



UNITED REPUBLIC OF TANZANIA
MINISTRY OF NATURAL RESOURCES AND TOURISM
FORESTRY AND BEEKEEPING DIVISION

NATIONAL BEEKEEPING TRAINING AND EXTENSION SERVICES GUIDELINE



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CONTENTS

CONTENTS	i
FOREWORD	ii
ACKNOWLEDGEMENT	v
DEFINITIONS AND GLOSSARY	vi
ACRONYMS	viii
PART ONE: INTRODUCTION	1
1.1 BACKGROUND	1
1.2 THE POLICY DIRECTIONS ON TRAINING AND EXTENSION SERVICES	2
1.3 BEEKEEPING TRAINING AND EXTENSION SERVICES	3
PART TWO: SITUATIONAL ANALYSIS	7
PART THREE: THE GUIDELINES	13
3.1 PREAMBLE	13
3.2 THE GUIDELINES	16
3.2.1 Coordination of Beekeeping Training and Extension Services.....	16
3.2.2 Competence in Beekeeping knowledge and Extension services delivery	17
3.2.3 Quality Assurance, Safety and Marketing of Bee Products	19
3.2.4 Research Results Interpretation and Dissemination	20
3.2.5 Regulatory Procedures in Beekeeping Extension and Training Services.....	21
3.2.6 Emerging Issues in Beekeeping	22
3.3 USERS OF THE GUIDELINE	23
PART FOUR: MORNITORING AND EVALUATION	24
BIBLIOGRAPHY	25

FOREWORD

Beekeeping is one of important sectors in Tanzania economy providing both direct and indirect benefits. Direct benefits constitute honeybees products which include honey, beeswax, pollen, propolis, royal jelly, venom, brood and apilarnil. These products are used in food, cosmetics, pharmaceutical, textiles, leather, electronics and candle industries with local, regional and global markets. Indirectly, beekeeping contributes to crop productivity and biodiversity conservation through pollination services. Through direct benefits provision, the sector employs over two million people along its value chain in rural and urban areas.

The potential for honey and beeswax production annually in Tanzania is big. However, contribution of beekeeping sector to the economy in Tanzania does not reflect the existing potential. The low production of bee products is attributed by poor management of bee colonies and under-utilisation of bee resources. In addition, most of existing beekeeping industries are using inefficient technologies for value addition. These constraints have led to low hive productivity and quality of products, limited diversification and value addition.

Furthermore, market information is not shared among key stakeholders as it should be and inappropriate use of knowledge and skills for stocking and managing colonies by

beekeepers still continues. One of the major reasons that contribute to this situation is the inadequate coordination and lack of guideline in provisioning of beekeeping training and extension services. Effective and efficient training and extension services in beekeeping can only be provided by people or institutions that have beekeeping knowledge and skills for offering extension services.

The National Beekeeping Policy of 1998 promotes and encourages different stakeholders to provisioning of training and extension services in order to ensure that the services provided meet standards. Some institutions or personnel currently offering training or extension services, lack beekeeping knowledge, extension provisioning skills or both. This is not a good practice and it cannot be left to continue. It is therefore the responsibility and interest of the Ministry of Natural Resources and Tourism (MNRT) to make sure that beekeeping training and extension is well coordinated, guided and provided by qualified institutions or personnel. This can only be achieved by enacting regulatory frameworks, supervising their implementations and monitor and evaluate their efficiency, effectiveness, outcomes and impacts. It is against this background, this Guideline has been prepared to establish set of procedures and recommendations that will guide how beekeeping training and extension services will be provided in Tanzania.

The National Beekeeping Training and Extension Guideline (NBTEG) provides the minimum guidance for service

providers and users along the beekeeping value chain. It contains the means by which the government and all service providers will abide to for a successful provisioning of beekeeping training and extension in Tanzania. Areas guided included coordination of training and extension services provisioning, required competence in beekeeping and extension methods, quality assurance, safety and marketing of bee products, research results interpretation and dissemination, emerging issues in beekeeping and regulatory procedures in beekeeping training and extension services.

Preparation of this Guideline has been made through valuable inputs from different stakeholders. Equally important, successful implementation of the Guideline depends on willingness and firm commitment, collaboration and participation of key stakeholders. We therefore look forward for their continued cooperation.

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Preparation of this Guideline has been made possible with participation of a number of institutions. These include: Tanzania Beekeeping Development Organization (TABEDO), Tanzania Honey Council (THC), honey producer groups, bee products traders, SIDO, beekeeping equipment suppliers, non-Government extension and training service providers in four TFS zones (Western, Eastern, Northern and Central). In addition, the Ministry consulted training regulatory authorities namely Tanzania Commission for Universities (TCU), the National Council for Technical Education (NACTE), and Vocational Education and Training Authority (VETA); Retired Beekeeping training and extension services experts, TFS, FBD and Tanzania Forest Fund (TaFF), Consultations were also made to Products quality control authorities namely TBS and TMDA and Presidents Office Regional Administration (PO- RALG) and Local Government officers. Inputs were also obtained from beekeeping related training and research institutions namely University of Dar es Salaam (UDSM), Tanzania Wildlife Research Institute Njiro –Arusha, Beekeeping Training Institute –Tabora (BTI), and Sokoine University of Agriculture (SUA).

DEFINITIONS AND GLOSSARY

Adulteration of bee products: Purposely act of addition of another substance to a bee product that may change the quality of origin product.

Apiary: means a beehive or a collection of beehives, whether stocked or unstocked.

Apiary product: includes live bees, brood, beeswax, honey, cut comb honey, comb sections, bee combs, honey dew, bee collected pollen, bee venom, propolis or royal jelly or any substance declared by regulations to be an apiary product for purposes of this Act.

Beekeeping: is the maintenance of bee colonies (both stinging and stingless bees) in hives located in apiaries for production of bee products including pollination services.

Bee products – all harvests and services that are obtained from honeybees that include honey, beeswax, propolis, bee venom, pollen, live bees, royal jelly, brood, apilarnil and pollination.

Branding: is a promotion of a particular product or company by means of advertising and distinctive design to customer eyes.

Colony Collapse Disorder (CCD) - a term used to describe the mass disappearance of worker honey bees from the hive. The result is break down of the colony.

Diversification: means to produce other bee products than commonly products – honey and beeswax.

Extension Services: is an informal educational process directed toward the rural population that offers advice, information and skills to help them solve their problems and improve their standard of living.

Genetic Modified Organisms (GMO): any organism whose genetic material has been altered using genetic engineering techniques.

Extension Service Providers: refers to individual, group, companies, institutions including private ones and any other body that provide extension services to beekeepers and other stakeholders.

Value addition: A process of changing or transforming a product from its original state to a more valuable state.

ACRONYMS

BTI	Beekeeping Training Institute
CCD	Colony Collapse Disorder
FBD	Forestry and Beekeeping Division
HACCP	Hazard Analysis and Critical Control Point
NACTE	National Council for Technical Education
NBTEG	National Beekeeping Training and Extension Guideline
NGO	Non-Government Organizations
NTA	National Technical Awards
NVTA	National Vocational Training Awards
PORALG	President's Office Regional Administration and Local Government
SIDO	Small Industries Development Organization
SUA	Sokoine University of Agriculture
TABEDO	Tanzania Beekeeping Development Organization
TaFF	Tanzania Forest Fund
TAWIRI	Tanzania Wildlife Research Institute
TBS	Tanzania Bureau of Standards
TCU	Tanzania Commission for Universities
TFS	Tanzania Forest Services
THC	Tanzania Honey Council
TMDA	Tanzania Medicine and Medical Devices Authority
VETA	Vocational Education and Training Authority
UDSM	University of Dar es Salaam



PART ONE

INTRODUCTION

1.1 Background

Bee products include honey, beeswax, pollen, propolis, royal jelly, venom, brood and apilarnil which have uses in food, cosmetics, pharmaceutical, textiles, leather, electronics and candle industries. Bees are the major pollinators of both agricultural crops and natural vegetation contributing to food security, biodiversity conservation and ecosystem sustainability. Crops that depend mostly on pollinations are fruits, vegetable and edible oilseed. Proper pollination of these crops increases fruit size at yield, hastens maturity, produces a more symmetrical fruit shape and lead to production of quality seeds. To ensure effective pollination, farmers in developed countries hire honey bee colonies. This is however, applicable where farmers are aware of the need to protect pollinators from pesticides used to control pests especially insects.

Actors/players that require beekeeping knowledge are spread along the beekeeping production chain that starts from keeping of bees to marketing of bee products. They include beekeepers, extension and training service providers, processors of bee products, bee products buyers, sellers,

innovators, and suppliers of different types of equipment and facilities. In recent years, number of stakeholders involved in beekeeping value chain has increased. Similarly, there is an increase in number of stakeholders involved in providing extension services and training. Unfortunately, with exception of formal training and extension provided by government institutions, activities of non-governmental players are mainly uncoordinated and lack guidance. Majority of service providers rarely collaborate with government experts. Unfortunately, this situation has resulted into disparity in beekeeping practices among extension service receivers.

1.2 The Policy Directions on Training and Extension Services

The National Beekeeping Policy 1998 identifies lack of effective and efficient beekeeping extension services as the major reason for inadequate public awareness on bee products-based industries. These industries could employ many people and improve their socio-economic development and livelihood. To address this challenge, the Beekeeping Policy stipulates a number of directions. These include developing extension packages for different geographical areas and ecological zones ideal for beekeeping, enhancing stakeholders' participation and strengthening coordination of extension and training activities to ensure that messages delivered are not contradictory.

This Guideline responds to the 1998 National Beekeeping Policy aspirations that require: (a) Strengthening beekeeping education to ensure effective dissemination and linkage of technology and information to all stakeholders (b) Extension and training transformation to ensure effective knowledge sharing and capacity building including technology transfer, through registering platforms, input suppliers and market linkages and (c) Promoting participatory approaches in providing extension services through integrated delivery system approach.

In addition, existing legislations requires training providers to register curricula and be accredited.

1.3 Beekeeping Training and Extension Services

Extension is generally the diffusion of applicable information to the community for the purposes of transforming their livelihoods. In the context of rural development, extension is the work of 'change agents' to catalyze awareness, organization, information exchange, and technology adoption among practitioners or other land users. Beekeeping extension services is thus a system that facilitates access of beekeepers or their organizations to new knowledge, information and technologies. This system promotes interaction with research, education, api-business and other relevant institutions to assist them in developing their own technical, organizational and beekeeping management skills and practices. It is geared towards

bringing about relevant knowledge, ideas and technologies required by beekeepers to improve their ways of doing things and enhance their livelihood.

Beekeeping transformation depends entirely on how effectively and efficiently scientific and technical knowledge owned by experts is passed to beekeepers. However, this can only happen if the government effectively coordinates, supervises and monitors training and extension services provisioning at all levels. This is a prerequisite as it ensures that the knowledge generated through training or research reaches the beekeepers as intended.

Effectiveness and efficiency of beekeeping extension can only be achieved where the extension agent has the following competences:

- (i) Beekeeping science and technology obtained during professional training;
- (ii) Extension provisioning skills which include verbal, practical, written and mass communication, group facilitation skills that enable one to know how to communicate and how to use them for benefit of the beekeepers; and
- (iii) Extension management skills that include programme planning, management functions, ethics, and ability to monitor and evaluate performance.

The latter two are obtained during extension training. They are critical areas of competences in the provisioning of

extension services to ensure that knowledge is effectively availed to the beekeepers who need it most. Furthermore, providers of the training must have knowledge of subject matter and competences on delivery methods to ensure teaching and learning take place effectively. The government has authorities that evaluate capability of training institution which, includes the qualification of teachers, general teaching and learning environment; proposed programme; and subsequently approve teaching programmes at all levels. These authorities include Tanzania Commission of Universities (TCU), The National Council for Technical Education (NACTE) and The Vocational Education and Training Authority (VETA). Thus, accredited institutions will be permitted to run proposed training programmes.

It is in this context that National Beekeeping Training and Extension Guideline (NBTEG) has been prepared is to ensure country-wide consistency in skills, knowledge and technology on beekeeping production, processing, value addition, diversification, branding and marketing. The Guideline provides the minimum guidance for service providers and users along the beekeeping value chain. It contains the means by which the government and all service providers will abide to for a successful provisioning of beekeeping training and extension in the country. Further, the Guideline provides guidance on coordination of training and extension services provisioning, required competence in beekeeping and extension methods, quality assurance, safety and marketing of bee products, research results interpretation and dissemination, emerging issues

in beekeeping and regulatory procedures in beekeeping training and extension services.

Expected outcomes of this Guideline interventions will be increased production and productivity, improved quality, enhanced value addition and diversification, and improved marketing of bee products. In addition, observing the Guideline will lead to the achievement of good beekeeping practice state.

PART TWO

SITUATIONAL ANALYSIS

Success of the beekeeping sector depends on the functional training and extension services. There is an indication that the beekeeping sector is growing in terms of number of beekeepers, production of bee products and consumption of honey. Furthermore, the number of actors engaged in promotion and training in beekeeping value chain, value addition and entrepreneurial skills is increasing. However, the current situation does not reflect the expected sectorial goal as evidenced below:

2.1 Potential and Actual Production

It is estimated that Tanzania can accommodate 9.2 million bee colonies with production potential of 138,000 tons of honey and 9,200 tons of beeswax annually. However, the actual average production is 34,500 metric tons and beeswax 2,000 metric tons of honey and beeswax per annum, respectively. This is 25% and 22% of honey and beeswax production respectively when equaled to the existing potential.

In Africa, Tanzania is second to Ethiopia when it comes to production of honey and beeswax and that there have been times when Tanzania was below Zambia in export of honey to European markets. Tanzania has so much unexploited

potential that, it is poised to become one of the major world producers of high quality honey and other apiaary products if it's potential is fully exploited. On average, the quantity of honey and beeswax exported in past five years were 350 tons and 625 tons, respectively. It is estimated that, the sector generates revenue of about USD 1.7 million annually through export of honey and beeswax. However, the contribution of beekeeping sector to GDP continues to be less than 1% irrespective of the existing potential.

2.2 Diversification, Value Addition and Branding

Apart from Honey and beeswax honeybees, other products include pollen, royal jelly, propolis, bee venom, brood and apilarnil. Some of these products are more valuable on the market than honey and beeswax. For example, whereas the price of honey in 2015 was at 3400 - 4000 USD per metric ton, the price of just one gram of bee venom was 350 USD which is about 350,000 USD per kilogram.

Honey from different geographical areas in Tanzania has different chemical and physical properties reflecting the fodder plant composition and diversity. Tanzania Forest Services (TFS) Agency traceability annual studies show that some parts of Tanzania produce organic honey which fetches best prices in EU and USA markets. Accordingly, global reports on organic honey show the demand and prices of organic honey are projected to exceed US\$ 150 million by 2022-end. Although raw materials for branding are available and market opportunities exist, Tanzanian honey continues

to be sold unbranded, consequently fetching relatively lower prices. In West Africa, for example, branding of their honey into OKU white honey, led to a raise of its price by 40%.

On the other hand, bee products value addition has remained at its infancy and activities of just a few dealers. This situation is partly explained by inadequate dissemination of knowledge and technology related to diversification, value addition and branding by extension and training service providers.

2.3 Number of Beekeepers, Gender and Management

It is estimated that there are one million beekeepers in the country. Over 75% of the beekeepers continue using indigenous knowledge characterized by minimum hive management, less use of harvesting technology and protective. The later has been contributing to low productivity and poor quality of products especially of honey that has negatively affected its marketability. On the other hand, the selective cutting of Miombo trees for bark hive making has been reducing the bee fodder and hence source of nectar. The use of bark hive is attributed mainly by limited knowledge of beekeepers on the impacts to beekeeping.

Less improvement of beekeeping technology along with the value chain is also limiting women, youth and the educated to engage themselves in beekeeping industry. Beekeeping in Tanzania is mainly thus continued to be activities of old and less elite rural people. Beekeeping is also not attracting many investors. Yet, demand of bee products especially

honey continues to increase locally and abroad due to, among others, awareness of value of honey as food and its medicinal properties and collapse of beekeeping in Europe and the US due to Colony Collapse Disorder (CCD) syndrome.

2.4 Information Sharing

Beekeeping industry is characterized by limited information on the availability of harvesting, processing, storage and packaging facilities leading to use of inappropriate containers and equipment. The industry is also characterized with lack of sharing market information and limited organization of beekeepers. This situation is the reflection of the gaps existing in the provision of extension services around the entire value chain.

3.5 Provisioning of Beekeeping Training and Extension Services

Training and extension services is mainly provided by the public institutions which include UDSM, SUA, BTI, TFS, TAWIRI, SIDO, TANTRADE and District councils. Non-governmental players is comprised of NGOs, beekeepers Organizations, Beekeeping cooperatives, donors, Private Sector and Individual farmers. In the field, beekeeping extension services providers are characterized by two or more of the following:

- (i) Inadequate skills and knowledge in providing extension services;
- (ii) Extension approach used to deliver messages is

- mainly top down and not problem based;
- (iii) Inadequate knowledge in beekeeping technologies and innovations;
 - (iv) Inadequate capacity to translate and disseminate research-findings;
 - (v) Inadequate capacity of public extension officers to coordinate other players involved in promoting and delivering beekeeping extension services;
 - (vi) Inadequate capacity to develop networks with local organizations, ensuring coordination of services and promoting collaboration with development partners;
 - (vii) Inadequate capacity to supporting marketing, value addition and value chain development for bee products;
 - (viii) Limited knowledge in organizing participatory demand-driven extension program;
 - (ix) Limited knowledge in evaluating local extension programs and document report progress, outcome and impacts achieved;
 - (x) Limited ability to convene innovation platforms to facilitate learning and knowledge exchange; and
 - (xi) Limited competence to develop beekeeping extension packages for different geographical areas and ecological zones.

At the level of organization, beekeeping extension services are characterized by inadequate coordination. As a result, most players especially NGOs, the private sector, groups and individuals are conducting beekeeping extension services with little communication or collaboration with the government or its agencies. The latter is taking place even when these service providers have deficiencies in both

extension skills and / or beekeeping technical know-how. In others cases, training and extension services are provided as promotional events for selling equipment. These situations have brought about serious negative consequences to beekeepers and beekeeping industry at large.

2.6 Training

Post school primary and/or secondary training in Tanzania fall under three categories namely Academic offered by Universities, Technical offered by Technical Institutes and or Vocational offered by Vocational Institutes. The three categories have different goals. The goal of academic training is to advance acquisition of knowledge, skills and abilities required to ensure that a person that has attained the said training will be able to use the acquired knowledge, technology or skills to harness nature profitably. Tanzania Commission for Universities is mandated to recognize, approve and register, accredit and coordinate academic training.

Technical and Vocational training are all competence based, designed to demonstrate that holders are able to apply and use competencies in the relevant occupational sector. The main focus is on what trainee can achieve in the workplace after completing a course. The National Council for Technical Education (NACTE) is mandated to oversee the growth, relevance and quality of technical education in all tertiary institutions other than universities and their affiliated colleges. NACTE awards seven levels of competences.

The Vocational Education and Training Authority (VETA) runs courses and regulates the quality of Vocational training. VETA offers three levels of Certificates of competence I, II and III. **Table 1 below shows VETA and NACTE levels and qualifications**

Table 1: VETA and NACTE levels and qualifications

	NTA /NVTA Level	Name of Award	Minimum entry level
1	NVTA level I	Certificate of Competence I	STD VII
2	NVTA Level II	Certificate of Competence II	NVTA level I
3	NVTA level III	Certificate of Competence III	NVTA level II
4	NTA level IV	Basic Technical Certificate	NVTA level III/Form IV
5	NTA Level V	Technician Certificate	NTA Level IV/Form VI
6	NTA Level VI	Ordinary Diploma	NTA Level V
7	NTA level VII	Higher Diploma	NTA Level VI or FTC
8	NTA level VIII	Bachelors Degree	Level VII/Form VI
9	NTA level IX	Masters Degree	Level VIII
10	NTA level X	Doctorate Degree	Level IX

To guarantee quality training, the three regulatory authorities namely VETA, NACTE and TCU ensure that training institutions use qualified tutors. This is because there is a significant relationship between teachers' competency and students' performance. In addition, learning requires conducive environment especially classrooms that meet

established standards, relevant and quality text and reference books, standard equipment, supplies and other instructional materials.

Beekeeping training in Tanzania falls under two mandates namely academic training which is given University of Dar es Salaam and technical training currently given by Beekeeping Training Institute - Tabora. The former awards a B.Sc. in Beekeeping science and technology and the latter a Certificate (NTA level V) and a Diploma (NTA Level VI).

Beekeeping training in Tanzania is also provided by operators who are not registered by relevant training regulatory authorities. Thus, the programs under these non-registered operators have never been approved or vetted. Consequently, the certificates offered are unrecognised and cannot be used as evidence for competence and to pursue further studies. The current state of beekeeping sector reflects weaknesses in the country's training and extension services system. In this context, the Guideline becomes one of the Government's instruments to oversee provisioning of training and extension services in the country.

PART THREE:

THE GUIDELINES

3.1 Preamble

The Ministry of Natural Resources and Tourism has a responsibility, among other things, of establishment of regulatory framework and supervising implementations of various policy statements. The Ministry is also responsible to monitor and evaluate the outcomes and impacts of the implementation of various policy interventions by public and non-government organizations. The National Beekeeping Training and Extension Guideline forms the basis of a practical guidance for service providers and users along the beekeeping value chain. The Guideline puts together the means that the Government and Service Providers will adhere in provisioning of services. It is a compilation of recommendations that have been agreed by stakeholders involved in the provision of training and extension services.

The Guideline has six areas namely: coordination of beekeeping training and extension services; competence in beekeeping and extension methods; quality assurance, safety and marketing of bee products; research information dissemination and utilization; linking beekeeping with

emerging issues and other interventions and regulatory procedures in beekeeping training and extension services.

3.2 The Guidelines

3.2.1 Coordination of Beekeeping Training and Extension Services

Beekeeping sector is growing along with the growth of the number of stakeholders providing Training and extension services. Over years several non-state actors have been carrying out beekeeping training and extension without collaborating with or consulting technical staff of the relevant Authorities. Given this situation, some of the services provided are incorrect, misleading and not uniform and to some extent intended to promote sales of certain equipment or products. Coordinated training and extension services will contribute to the improved, information sharing on marketing, availability of bee equipment and beekeeping technologies among stakeholders and beneficiaries.

In order for beekeeping training and extension services to be properly coordinated, service providers:

- (i) *Shall* be recognized based on competencies and capabilities that have been accredited by relevant regulatory authorities;
- (ii) *Shall* prepare information packages for beneficiaries that comply with directives and approved manuals;
- (iii) *Shall* only publicize information on packaging

materials, apiary equipment including hives and other materials, which are in accordance with approved standards. Information on marketing shall cover but not limited to market quality and quantity requirements, place and related price;

- (iv) *Shall* resolve and harmonize issues through meetings and platforms;
- (v) *Shall* adhere to directives issued or approved by the line Ministries and regulatory or accredited authorities; and
- (vi) May organize meetings and platforms independently or in collaboration with associations or responsible authority.

3.2.2 Competence in Beekeeping knowledge and Extension services delivery

Development of the sector greatly depends on advancement of science and technology which reaches beekeepers through training and extension services provisioning. It is therefore, only competent trainers or extension service providers that will be able to deliver the required knowledge and skills to beekeepers and other stakeholders along the production chain effectively and efficiently.

In order to avoid provision of substandard services to beneficiaries and other stakeholders, service providers:

- (i) *Shall* have training on extension education delivery;

- (ii) *Shall* prove his/her competence on a respective area in the beekeeping value chain such as production technology, processing technology, diversification of bee products, value addition, pollination services management and others;
- (iii) *Shall* conduct extension and training that is backed by research findings, up to-date technology and/ or proven experience;
- (iv) *Shall* use proper teaching aids for example audio-visual facilities for effective delivery of extension and training services;
- (v) *Shall* use approved beekeeping extension and training manual or modules;
- (vi) *Shall* conduct beekeeping training based on curricula approved by relevant regulatory authority;
- (vii) Beekeeping training in Tanzania *shall* only be conduct by Institutions accredited by relevant authorities;
- (viii) Beekeeping extension services *shall* be provided by individuals, groups, NGOs, CBOs and any other institutions that are registered by the line Ministry;
- (ix) May possess the following training facilities: demonstration apiary, protective gears, equipment for production, harvesting, processing packaging and value addition depending on the area of the service offered;
- (x) *Shall* attend refresher training in beekeeping to update knowledge and skills; and
- (xi) *May* attend training in planning, monitoring and evaluation, financial management, proposal writing and entrepreneurship.

3.2.3 Quality Assurance, Safety and Marketing of Bee Products

There has been some improvement in the quantity and quality of bee products following the approval of the National Beekeeping Policy of 1998, enforcement of beekeeping Act No. 15 of 2002, Beekeeping Regulations of 2005 and Guidelines for Quality Control of Bee Products of 2005. Nevertheless, much still need to be done by considering existing potential and advanced technologies.

Appropriate facilities and equipment for harvesting, processing, packaging, storage and transportation of bee products that contribute to improve quality of bee products is still not used by all beekeepers. Adulteration of bee products done by unfaithful beekeepers and traders which not only affects quality but also products' safety is still being reported in different places.

In order to ensure quality, safety and improved marketing of bee products service providers:

- (i) *Shall* provide knowledge on the use of the appropriate equipment and facilities for production, harvesting, processing, packaging and storage of bee products;
- (ii) *Shall* train or demonstrate proper harvesting of bee products and processing techniques;
- (iii) *Shall* stress compliance to standards on bee products

- processing and storage premises as stipulated by TBS or TMDA specifications;
- (iv) *Shall* stress safety procedures of all bee products according to Tanzanian Guidelines for Quality Assurance of Bee Products, Food safety management systems and Hazard Analysis and Critical Control Point (HACCP) principles;
 - (v) *Shall* provide information on local and external markets of bee products, market channels and market requirements;
 - (vi) *May* provide information on the possibility of branding of products; and
 - (vii) *May* provide information on market of organic products and requirements.

3.2.4 Research Results Interpretation and Dissemination

Research findings are important in the development of beekeeping industry. Thus the ability of extension service providers to interpret research results is necessary. In addition, extension service providers have the role to advocate the use of equipment and technologies that have been locally tested and their usefulness guaranteed. Extension service providers will also play a role of liaising between beneficiaries and the Government on beekeeping problems or opportunities that require research attention.

In order to fulfill these roles extension services providers:

- (i) *Shall* find relevant research findings for use and disseminate to beneficiaries;
- (ii) *Shall* advocate use of technologies and equipment that have been locally tested and meet established standards;
- (iii) *Shall* play the liaison role between extension beneficiaries and government or researchers;
- (iv) *Shall* disseminate new innovations in beekeeping, especially those that consider national priorities and needs of the users, and has been registered by relevant Authorities; and
- (v) *Shall* disseminate information on good practices to extension services beneficiaries

3.2.5 Regulatory Procedures in Beekeeping Extension and Training Services

Formal training provided in Tanzania is regulated by TCU, NACTE or VETA. Only institutions that meet the requirements of these organs can offer legitimate beekeeping training in Tanzania. Trainees from such bodies are expected to exhibit competence of that particular level of training. Similarly, extension service providers need to be recognized and monitored by line ministry as a way of ensuring that quality and relevant knowledge and technology is passed down to extension services recipients.

In order to comply with regulatory procedures:

- (i) Extension Service providers shall adhere to the National Beekeeping Policy, The Beekeeping Act, Beekeeping Regulations and other relevant Legislations;
- (ii) Service providers in training shall operate in accordance with relevant regulatory authority training requirements;
- (iii) Any person or institution wishing to start beekeeping training in Tanzania may require assistance from institutions offering beekeeping training when developing their curriculum or training programmes;
- (iv) Extension service providers shall be registered by the line Ministry or its Agencies;
- (v) Extension service provider shall report to the Local Authority before and after service provision;
- (vi) Service provider shall keep records of the service offered for reference purposes; and
- (vii) Service providers may use print media or digital including online platforms to disseminate information except for policy issues which shall be handled by the line Ministry.

3.2.6 Emerging Issues in Beekeeping

Honeybees and beekeeping currently faces nontraditional threats that reduce its contribution to food security, income, biodiversity conservation, health, ecotourism and industrial

development. The emerging issues include climate change, bio-safety, pollution, invasive and alien species, GMOs and Colony Collapse Disorder. It is necessary for training and service providers to incorporate emerging issues in provisioning service to beekeepers and other stakeholders along the value chain.

In order to create awareness on emerging issues with impact to beekeeping, services providers:

- (i) *Shall* develop capacity on emerging issues related to beekeeping;
- (ii) *Shall* streamline emerging issues in beekeeping training and extension;
- (iii) *May* provide knowledge about emerging issues and their impact to beekeeping; and
- (iv) *May* provide knowledge linking beekeeping with relevant interventions.

3.3 Users of the Guideline

The Guideline is a working tool for all stakeholders involved in beekeeping extension and training as service providers, managers or regulators and beneficiaries both in government and non-government players. It also applies for media based extension, internet based, commodity based, training and visits models for specific modules, research and extension and community based extension and training.

PART FOUR:

MORNITORING AND EVALUATION

The Beekeeping extension and training guideline is a tool for implementation of the Beekeeping policy. The guideline will be implemented by all providers of extension and training services in Tanzania working in the government departments, government agencies and non-government players. Daily monitoring of the guideline will be carried out by local government authorities at district level, agencies, research and regulatory institutions. Monitoring and evaluation of the outcomes and impact of the implementation of the Guideline will be carried out by the responsible Ministry. This evaluation will be carried out after every five years and outcome of the monitoring and evaluation can be used to improve the Guideline.

BIBLIOGRAPHY

- Daniel, E (2013) *Assessment of agricultural extension services in Tanzania. A case study of Kyela, Songea Rural, and Morogoro Rural Districts*. Internship in Plant Sciences Supervised by Wageningen University in collaboration with the Africa Rice Center (AfricaRice).
- Gwivaha, F. A (2015) *Factors that impact agricultural extension training programs for smallholder women farmers in Njombe District, Tanzania* Graduate Theses and Dissertations 14801. Iowa State University. <https://lib.dr.iastate.edu/etd/14801>
- MNRT (2007) *Mwongozo wa Uhakiki na Ubora wa Mazao ya Nyuki Tanzania*. Tanzania Forest Services, Dar es Salaam, Tanzania.
- Moshi, P. P. M (2016) *Tanzania Honey Export and Standards to the European Union*. Analytical paper submitted in partial fulfillment of the requirements for the award of Certificate in Specialized Course TRP 302: International Trade Policy and Trade Law Submitted to Trade Policy Training Centre in Africa, [trapca], Arusha Tanzania.
- NACTE (2010) *Procedures for Curriculum Development and Review*. National Council for Technical Education Dar es Salaam, Tanzania.

Oakley, P and Garforth, C (1985) *Guide to extension training*. Food and Agriculture Organization of the United Nations.

Potts, S. G., Biesmeijer, J. C., Kremen, C., Neumann, P, Schweiger, O. and Kunin, W. E (2010) Global pollinator declines: trends, impacts and drivers. *Trends in Ecology and Evolution* 25(6):345-53. doi: 10.1016/j.tree.2010.01.007

Sim, D and Hilmi, H. A (1987) *Forestry extension methods*. Food and Agriculture Organization of the United Nations, Rome. <http://www.fao.org/docrep/016/ap461e/ap461e00.pdf#page=147&zoom=auto,-17,786> Dec 24, 2018.

TCU (2014) *Quality Assurance: General Guidelines and Minimum Standards for Provision of University Education in Tanzania (2nd Ed)*. Tanzania Commission for Universities, Dar es Salaam, Tanzania.

URT (2013) *The Universities (General) Regulations*. Ministry of Education and Vocational Training, Dar es Salaam, Tanzania.

URT (2011) *The economic survey 2011*. President's Office, Planning Commission. KIUTA, Dar es Salaam, Tanzania.

URT (2002) *Beekeeping Act No 15 of 2002*. Ministry of Natural Resources and Tourism. Government Printer, Dar es Salaam, Tanzania.

URT (1997) *Act No 7 of 1997 to establish the National Council for Technical Education and to provide other matters related to it*. Ministry of Government Printers, Dar es Salaam, Tanzania.

URT (1998) *National Beekeeping policy*. Ministry of Natural Resources and Tourism. Government Printer, Dar es Salaam, Tanzania.

VETA (2013) *Procedures for Establishing a Vet Centre*. Vocational Education and Training Authority, Dar es Salaam, Tanzania.

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