
**Implementation Guidelines for
Electric Fencing System for**
(Wild pigs, deer, bear, monkeys, stray cattle)



**NATIONAL PLANT PROTECTION CENTRE
DEPARTMENT OF AGRICULTURE
MINISTRY of AGRICULTURE & FORESTS
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1 ACKNOWLEDGEMENT

The implementation guidelines for the Electric Fencing System (EFS) has been developed collectively by various stakeholders, and is expected to guide the users of the electric fencing system at different steps from the time of developing proposal to final implementation and monitoring of the system. This guideline is a living document and is subject to improvement. The guidelines reflect the Royal Government of Bhutan unwavering effort to contain wild animal's damage of Agricultural crops through systematic approach of fencing vulnerable areas with hope to minimize hardships faced by farmers guarding crops against wild animals.

The Electric Fencing System is a non-fatal method to guide crops against wild animals, which is especially important in the context of Bhutanese religion of compassion and non-killing and with the Philosophy of Gross National Happiness that advocate, among others, living in harmony with nature and its elements. Wild animals are part and parcel of nature, but when they come and raid crops it deprives farmers from their basic livelihood of food security. Thus, the middle ground where wild animals are not killed but prevented from entering agricultural field has to be found and the EFS represents this middle ground.

Finally, The National Plant Protection Centre (NPPC) would like to thank all stakeholders (Annexure 1) involved in developing and improving this guideline for establishing EFS.

2 INTRODUCTION

Crop damage by wild animals in Bhutan is primarily caused by wild pig, deer, bear, porcupine, elephant, monkey and stray cattle. Among them, the wild pig and elephant have overtaken all other wild animals' pest to become the overriding concern of the farmer.

Unable to deal with the situation and in desperation some farmers have abandoned farming and are seeking alternative sources of livelihood. From the government's side, the issues have been discussed and deliberated in many forums at all levels, and many options have been repeatedly discussed and experimented in the field on pilot scale. For example, snaring, culling, trapping of wild boars have been tried and proven successful in areas where they were tried.

The problem is that farmers are not willing to apply these methods on their own due to religious sentiments and also due to lack of resources. The other option experimented is to erect electric fencing system (EFS) in vulnerable areas to prevent wild animals entering farms to damage crops. After more than 5 years of testing in different location targeting different problem species of animals, the technology overall is proven to be successful.

The EFS is effective against stray cattle, elephant, wild pig and barking deer when there is constant supply of electricity and is maintained properly, but monkeys could find ways to enter the field despite electric fencing. Success of EFS depends on how such fencing is designed, installed, maintained and monitored against different wild animal species.

This model of electric fencing which includes imported energizers and locally fabricated fences is socially acceptable, safe and proven successful. The technology has also been approved by the Bhutan Power Corporation (PBC), Bhutan Electricity Authority (BEA) and Bhutan Standard Bureau (BSB) for implementation.

This guideline is therefore prepared to facilitate scaling up of the EFS technology. It is intended to widely promote the technology in major hotspot areas. The guideline elucidate roles and responsibilities of different stakeholders who will be directly involved in promoting and implementing EFS technology to mitigate human – wildlife conflict and in particular to prevent wild animals entering and damaging the agriculture crops.

3 OBJECTIVES

The objectives of the guideline are:

- To guide implementation of the EFS technology
- To develop procedures for implementation of EFS
- To create awareness on EFS including safety aspects
- To assign roles and responsibilities of different agencies to implement the EFS
- To monitor and evaluate effectiveness of the implementation

4 IMPLEMENTATION MECHANISMS

4.1 Identification of hot spot sites

- a) Dzongkhag should prepare initial lists of severely affected areas. These areas need to be verified by a team from Dzongkhag (RNR Sector) in consultation with the community.
- b) Based on the assessment, prioritized lists of area should be prepared as per the following criteria but not limited to:
 - Historical incidences of wild animals
 - Time and season of wild animals attack (priority should be given when attack occurs throughout cropping season)
 - Animal species involved and types of crop damaged including extent and severity of crop damages
 - Number of days guarding the crop

- Areas affected in acres
 - Susceptible crops
 - Remoteness of the farm from the main village settlement
 - Vulnerable entry and exit points of wild animals
- c) Need assessment including cost benefit analysis

4.2 Eligibility Criteria

- a) The beneficiary community or individual farmers should be willing to share costs for installation and management of EFS as laid out in section 4.3 of this guideline.
- b) Contiguous affected areas on community holding basis shall be given preference for installation of EFS. The beneficiary community shall mandatorily form EFS users group with agreed by-laws to govern the management of EFS as per section 5.10(a) of this guideline.
- c) Depending on the severity of problem, individual farmer, located in remote areas and near the forest fringes can also apply and are eligible for EFS but should be willing to share costs as per section 4.3 of this guideline.
- d) Community or individual farmer must fill in and abide by Indemnification Form of Bhutan Power Corporation (Annexure 2).

4.3 Cost sharing

The costs for the installation of EFS shall be shared between the Ministry of Agriculture and Forest (MoAF) and the beneficiary community/individual.

4.3.1 MoAF

The MoAF shall provide the following:

- a) EFS Equipment and accessories depending on the availability of fund

- b) Training of farmers on installation and maintenance of EFS
- c) Technical backstopping during initial installation and maintenance

4.3.2 **The community or individual farmer**

The community or individual farmer shall bear the cost of the followings

- a) Collection of fencing poles, transportation and pole erection
- b) Wage free labor during the installation of EFS
- c) Repair, maintenance and replacement of energizers
- d) Repair, maintenance and replacement of fencing materials

4.4 **Installation, repair and maintenance**

- a) Initial installation of EFS shall be done under supervision of trained RNR staff
- b) Beneficiary community and individual shall repair and maintain the EFS

5 **ROLES AND RESPONSIBILITIES**

To ensure successful implementation and installation of EFS and to ensure proper co-ordination amongst the stakeholder, the roles and responsibilities are as spelled out in the following:

5.1 **Department of Agriculture (DoA) shall:**

- a) Facilitate mobilization of resources (fund and trained manpower)
- b) Co-ordinate EFS activities with Human Wildlife Conflict Management Co-ordination Unit (HWC MCU) under Wildlife

Conservation Division (WCD) of the Department of Forests and Park Services (DoFPS) and Bhutan Electricity Authority (BEA)

- c) Ensure that electric fence activities are coordinated and monitored timely and properly.

5.2 Department of Forest and Parks Services (DoFPS) shall:

- a) Facilitate and support resource mobilization (fund and trained manpower)
- b) Facilitate assistance from Parks and Territorial divisions for implementation of EFS

5.3 National Plant Protection Centre (NPPC) shall:

- a) Co-ordinate implementation of EFS and shall draw up clear action plan
- b) Form a core team of trainers at the National Level in collaboration with RDC Yusipang and Wengkhar who shall conduct trainings to RDCs core team and the Dzongkhags staff
- c) Facilitate procurement of EF equipments (energizer, battery, charge controller and solar panel) in collaboration with regional offices of DoA, DoFPS and DoL.
- d) Provide specification for other EFS accessories (GI wire, nails, HDPE pipe, etc.) to Dzongkhag RNR sector.
- e) Ensure the quality of electric fencing technology up gradation and release in collaboration with Bhutan Standard Bureau (BSB)
- f) Facilitate electric fencing technology up gradation and release in collaboration with RDCs, BPC, BEA and BSB.
- g) Monitor and evaluate implementation of FES and report to the DOA.

5.4 Research and Development Centres (RDCs) shall:

- a) Identify focal persons for EFS
- b) RDCs shall form a core team for installation, monitoring and evaluation in their respective region
- c) The team shall conduct training of Gewog Extension Offices in their region including relevant staff from the Dzongkhag
- d) Provide technical backstopping to Dzongkhag and Gewog in the region as and when requested
- e) Create awareness in the region concerning electric fence and safety measures
- f) Monitor and evaluate implementation in their region and report to the NPPC
- g) Shall conduct R&D on human – wildlife conflict mitigation technologies

5.5 Territorial and Parks shall

- a) Facilitate and assist installation and maintenance of EFS
- b) Facilitate resources mobilization for implementation of EFS
- c) Facilitate issuance of permits for fencing posts
- d) Create awareness on electric fences and safety measures
- e) Monitor and evaluate EFS and report to HWCCU

5.6 Dzongkhag (RNR Sector) shall:

- a) Identify hotspots and problematic animal species
- b) Submit annual requirement of number of EFS energizers to NPPC to facilitate timely provision of energizers.
- c) Ensure that the Gewog Extension Staff and farmers get the necessary trainings from RDCs, Parks, Territorial Divisions and NPPC

- d) Ensure annual budget for implementation of EFS
- e) Procure EFS accessories based on technical specification provided by the NPPC
- f) Monitor implementation of electric fence activities and report to NPPC on annual basis
- g) Identify focal person for EFS

5.7 Dzongkhag/Regional Bhutan Power Corporation (BPC) shall:

- a) Process approval for use of electric power for EFS (Annexure 2: BPC- Application/Agreement form)

5.8 Gewog RNR Centres shall:

- a) Identify hotspots and problematic animal species
- b) Create awareness on electric fencing including safety among farmers and communities
- c) Assist in community consultation and formation of EFS users group
- d) Assist in need assessment of EFS and development of community EFS Bye – law
- e) Facilitate and assist installation of EFS
- f) Provide technical backstopping to farmers
- g) Monitor implementation of EFS and report to Dzongkhag

5.9 Local Government (Gewog Administration) shall:

- a) Initiate/facilitate community consultation
- b) Prioritize the hotspot areas and get it endorsed by the Gewog Tshogdue
- c) Mobilize and allocate fund for managing human wild life conflict management

- d) Take a lead role in mediating disputes settlements between and among communities and individuals related to EFS
- e) Endorse BPC- Application /Agreement Form (Annexure 2) for EFS powered by electricity
- f) Monitor electric fencing activities in the Gewog together with Gewog RNR staff

5.10 **User Groups /Beneficiariesl shall:**

- a) Draw up EFS Bye-laws
- b) Implement electric fence activities as per the Bye-laws
- c) Be responsible for maintenance and repair of electric fence as per the EFS Implementation Guideline
- d) Be responsible for replacement of energizers or its parts
- e) Initiate Application/Agreement Form of BPC (Annexure 2)
- f) Obtain all other necessary clearances for EFS establishment

6 **CO-ORDINATION OF HWC MANAGEMENT**

6.1 **Ministry level committee**

- a) Human Wildlife Conflict Management Co-ordination Unit (HWCMCU) under the WCD of DoFPS shall provide overall coordination
- b) As an when required, MoAF through Executive Order shall constitute a Task Force Committee to provide implementation policy and strategic guidance to HWCMCU

6.2 **Dzongmkhag Level committee**

The Dzongmkhag Administration shall form a committee and member shall constitute a following but not limited to:

- Dasho Dzongdag, Chairman
- Dzongkhag Agriculture Officer, Member Secretary
- Dzongkhag Forestry Officer, Member
- Dzongkhag Livestock Officer, Member
- Chief Forestry Officer, Territorial Division/Protected Areas, Member
- BPC Regional Manager/In-charge, Member

6.3 **The terms of Reference of the *Dzongkhag HWC Committee***

- a) Ensure availability of fund through annual budget provision
- b) Review the prioritized hotspot areas submitted by the Gewog Tshogdue
- c) Facilitate implementation of EFS according to the prioritized lists and availability of fund at the Gewog and Dzongkhag
- d) Facilitate application process for EFS to respective agencies for fund support
- e) Monitor the implementation of EFS
- f) Address any other issues related to the implementation of EFS and HWC

7 **PROCEDURES FOR SUBMISSION OF APPLICATION**

- a) The community/individual shall propose requirement for EFS to the Gewog Administration
- b) The Gewog Administration in collaboration with RNR Extension Officers will conduct assessment as per the section 4, of this guideline and submit to the Dzongkhag.
- c) Based on the feasibility of the EFS installation, the Gewog Administration shall initiate Users Group Formation, development of Bye-laws and other procedural requirement

- d) Upon fulfilling all the requirements, Gewog Administration and Dzongkhag Administration can directly procure energiser from NPPC or Authorised dealers for implementation
- e) Private individual and community who want to procure energizers privately can directly purchase from Authorised dealers. However, implementation should follow the normal procedures of this guideline including the Technical Reference Manual for Installation and Maintenance of Electric Fence
- f) In case of non availability of fund at the Dzongkhag, the Dzongkhag will compile and forwards the application to potential funding agencies

8 MONITORING AND EVALUATION

- a) Monitoring shall be carried out at different levels as prescribed under Roles and Responsibility of this guideline and submit report to the NPPC on annual basis
- b) If necessary, NPPC will develop a reporting format including evaluation and impact assessment.

ANNEXURE 1: EFS IMPLEMENTATION GUIDELINE MEMBERS

- 1 Dr. Thinley, Plant Protection Specialist, NPPC, DoA
- 2 Mr. Chimi Rinzin, Chief Agriculture Officer, DoA
- 3 Mrs. Yeshey Dema, Program Director, NPPC, DoA
- 4 Mr. Jigme Wangdi, Specialist, RNR-RDC, Yusipang, DoFPS
- 5 Mr. Tshering Penjor, Principal Research Officer, RNR-RDC, Wengkhar, DoA
- 6 Mr. Tenzing Drugyel, Dy. Chief Agriculture Officer, DoA
- 7 Mr. Kinley Rabgay, Sr. Forest Officer, WCD, DoFPS
- 8 Mr. Kiran Mahat, Sr. Plant Protection Officer, NPPC, DoA
- 9 Mr. Jigme Tenzin, Sr. Plant Protection Officer, NPPC, DoA
- 10 Ms. Tshering Zam, Forest Officer, WCD, DoFPS
- 11 Mr. Tshewang Norbu, Sr. Forest Ranger II, RNR-RDC, Yusipang, DoFPS
- 12 Mr. Sonam Dorji, PPSII, NPPC, DoA
- 13 Mr. Lhendup Dorji, PPSI, NPPC, DoA

ANNEXURE 2: BPC – APPLICATION /AGREEMENT FORM FOR EF

**Bhutan Power Corporation Limited
Distribution and Customer Services Department**

APPLICATION / AGREEMENT FOR ELECTRIC FENCING

Date:.....

The Manager
Electric Services Division,
Distribution & Customer Services Department

Sir/Madam,

We would like to request for the electric fencing connection at the location described below:

(a) District:_____ (b) Geog:_____

(c) Village:_____ (d) Name of area:_____

(e) Approximate length of fencing in meter:_____

We hereby declare that the Company's Terms and Conditions of Supply of Electricity including the Schedule of Tariffs and Miscellaneous Charges have been read by me/us and I/We agree to be bound by all the terms and conditions laid in here.

I/We assure that all the information filled in above by me/us are true and that we are liable for any action by the Company as per sub-clause 4.2 and 25.2 of Low Voltage Terms & Condition, if any of the information filled in are incorrect.

I/We hereby declare that through this Agreement, Bhutan Power Corporation Limited (BPC) shall be indemnified, and hold harmless from any and all actual or alleged claims, demands, causes of action, liabilities, loss, damage and or injury (to the property or to person including without limitation to death) resulting from electric fencing and its accessories.

Name: _____

ID Card Number: _____

Mobile No. _____



Signature of the Customer

[For the group fencing, name and signature on the legal stamp by all the group members must be attached separately]

I. TO BE COMPLETED BY THE CONCERNED GUP

The area identified by the above applicant/applicants for electric fencing is registered under Tharm number:_____,
Village:_____, Geog:_____

Dzongkhag:_____

The Geog office declare that BPC shall be indemnified, and hold harmless from any and all actual or alleged claims, demands, causes of action, liabilities, loss, damage and or injury (to the property or to person including without limitation to death) resulting from electric fencing and its accessories.

Signature and seal of Gup

AI. RECOMMENDATION BY THE CONCERNED RNR EXTENSION OFFICER

(Tick appropriately)

ELECTRIC FENCING IS: REQUIRED ☐ NOT REQUIRED FOR THE ☐
INDIVIDUAL/GROUP

If electric fencing is installed for the above Individual/Group, BPC shall be indemnified, and hold harmless from any and all actual or alleged claims, demands, causes of action, liabilities, loss, damage and or injury (to the property or to person including without limitation to death) resulting from electric fencing and its accessories.

The electric fence energizer conforms to the approved specification as per Bhutan Electricity Authority (BEA) approval no. BEA/CEO/COM/2011-12/3097 dated June 28, 2012

The applicant/applicants electric fencing systems was inspected and found to be (tick appropriately)

☐ Satisfactory ☐ Unsatisfactory for lease of electric supply

Signature and seal of Agriculture/Forest/Livestock Officers

BI. **TO BE FILLED BY THE BHUTAN POWER CORPORATION LIMITED**

The electric fencing shall be connected from:

Meter Number :

Consumer number:

Meter Type & Category :

CT ratio of meter (If CT Oper-
ated)

The electric wire connection to the electric fencing energizer and earthing system was checked and found to be (tick appropriately)

☐

Satisfactory

☐

Unsatisfactory for release of electric supply

Verified by:

(Name and Signature of Supervisor/Engineer)

(Name and Signature of Manager/In-charge with official seal)