type of hives and the occupation rate, and the gender ratio of men and women in each group (and training the Rwandans to continue keeping such records).

Period for training

In terms of when the training takes place, it is essential to observe the conditions in the field and be sure that there will be honey in the hives which can be used for practical demonstrations. It may be that not all beekeepers are harvesting at the same time within the Nyungwe area, in which case, there may be some flexibility as to when the training takes place, but it is better to choose a period when most beekeepers are harvesting so that they can immediately apply the knowledge they gain from the training.

Extension to other areas

If the initial training proves successful in the Nyungwe area, the stakeholders could consider extending the project to other areas within Rwanda. In this situation, the visible results in Nyungwe will act as a justification for further funding for the project. In addition, the Rwandan trainees in Nyungwe will themselves be able to train other beekeepers in Rwanda, thus keeping costs to a minimum.

4. Sites for beehives

There seems to be some reluctance to permit beekeepers to put their hives inside the Nyungwe forest. As a result, beekeepers are either using unofficial sites within the forest or have been relocated to sites outside the forest which are not always proving productive for beekeeping. Certain negative impacts on the forest have been identified as being associated with beekeeping activities, such as destruction of vegetation; poaching of wildlife, and fires.

In order to benefit from the bumper crop of *umukipfu* expected in 2006, beekeepers must be allowed to put their hives along the edge of the forest. We recommend a distance of 500m inside the forest. Similarly if the trader hopes to attain organic certification for Nyungwe forest honey for export, the product must come from inside the forest rather than in eucalyptus forest or next to tea plantations. The negative impacts on the forest associated with beekeepers could be alleviated if for example beekeepers were issued with beekeeping permits to enter the forest under the agreement that they will not abuse their right of access. The common advantage will be that bees will continue to cross-pollinate the forest and beekeepers will harvest prime honey, giving them an income which will deter the need to exploit the forest unsustainably for its resources.

If after experimentation it proves possible to produce good crops of honey from hives placed within the pine buffer zone next to the forest, beekeepers could be encouraged to use this zone for beekeeping. Actors responsible for designating legitimate sites for beekeepers should make use of the beekeepers' own intimate knowledge of the local vegetation which is most productive for honey.

5. Organisation of associations

We observed that there are numerous small-scale associations of beekeepers which do not always have a clear sense of purpose or direction. Whether or not beekeepers choose to work collectively or individually, the aim should be that their needs and interests are represented, and that buying and selling is facilitated and efficient.

We recommend that one national beekeepers association be formed and small scale beekeepers should be given the choice to join the national association. North Western Bee Products can advise on the formation of such an organisation as well as the drafting of its constitution.

As mentioned above the establishment of a network of extension workers similar to the system utilised by North Western Bee Products would also serve to improve coordination between individual beekeepers and buyers, and communicate the needs of each party.

6. Access to credit for beekeepers

Small-scale beekeepers should have access to credit and loan facilities. A revolving fund or grant could be set up to enable beekeepers to have access to basic beekeeping items like buckets, honey presses etc. The beekeepers association should train its members in record-keeping, basic accounting etc.

7. Honey buying

Producer price

We encountered a wide discrepancy between the prices currently offered to beekeepers (800 FRW to 1200 FRW/kg) and the price proposed by buyers (400 FRW-600 FRW/kg). We recommend that demand and supply should be the determining factor in fixing the producer prices. Both buyers and beekeepers' representatives can meet to negotiate producer prices. North Western Bee Products has wide experience in price negotiations with beekeepers and the Rwandese can learn from their experiences.

Collection

Beekeepers cannot be expected to carry their honey over long distances to reach the four designated collection centres if the transportation costs they incur are not reflected in the price they receive for the honey. The trader should expect to travel to each village to buy the honey, or to make arrangements to support the costs of transportation.

Quality control

As part of the training required, the buyers must be taught to recognise good quality honey from bad honey and to reject honey that is not of an adequate standard. It is no use training the beekeepers to produce good quality honey if they find that the buyers will accept poor quality honey.

Honey should be bought in liquid form rather than as honey and wax combined. In order to ensure that beekeepers are getting full value from their hive products, they must be trained in how to separate wax from honey. Traditional hives produce a lot of wax which has many uses, and could be sold on the international market or locally, for example as foundation in Langstroth hives, or in body care and household products such as creams, balms, lotions and polishes. These can be produced for the mass market in Rwanda.

Buckets

We recommend that buckets are loaned to the beekeepers at the start of each season and then collected with honey in. These buckets should remain the property of the buyer and records should be kept to keep track of the buckets and monitor their condition and replace them when necessary. In order to motivate the beekeepers and make it as easy as possible for them to sell their honey, they should not be required to buy their own buckets, but a beekeeper who did not return a bucket loaned to him would be liable to repay the buyer with money. Arrangements must be made so that beekeepers have access to buckets and sieves at the start of the training period.

8. Ownership and maintenance of buildings

Several buildings in the communities meant to benefit beekeepers are not being put to good use. The ownership of the buildings is not stated. This was particularly apparent in Nyarwungo sector with the association Buhiye.

We recommend that a small fee be charged to every beekeeper who wants to keep his/ her honey or wax in the commercial warehouses. The small user fee can help with the maintenance of the buildings and meet administrative costs in the association. During honey off-seasons the buildings can be leased out to anyone in the community at a small price.

9. Marketing in Rwanda

Alongside export, there has been discussion of selling Nyungwe forest honey locally. In order to compete against the other honeys available, the trader must first be able to show that he has a good quality honey. This will already give him an advantage over other honey traders selling poor quality products. He will also need to invest in high quality packaging of the standard found on imported honeys in Rwanda. We foresee that there will only be a limited market for honey amongst expatriates and wealthy Rwandans. Therefore the trader should think about ways of marketing the honey to the mass population, perhaps by emphasising its medicinal value and selling it in small containers at a low price per unit, or by marketing a range of cosmetics made with honey and beeswax.

10. Evaluation

At the end of a 3 year period there should be an evaluation to assess the impact of the project on the intended beneficiaries.

11. Final note

In recent years beekeepers have evidently been given contradictory information and instructions as to how and where to keep bees by different people and organisations who have not respected the beekeepers' own expertise. It is crucial that the various actors in this project make every effort to listen to the beekeepers, communicate clearly to them the project's aims and involves them at every stage.