

## Department of Science & Technology

### Details of Technology Development & Transfer from DST supported Projects/Activities

**Division: SEED**

**Name of Scheme/Programme: CORE**

**Total Fund support by (i) DST: Partial (ii) Industry (if Any): None**

**Name & Address of PI/Co-PI:\* Dr Sejal Worah (PI) & Ms. Vishaish Uppal (Co-PI)**

**WWF India, 172 B, Lodhi Estate, New Delhi - 110003**

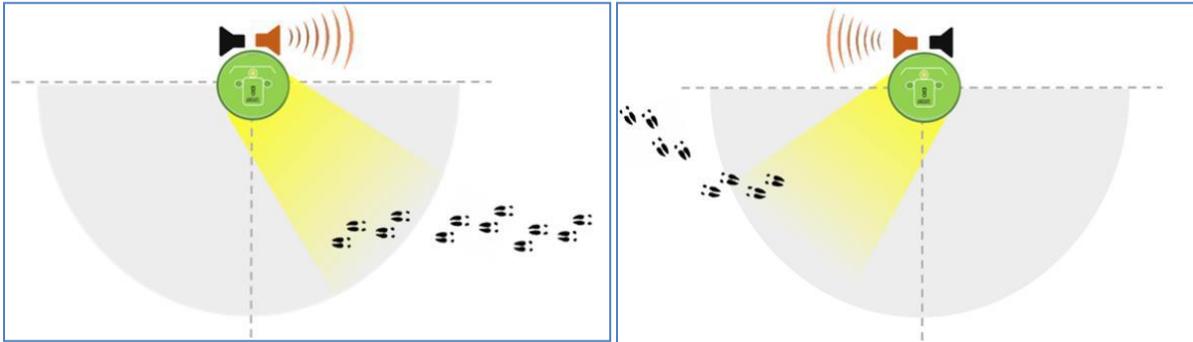
**1. Title of Technology / Product developed or under development**  
**PROCESS: Animal Intrusion Detection and Repellant System (ANIDERS)**

**2. Brief write-up (1/2 page):**

One of the biggest challenges faced by farmers residing in the vicinity of Protected Areas (PAs) and other forest areas even is the loss of crops to wild herbivores including wild elephants. In some areas local communities have even given up farming. The development of low cost Early Warning Systems that either provide timely information to farmers or scare wildlife away is therefore necessary and has been taken up by several developers; individuals, scientific institutions and non-government organizations. ANIDERS was conceptualized by Mr. Abhay Sharma from Kyari, Nursery of Innovations, Ghaziabad. WWF India has worked closely with him to develop ANIDERS to make it an effective deterrent to wild herbivores. Two types of early warning and animal scare systems have been developed

Type 1:

One of the systems is a passive Infra-red (PIR)based unit, which is an improved version of a previous similar system developed after inputs from WWF's field trials on its efficacy and effectiveness using camera trap data. The system in its current form uses two PIR sensors to detect the presence of mammals in an approximate 15 m. range on forest-farm boundaries and generates a response in the form of an alarm of multiple sounds and LEDs. As each sensor provides a 90 degree coverage, the device therefore secures a 15 m. radius of 180 degrees around it against crop raiding by herbivores like elephants, wild boar, spotted deer, sambar, nilgai among others and also detects and drives away carnivores like tigers and leopards



#### Type 2:

The second system is an active Infra-red based system which is a combination of two type 1 units placed at two ends, acting as a single strand virtual fence of length upto 100 m. The two units at both ends also act as standalone PIR units as explained above. Additionally, together one of them acts as an emitter of Infra-red waves and the other as a receiver. When the device is on, the receiver continuously receives IR from the emitter and as and when a mammal breaches this virtual fence the receiver stops receiving the IR from emitter, which triggers the alarm and LED.

### 3. Details(including Photographs etc.)

Each device uses a 12V PIR sensor,12V 2.2Ah Battery, SPV of 12V 20 Watts, Microcontroller, PCP ( for LED blinking pattern, change of sound, auto switch on and low battery signaling programmed),LED 3-4 Watts.

### 4. Transferred to Industry (if Yes, Name & Address of the Industry):

KYARI has applied for patent for a higher specification version of ANIDERS which will be a more complicated technology. The current technology and functionality is envisioned to be disseminated to farmers at scale.

### 5. Institutions/ Industries involved in the project:

Kyari, nursery of innovations and WWF India as co-developer for Human Wildlife Conflict related application of the device

### 6. Stage of development (Tech Transfer, Demonstration, field trial, etc. in next 6-12 months) Approximate Technology Readiness Level (TRL)

Type1: Field Trial completed for initial design. Field testing is underway for modified design. Lab testing for further improvement to the range and coverage and to bring down the size and price is on.

Type2: Field testing underway

## 7. Further development required (If same group can do it or industry partner is required to get the product/technology in a final form suitable for commercialization)

After the first level field trials of two units , 19 improved units of Type 1 system and 3 units of new type 2 units are being trialed at different WWF-India field sites. The system can be improved further to cut down cost and enhance design, which is under progress.

## 8. Comparison with available technologies:

There are different devices available for repelling and deterring animals available online some of them are available for purchase for India as well and some local dealers of solar products procure them from international markets and sell them in India, at very high prices. There are companies like Spypoint, Signstek from US and UK making such products that typically make use of motion sensors of different ranges, LEDs, different sounds that can even be customized in case of a device called Soundbox by Spypoint. The cost of such devices renders them infeasible to be used at a large scale. Some of them cost upto 30-40 thousand INR. There are ultrasonic sound based devices as well, costing from around Rs. 1400/- to Rs. 9000/-. The potential impacts of ultrasonic on wild animals need to be understood properly before introducing them to farmers at scale. The range and coverage of the systems costing below Rs. 5000/- are limited to 5 to 8 meters. Some of such devices are produced by Signstek UK and can be purchased in Indian markets from specific dealers.

There are also local developers trying basic sensor based systems, some trying to develop laser based systems. That would be a comparable system to ANIDERS Type 2, which is AIR based. In this case, laser instead of the IR acts as a virtual fence and the breach triggers response. In some cases there is no clear pricing of these devices so far. The challenges with Laser devices are that they need high precision, are hard to install and are sensitive to rough weather conditions.

ANIDERS is a robust device, with sensors ranging upto 15 m and covering 180 degrees. It is a work in progress envisioned to be drastically cheaper and more extensive in coverage. It is very easy to install and farmers could be trained and enabled to develop it on their own with some support from the developers.

## 9. Approximate cost/ Economics (for the user e.g. buy-back period):

The type 1 system costs Rs. 9500 and Type 2 costs 22000.

The current work by the developer is focused on reducing the cost of these units by half and making design more compact. The type 2 system would cost only around 40% (approx. Rs.104500) of the per km cost of robust solar fence designs available in the market (approx. Rs. 300000 per km)

#### **10. Contact Persons for further details:**

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