

# Florican-Friendly Agricultural Practices

## The ultimate way to the conservation of Lesser Florican in The agro-pastoral landscape of Ajmer-Kekri, Rajasthan



**Draft Final Report**

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**Submitted to Trident Pneumatics**



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# **Florican-Friendly Agricultural Practices**

## **The ultimate way to the conservation of Lesser Florican in The agro-pastoral landscape of Ajmer-Kekri, Rajasthan**

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## Contents

Abbreviations .....	4
Background and concept.....	5
Introduction.....	5
Population status.....	6
Distribution of lesser florican in India .....	7
Past distribution.....	7
Present distribution .....	7
Habitat status .....	7
Threats to Lesser Florican and the need for habitat protection .....	7
Major concern – effect of intensive agriculture on breeding birds.....	8
Rationale about need of Florican Friendly Agricultural Practices (FFAP).....	9
Aim & Objectives.....	10
Aim.....	10
Objectives .....	10
Duration .....	10
Study Area .....	11
Intensive Study Area .....	11
Extensive Study Area.....	11
Methods.....	13
Objective 1: Network building, capacity training, and monitoring .....	13
Objective 2: Develop a model for Florican-Friendly Agricultural Practices.....	13
Socio-economic surveys.....	14
Expected Outcome.....	15
Collaborating with an NGO to mitigate threats .....	15
Results .....	16
A) Understanding the birds and their status through field surveys.....	17
Key points noted during the survey .....	18
About bird sightings.....	18
Threats observed.....	19
B) Engagement with Farmers .....	20
Understanding cropping pattern.....	20

Understanding the perspectives of the farmers .....	20
Additional surveys done at Ratakot a grassland maintained by Forest department .....	22
Outreach programmes.....	23
1) At the Government school, Shokaliya .....	23
2) At Hingoniya-Siyar .....	23
Feedback of the Outreach programmes.....	23
Discussion .....	25
References .....	26
Acknowledgment.....	27
Glimpses and photo documentation.....	28

### **Abbreviations**

FFAP - Florican Friendly Agricultural Program  
 LF - Lesser Florican

## Background and concept

In 2017 after the project proposal got sanctioned by Chief Wildlife Warden (CWLW), Ajmer, BNHS started working on this project to conserve the species from the verge of extinction. Since then, till now with support of BirdLife International under Prevention Extinction Program (PEP) BNHS collecting data regarding its status, distribution, behaviour, habitat etc. with the help of local communities and the forest department. The distribution of LF depends on the rainfall pattern and found visiting the study area in peak monsoon, which is a short window period of five months from July to November. The species was found in low numbers and, distributed patchily across the huge landscape.

Based on breeding bird sighting locations, using Google Earth imagery and field surveys, BNHS tried to identify potential areas that could be managed as Community Conserved Areas (CCAs) under a long-term strategy. Similarly, data about reserve forests, potential florican habitats, and mining operations in the adjoining sites were collected to map the areas considered CCAs. During the 1990s, there were around 55 Great Indian Bustard (GIB) reported in this landscape, which reduced to 4 birds in 2016 and, unfortunately, no confirmed sightings thereafter. It is hoped that the LF will not go the way of the GIB. Floricans were mainly seen in the croplands as most of the common grazing or pasture lands are now full of *Prosopis juliflora*, unsuitable for the species. Areas with traditional crops like *Jowar*, *Moong*, and *Urad* growing up to a height of 50–100 cm were seen as preferred by the birds. Disturbance due to mechanical operations while farming, widespread use of chemical fertilizers/pesticides, and overgrazing in *kankads* (common grazing lands) were observed as major threats to the breeding of birds. Uncontrolled tourism, increase in free-ranging dogs, land use changes, chemical spray, and unavailability of grasslands were found some of the important threats to be addressed immediately.

Therefore, we aim to establish an incentive-based land-sparing model for farmers. When any individual of LF is found to use agricultural land intensively or its nest is found, 'Florican Friends' will approach the farmer to stop further agricultural activities on the concerned portion of the farm. Incentives was discussed with the farmer to be disseminated at the end of the season based on the area of the land the farmer spared and the market price of the crop of that particular year. Farmers who accept florican friendly agricultural practices and/or spare lands for LF was felicitated at a program that was organized at the end of each breeding season. The expected size of land to be spared is 1 - 2 bighas (0.5 to 1 acre) by each farmer and a minimum of 100 farmers are expected to avail of this scheme. This incentive scheme will further encourage people to be a part of this project. In the year 2022 around 20-25 farmers have been identified to get enrolled under the scheme.

## Introduction

The smallest bird of the bustard family found in India was formerly a common game bird of Indian grasslands. But now with a global population of 250-300 males (Dutta et al. 2018) confined in the states of Madhya Pradesh, Gujarat, Maharashtra, Karnataka, Telangana, Andhra Pradesh, and Rajasthan with an IUCN status of CR (Critically Endangered). The Shokaliya landscape of Rajasthan is one of the last remaining breeding grounds for this bird and here the bird is surviving in a human-dominated landscape (Narwade et al 2020). The breeding season of lesser Florican starts at the onset of the southwest monsoon, with the males attaining the breeding plumage in the months of June and July (Sankaran and Rahmani 1986). They prefer elevated patches on the ground or small ridges to perform their display (Sankaran 1991, 93, 94); establishing territory mainly depends upon the height of the grass. According to Magrath et al.

(1985) and Sankaran (1994), the bird follows a lek mating system in which no pair bonds are formed. Lesser Florican is not a sociable species; the male and female do maintain a separate territory. It is not as shy of humans as the Bengal Florican is. Males set up territories in one- to the two-hectare area, and the territorial boundaries are set up at 200 to 500 meters distance (Sankaran 1994, 1995). Males display from a particular spot within the territory (Sankaran and Rahmani 1986). At one given time, 3-5 territories were observed within an area of one sq. km (Sankaran 1994). Females nest outside the territorial range of the male.

The bird is an irregular local migrant, behaving nomadic during the SW monsoon. It remains confined to the plains and open areas (Hume and Marshall 1879). Post breeding period, most of the birds from Rajasthan, Gujarat and Madhya Pradesh migrate to peninsular India (Dharmakumarsinhji 1950). Earlier, the major breeding grounds were in eastern Haryana, Nasik and Kathiawar peninsula (Goriup and Karpowicz 1985), but these grounds have shifted to southern Rajasthan, western Madhya Pradesh and southern and eastern Gujarat (Sankaran 1991, 94). Its movements in the non-breeding period have been poorly reported, with uncertain migration towards the Terai region, West Bengal, and Odisha. According to Dharmakumarsinhji (1950), the breeding Florican in Saurashtra and Kutch arrives from peninsular India. He also noted that the Florican arrives on the east coast of Saurashtra from the direction of Gujarat and Bombay by crossing the Gulf of Cambay. Satellite tracking of two male Lesser Floricans in 2014 by WII revealed that males could shift their territories within an area (Mohan et al. 2016). It was earlier believed that Lesser Floricans are long-distance migrants, and their foraging grounds might be in the Western Ghats and Gangetic Plains (Sankaran 2000). Both breeding and non-breeding habitats of the Lesser Florican are semi-arid grasslands that are under immense human-induced pressure. It requires connected grasslands or agriculture/fallow lands for migration (WII final report 2017). Its movements in the non-breeding period have been poorly reported, with uncertain migration towards the south in the Deccan plateau (Maharashtra, Telangana, Karnataka, and Andhra Pradesh). A recent satellite transmitter study revealed that LF migrates around 1000 to 1500 km distance from Southern India to the North-west part in monsoon and again back during the non-breeding season in winter, making around 3000 km cyclic movement (WII report 2022). LF shows strong site fidelity and therefore it is essential to provide them safe breeding habitat during short window period of monsoon and early winter (for chicks, juveniles and mothers).

### Population status

In the 1980s and early 1990s, extensive surveys were conducted by the BNHS and later by SACON (Sankaran 1991, 1994, 1996, 2000, Sankaran et al. 1992). Its estimated population density was 2187 males in 1982, which declined by 60 percent to about 836 males in 1989, 1103 in 1994 which went up to 1765 (32% increase) in 1999. While estimating the population, Sankaran (1991, 2000) considered the proportion of the grasslands and breeding ranges to calculate the population density of displaying males. In August 2010, a survey was conducted in areas where previously surveys were conducted by Sankaran (2000), and a sharp decline of almost 65% of the population was seen in the areas of Rajasthan, Gujarat and MP, (Bharadwaj et al. 2011). During recent surveys conducted jointly by BNHS, WII, TCF and state governments, the global population estimation has been given 300 to 600 males (Dutta et al. 2018). 34 males and 9 females were sighted in Ajmer-kekri region. (BNHS Report 2020).

## Distribution of lesser florican in India

### Past distribution

The Lesser Florican is endemic to the Indian subcontinent. As indicated earlier, it was once widespread and common, but now breeds in a few areas in Gujarat, south-east Rajasthan, north-west Maharashtra, and western Madhya Pradesh. There is some dispersal to southeast India in the non-breeding season. It was once abundant in Terai region of Nepal but now is seen in the area quite rarely. It has also been sighted in Pakistan and is a vagrant in Bangladesh. These population fluctuations are directly correlated with rainfall patterns and breeding season. They indicate that it is susceptible to extinction in the event of severe, prolonged drought.

### Present distribution

Currently, Lesser Florican breeding range is restricted to Gujarat, southeast Rajasthan, northwest Maharashtra, Kurnool district of Andhra Pradesh and western Madhya Pradesh (Dutta et al. 2018).

1. Rajasthan: a) Shokaliya Florican landscape, Ajmer, Rajasthan; b) Adjoining areas of districts Bhilwara, Tonk, Jalore, Pratapgarh
2. Gujarat: a) Velavadar Blackbuck Sanctuary and adjoining areas of Bhavnagar; b) few sites in Surendranagar, Amreli, Rajkot, Junagarh of Gujarat
3. Madhya Pradesh: a) Sailana WLS, Ratlam; b) Sardarpur WLS, Dhar; c) Petlawad, Jhabua; d) Jiran, Neemuch
4. Andhra Pradesh: Rollapadu WLS
5. Maharashtra: a) Akola and b) Washim districts
6. Karnataka: Bidar

## Habitat status

The Lesser Florican occurs in dry grasslands with scattered bushes, scrub, and to a lesser extent in tall crops of millet and cotton. Sufficient grass cover is particularly important during the breeding season. Large trees with big canopy are not desirable in the florican habitat (Magrath et al. 1985). The Lesser Florican forage, rest, display and breed in plains and undulating grasslands (Magrath et al. 1985; Sankaran and Manakadan 1990). It does not inhabit hills, wetlands, marshy lands, dense forests, extreme deserts, and barren lands. It is regularly found in agricultural fields where crops of millet, cotton and some cereals are cultivated (Sankaran 1991). Its presence has also been marked in grassland habitats within forest plantations.

## Threats to Lesser Florican and the need for habitat protection

Florican habitat has been lost because of land use changes caused by an increase in agriculture, changes in crop patterns, encroachment of grasslands, inadequate grassland management, and rapid infrastructure development. One of the primary causes of habitat loss for this species was mining, particularly opencast mining. Grasslands, unlike forests, are rarely protected and are frequently seen as wastelands. They are used for a variety of purposes, including afforestation – as compensation sites for areas that have been lost or drowned because of a development project, to restore forest cover, and to establish fuel wood or medicinal plant plots. This not only takes up grassland, but it also fragments the habitat and causes a visual disturbance to Lesser Floricans, as well as causing the loss of excellent nesting grounds.

Because the Lesser Florican is a monsoon breeder, it alters its breeding areas depending on monsoon conditions, making its conservation more challenging. Climate change and unpredictable rainfall in several sections of its distribution range have caused it to vanish or

emerge seldom in previously visited places. All these constitute further push this highly versatile species into adapting to new strategies, technically a grass, *Jowar*, and food-rich moong crops are now new breeding grounds for the species, also overgrazing has resulted in the loss of grasslands with higher chances of the trampling of florican eggs, now agricultural fields are hosting most of the population. Heavy machinery now proving to be more harmful than tampering with cattle raises deep concern. Research on the ecology, behavior, and habitat requirements of the Lesser Florican is currently restricted and needs to be expanded and a participatory conservation approach needs to be developed.

### Major concern – effect of intensive agriculture on breeding birds

According to the Census of the India 2011 District Census Handbook Ajmer, villages Shokaliya, Shokli, Madhopura, and Piproli have 3679.8 ha of total area, out of which agricultural land is 2321.3, constituting total land and grazing land just 16.8 % (Directorate of Census Operations, Rajasthan 2011). This clearly shows the amount of natural habitat left in a single Gram-panchayat but also gives hope for Lesser Florican surviving in farmlands (Directorate of Census Operations, Rajasthan 2011). With modern agricultural development, the problems of pesticides are also getting bigger. Strong pesticides and herbicides are used instead of regulations. It was seen that farmers were using poison for food crops. This can be harmful to the bird, indirectly affecting its organs from the poison from insects it eats, and can cause thinning of eggs like in the case of Sparrowhawk in the UK (Wilson and Bradbury 2015). It is seen that Lesser Florican usually avoids the areas where the pesticide is sprayed for some days until it fades. While birds can tackle the issue of pesticides by shifting their sites, the problem of the use of heavy machinery can result in direct mortality. Females stay with the chicks in the tall crop and get trapped resulting in the death of Floricans. Casualty like this happened and unveiled the problems occurring in the second phase of the *Kharif* season when heavy machinery use killed three birds in 2022.



*image 1 A female Lesser Florican mortality due to harvesting machine in October 2022*

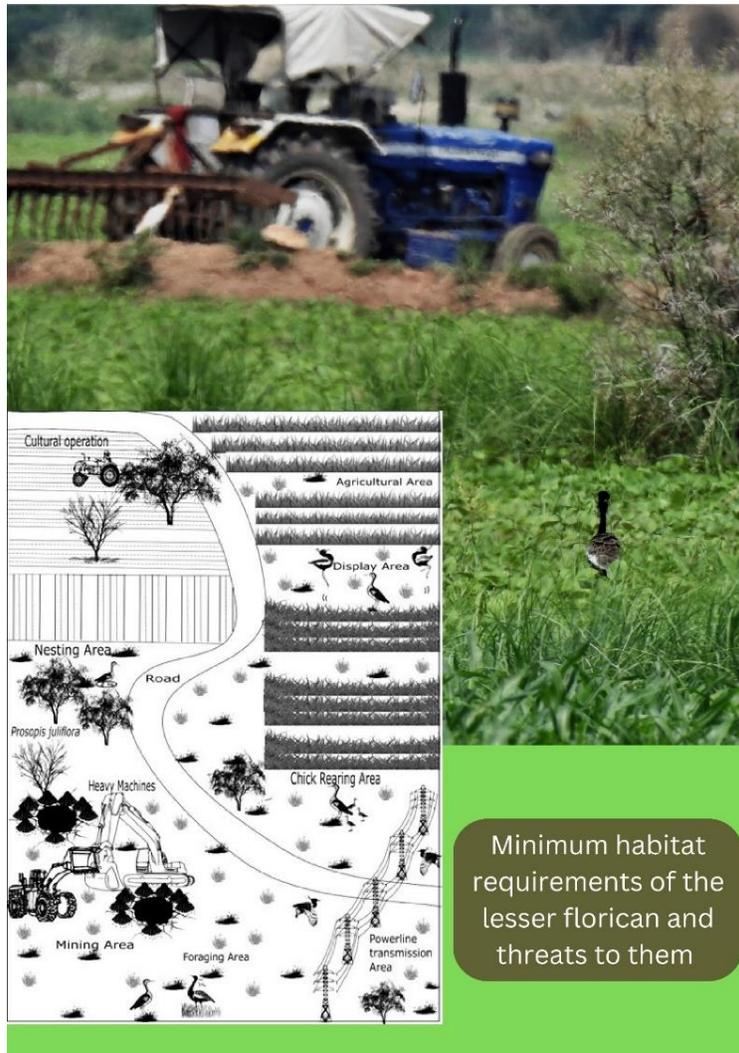


Figure 1 Showing various threats to LF in their habitat

### Rationale about need of Florican Friendly Agricultural Practices (FFAP)

Land ownership and conservation are two aspects that run hand in hand with each other. If there is no community or conservation reserve established across the landscape slowly the land use change will affect the last remaining population of the florican. In Cambodia, the Wildlife Conservation Society (WCS) at Tonal Sap Lake floodplain, worked on agricultural land and local villages. Protected areas were set up in 2010 as *Bengal Florican Conservation Areas* covering 312 km<sup>2</sup> of breeding and non-breeding areas. In 2011 nest success was higher by 18% due to a nest protection scheme introduced for the conservation of breeding population under threats, reducing disturbances to incubating birds. Payments as bonuses on success of nest were given (Mahood et al 2007).

Promoting florican friendly agricultural practices will provide a solution for land management and can provide safe areas for the breeding of the floricans. Evidence-based Agri-Environment management for bird conservation was the basis for this approach and predicted this strategy [Agri-environment schemes being implemented by The Royal Society for the Protection of Birds (RSPB) – RSPB 2022 <https://www.rspb.org.uk/our->

[work/conservation/projects/monitoring-of-agri-environment-schemes/](#)]. During the last five seasons, it was observed that threats are continuously emerging and are affecting the activities of LF but threats like heavy machinery are considered as high risk because it gives no second chance to this ground-nesting bird. In previous years often eggs of birds including LF were seen crushed by heavy machinery, so in upcoming years it is expected to cause much damage.

It is considered to be the last phase of the season for Lesser Florican because after surviving through this time, it can fly back to its non-breeding grounds. To raise its chicks into flying adults it needs the landscape to feed, take shelter, and look after its young ones and if it fails in this stage the whole process gets wasted. To mitigate the threat immediately steps were taken from our side, regular monitoring was done to find out the population remaining in the late season. Lesser Floricans were seen with their chicks successfully breeding in the crop fields which were left behind as cattle feed, usually kept until retreating monsoon shed the last showers, then immediately harvested for nest crop.

This quick response is very dangerous for the bird as in one or two days all fields are stripped down into the bare ground. With no healthy Kankads (village commons which are grassland, with sparse trees and shrubs vegetation) around it leaves no place for the bird to move into. It was seen by our team that Lesser Florican after this situation takes shelter into nearby Kankads, but comes back during the day several times for reasons we are unaware of. Protection measures like buying a single crop field were not enough to protect at that time, but this method has been used in Europe in the case of ground-nesting Sky Lark. Conservationists left small patches of bare ground in crop fields for nesting. It gave magnificent results as in one farm doubling the number of nests (Donald *et al.* 2005).

Focus on Florican Friendly Agricultural Practices (FFPA) is on priority to be tested the pilot program and develop a model for successful implementation. During the first phase of the season when the bird arrives the crops are sown and disturbances occur all through the stages, spraying of chemicals, changing crop pattern and free-ranging dogs in fields making it more difficult for the conservation of the bird. To understand each and every cause, detail monitoring at this stage is important and where the bird is present, an immediate response should be given. The community should be informed and the area should be secured.

## Aim & Objectives

### Aim

To secure the last remaining population of Lesser Florican in its breeding grounds of Shokaliya landscape, Ajmer, Rajasthan through community support.

### Objectives

1. Network building, capacity training, and monitoring of farmers in Florican areas
2. Develop an incentive-based land-sparing model for florican friendly agriculture practices

## Duration

Reporting period - 1<sup>st</sup> January 2023 to December 2023 (12 months)

## Study Area

### Intensive Study Area

Ajmer covers an area of approximately 8481 sq. kilometers and Aravali Mountain Range surrounds it. The district is bounded by Jaipur in northeast, Tonk district in the east, Bhilwara and Rajsamand districts in the south, Pali district in the west and Nagaur in the northwest. It stretches between 25° 38' 48.84" to 26° 58' 42.97" North latitude and 73° 53' 48.20" to 75° 21' 22.73" East longitude (District wise Atlas). The average rainfall in the district is around 430 mm. The climate is semi-arid; from April to June, the district faces hot dry summers, with a mean temperature every day of max. 39.4 °C and min. 26.9 °C.

The prominent geographical feature is the Aravalli hill range that runs through the district. It forms one of the great water divides of India; so, rivers and streams west of Aravalli drain into the Arabian Sea while those east of it pour their waters into the Bay of Bengal. The rain that drops in the southern part of the district drains into Chambal. The rivers are severe in nature and flash floods are common in the monsoon; the Khari and Dai rivers pour their water into the Banas River. (BNHS report 2020)

The Kekri (25.97° N, 75.15° E) forms the southeastern part of the district. It is 90km away from the Ajmer City. Before Becoming a district, it was one of the sixteen tehsil of the Ajmer. The total area of kekri is 1006.06 sq. Kilometers (Census India 2011). The two rivers constituting the drainage system of these tehsils are Dai and Khari. Being a semi-arid region, the landscape is mainly dominated by xerophytes; some of the grasses found in this area include *Cenchrus ciliaris*, *Sehima nervosum*, *Dichanthium annulatum*, *Chloris brabata*, *Dichanthium foveolatus* while *Senegalia catechu* (Khair), *Acacia nilotica* (desi Babul) and *Anogeissus pendula* (Dhok) are some of the common tree species. Types of soil found in the district are Sandy Soil, Mountainous Soil, Red Yellow Soil and Black Soil. Black Soil is exclusively found in Sarwar tehsil and some parts of Kekri (BNHS report 2020).

### Extensive Study Area

It is a mosaic of open grassland and crop fields

1. Shokaliya-Sanod-Kesarapura: 13.8 sq. km of common grazing land covered with more than 60% of invasive exotic trees *Prosopis juliflora*. One of the strongholds of Lesser Florican
2. Madhopura-Bhagwantpura: Common grazing land of 6.25 sq. km with mainly kair and native plants surrounded by traditional crop fields..
3. Bhatiyani-Kumhariya: Grazing land of 7.49 sq. km, mainly traditional crops interspersed with sparse grasslands.
4. Kalyanipura-Kitap: Area of 6.39 sq. km sandwiched between villages on boundary the of Tantoti and Bhinai tehsils, south to Shokaliya.

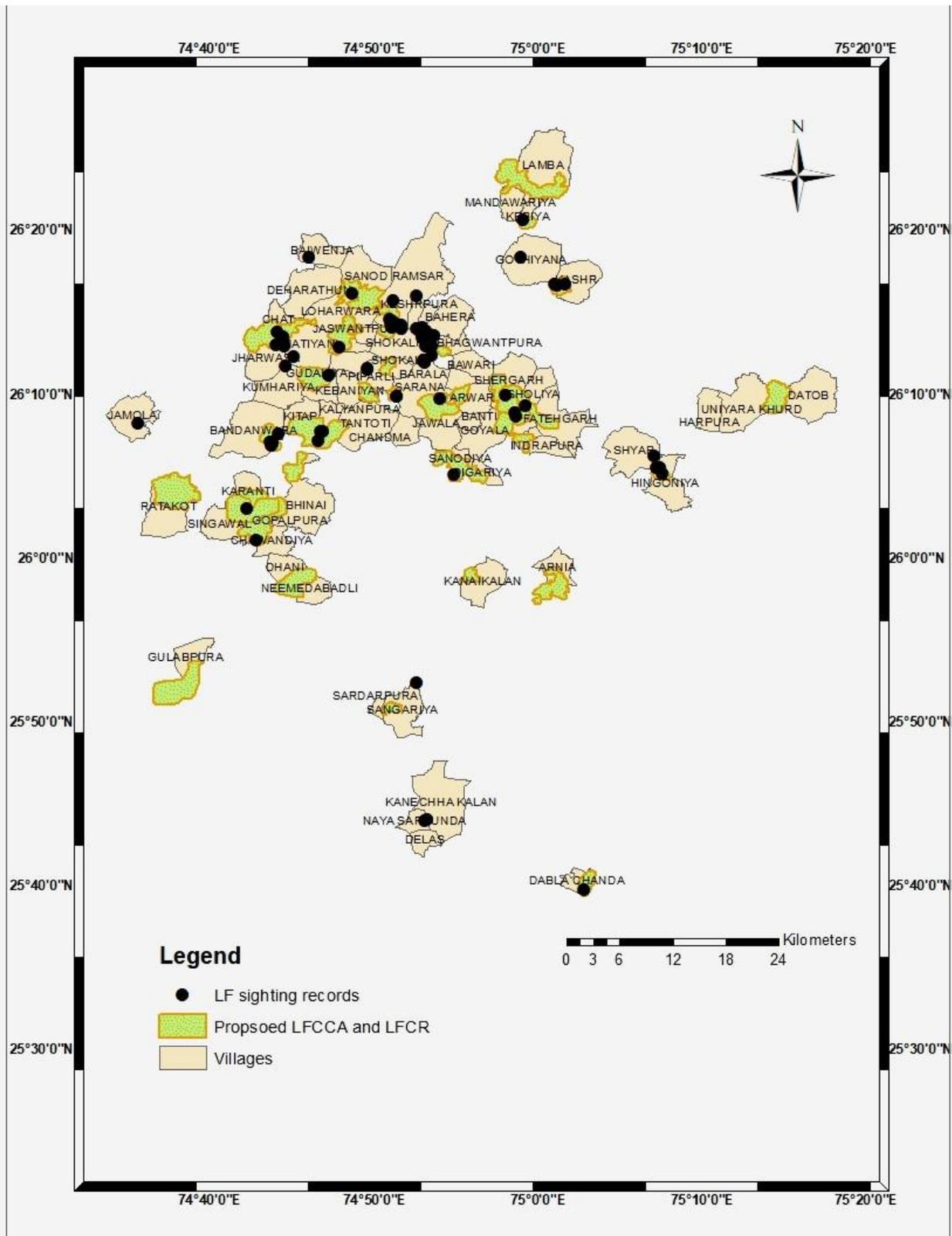


Figure 2 Map Showing Distribution of LF in Ajmer District, Rajasthan.

## Methods

### Objective 1: Network building, capacity training, and monitoring

1. Reach out to the list of farmers in areas where Lesser Florican has been seen, especially from lek sites
2. From other florican sites more farmers to be selected
3. Capacity building of staff, volunteers, and field assistants. sensitization for approx. 200 farmers to develop interest and to explain FFAP.
4. Enrollment of farmers into the FFAP program based on 1. Presence of Lesser Floricans in their crop field 2. Willing to become a part of program 3. Ready to reduce the chemical load in crop 4. Ready to spare at least 1 bigha (0.6 acres) land under FFAP
5. Out of the enrolled participants of the FFAP, a couple of *Kharmor Mitra* (volunteers) to be selected and necessary training to be provided for monitoring the birds

### Objective 2: Develop a model for Florican-Friendly Agricultural Practices

1. Landscape survey, to be monitored for active sites and finalization of 100 farmers based on sighting and area usage by birds.
2. Mapping of the locations.
3. Explaining FFAP to selected farmers and paying incentives as first installment before sowing (in June) and the second after harvesting (in November - Diwali season).
4. Weekly monitoring – for assessing the a. status of land and vegetation b. presence of birds and their activities c. Ongoing activities of farmers e.g., chemical use, machine use 4. Maintain a farmer's diary for detail was done.
5. Interventions for protection, where the Lesser Florican nests are found.
6. Based on the evaluation minimum of Rs. 3000/- incentive per bigha (0.6 acres) per farmer to be paid (~100 farmers and while the number and the exact amount will depend on the response)



Image 2 BNHS Volunteer with the Cropland owners

### Socio-economic surveys

The collection of secondary data involved the examination of government records and published reports. Additionally, Key Informant Surveys, as per Marshall (1996), were utilized for a more qualitative and effective data gathering approach. Key informants, identified based on their personal skills or societal positions (Burgess 1982), offered valuable insights and information. Two primary programs were executed, one at Shokaliya school aimed at educating children about the Lesser Florican, and the other at Hingoniya Siyar villages targeting farmers.

With a focus on farmers, the team gathered extensive data on their agricultural practices, pesticide usage, and related aspects. The farmers were recognized as crucial stakeholders since crop fields have transformed into suitable habitats for the Lesser Florican. The primary objective was to promote Florican-friendly agricultural practices among farmers, emphasizing the importance of safeguarding the bird's habitat. The outreach efforts targeted both children and farmers to ensure a comprehensive understanding and engagement with the local community.



*Image 3 BNHS team member interacting with a farmer*



*Image 4 Socio-economic data was collected through key informants © Rajesh Parmar*

## Expected Outcome

1. 100 farmers engaged and 2-3 nest protected.
2. A network of farmers willing to be part of Florican-friendly agriculture practices gets established
3. Breeding bird survey will yield status of the floricans in study area
4. Designing a model of florican friendly agricultural practices (FFAP)

### Collaborating with an NGO to mitigate threats

Tree of Life for Animals (TOLFA) is a local NGO in Ajmer dedicated to aiding stray animals such as dogs, cows, and cats. Established in 2005 by Rachel Wright, a veterinary nurse, TOLFA focuses on rescuing animals in distress, providing treatment, vaccinations, and sterilization. With expertise in handling dogs, TOLFA's efforts align with our goal to mitigate the threat posed by dogs in areas where Lesser Floricans are sighted. During our visit to their facility near Foyesagar Lake on December 11, 2023, we discussed dog behavior and explored strategies to relocate dogs from LF sighting areas. This collaboration holds promise in reducing the threats posed by dogs to the Lesser Florican.



*Image 5 At TOLFA Centre discussing about the tackling issue of free-ranging dogs in LF areas*

## Results

After collecting data for last five years in the Ajmer landscape, observation suggested that florican shows strong site fidelity; it moves a lot in grasslands and croplands before settling down in its breeding site; once settled, it starts developing breeding plumage; it establishes its territory and displays lek system. The frequency of a male's jump becomes doubled in the presence of a female and mating lasts for about half an hour. Initially, the florican prefers jowar crop fields and is seen tolerating the presence of farmers up to 50 meters. We have heard the display sounds of a florican late into the night. A total of 3762 sq. km was covered extensively and 1727 sq. km intensively. LF was sighted at 26 sites (73 locations) across 26,621 ha (266.21 sq. km). FFAP model is being implemented at five sites where a maximum number of birds are seen.

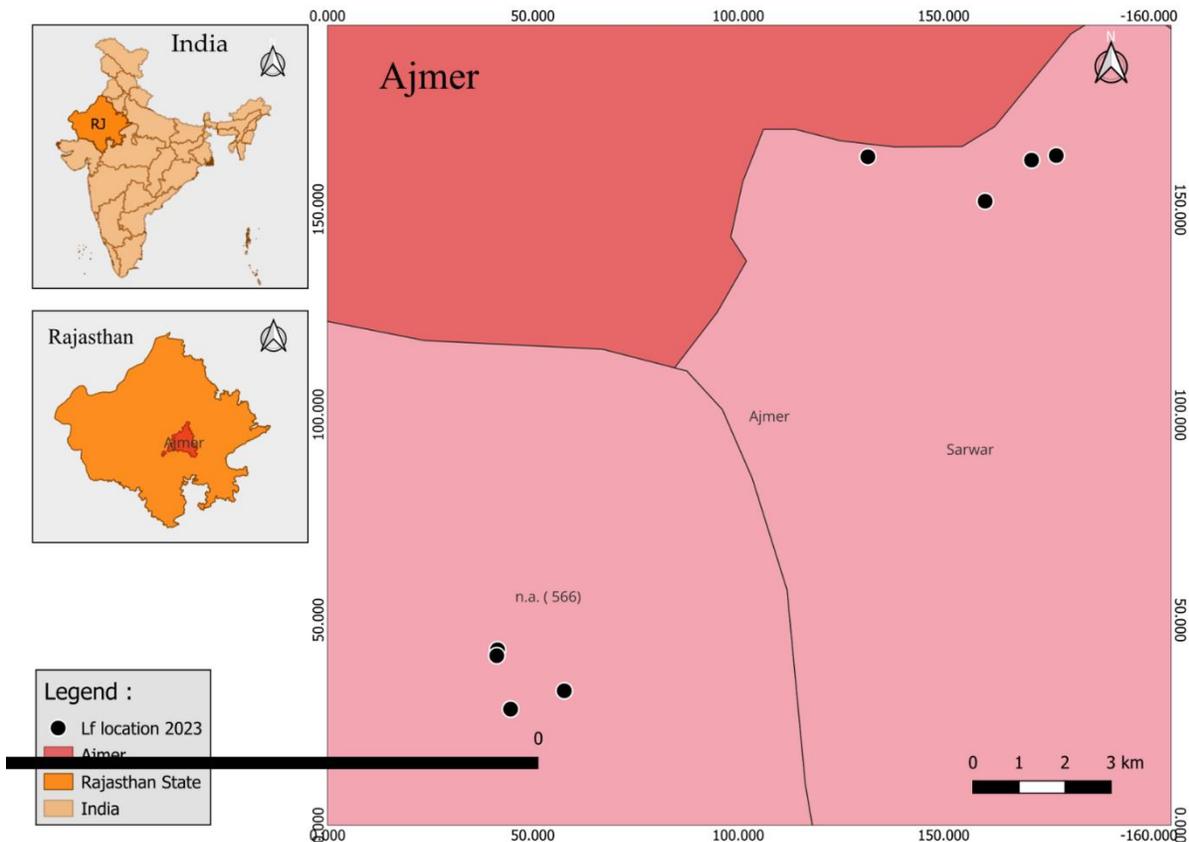


Figure 6 The map showing focused area of BNHS based on regular LF sightings during monsoon 2023



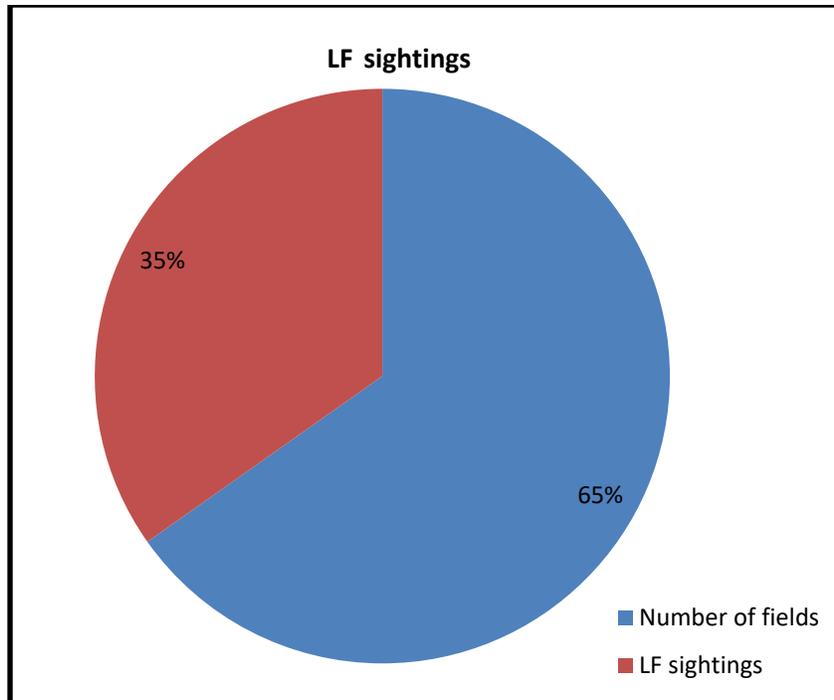
*Image 6 After awareness program locals started providing information not only about floricans but also other ground nesting birds © Shoaib*

#### **A) Understanding the birds and their status through field surveys**

LF Sightings: Lesser Floricans were observed in 24 out of the 135 surveyed crop fields. The Field survey was conducted from 01 September 2023 to 6 September 2023. In this survey polygons were made over the entire study area. At each spot in a polygon survey was conducted using point transect method. Point counts were conducted at all observation sites. Four survey teams each with 5 observers were present. The surveys were conducted in the early morning and evening hours. Important habitat characteristics such as land cover, topography, and human disturbances were recorded. In this survey 23 polygons with 73 spots were covered. A total of 3762 sq. km was covered extensively and 1727 sq. km intensively.

The survey began in the middle of the monsoon season and the dominant crops that were sown at this time were Bajra, Jowar and Moong which were suitable for the Lesser Florican display as well as egg laying for the female but this year monsoon arrived earlier than expected due to a storm named “Biperjoy” and cutting of crops was started in first week of September which usually starts in mid of September.

In the Study area, Lesser florican *Sypheotides indicus* is a small and critically endangered bird. And the display of Lesser florican was recorded only one time in the whole survey. On 01/09/2023 team of 9 volunteer, 2 Community Engagement Officers, 1 driver visited the potential site, Bhagwantpura. After scanning for half an hour, it jumped and displayed for just 10 seconds and after that not a single sighting happened throughout the survey.



*Figure 5 Number of fields where LF sightings were found*

#### Key points noted during the survey

- 1) The storm named "Biperjoy" caused the harvesting of crops to start in the first week of September.
- 2) Heavy machinery was brought in from Punjab and Haryana for harvesting. Due to the disturbance caused by the machinery and humans, no direct sightings were seen during the survey. However, there were indirect sightings.
- 3) During the survey, many functional and non-functional mines were observed in Shokaliya and its adjoining regions.
- 4) Intensive farming and widespread use of pesticides were also seen in some areas.
- 5) The team approached almost 110 farmers during the survey.
- 6) Interaction with locals that they are mostly aware of the presence of this bird. However, farmers seem hesitant to give up their land for LF conservation.

#### About bird sightings

1. This year 15 males and 5 females were sighted from the month July to August. Almost 56% decline was seen this year from the last year's survey. First sighting was on 1 July at Dhatol and last sighting was on 27 August at Kalyanpura.
2. On July 28, both male and female floricans were observed at Bhagwantpura.
3. After August 25, direct sightings got declined. On September 1, the survey team heard the call of a male florican at Bhagwantpura, but it was not visually detectable.
4. Post August 30, large harvesters operated in farmlands, cutting down Moong crops.
5. Additionally, some farmers shared information about spotting Lesser Floricans near the Hingoniya Siyar region.



*Image 7 Lesser Florican male displaying in the fields of Shokaliya village*

#### Threats observed

- Spraying herbicides and pesticides are a major threat to birds.
- The tractors with loud music systems create disturbance and hinder the display sound of male Lesser florican.
- Continuous human activity and dogs are also threats in the area.
- Alterations in land use, increase in agricultural expansion, shifts in crop cultivation, encroachment on grasslands, improper grassland maintenance, and rapid urban development have resulted in the deterioration of habitat for this grassland species.
- Habitat loss and degradation owing to conversion to agriculture and overgrazing are also some significant threats to the species.



*image 8 Types of Pesticides used in fields*

## B) Engagement with Farmers

### Understanding cropping pattern

In the study area, two crops are cultivated annually - one during the monsoon season called kharif, and the other during winter called Rabbi. Farmers start preparing for the kharif season in the first week of July. During summer, the farmers plough the farmlands to maintain the temperature and moisture of the soil. Ploughing machines are used to avoid harming the Kharif crop by mechanically removing pests and their eggs that can cause damage to the crop. Crops like Jowar, Millet, and Maize are sown for both food and fodder purposes. It takes 3 to 3.5 months for these crops to be harvested. (BNHS LF report 2020).

Table 1 Common Kharif crops in the study area

Sr. No.	Local name	Common Name	Scientific Name
1.	Jowar	Jowar	<i>Sorghum sp.</i>
2.	Urad	Black Gram	<i>Vigna mungo</i>
3.	Moong	Green Gram	<i>Vigna radiata</i>
4.	Makka	Maize	<i>Zea mays</i>
5.	Til	Sesame	<i>Sesamum indicum</i>
6.	Bajra	Pearl Millet	<i>Pennisetum glaucum</i>

Figure showing the dominant crops in the Lesser Florican display sites

### Understanding the perspectives of the farmers

The transformation of crop fields into a suitable habitat for the Lesser Florican emphasizes the importance of preserving their environment. In line with the project's objective to promote Florican-friendly agricultural practices, a key focus was on interacting with farmers. The approach involved one-on-one meetings with farmers to gather detailed information on their farming techniques, pesticide usage, and related practices. A total of 135 farmers were successfully reached, covering a surveyed area of 321.23 hectares. Among these farmers, the majority were primarily involved in agriculture. Interestingly, 47 farmers also pursued other occupations such as teaching, driving, carpentry, etc. This diverse engagement highlights the necessity for a comprehensive approach in implementing Florican-friendly agricultural practices

1. **Pesticide Usage:** The Lesser Florican, being omnivorous and relying on crop fields for larvae and insects, faces challenges related to pesticide usage. A survey of 135 farmers revealed that only 10 did not use pesticides. Among them, only 3 were knowledgeable about proper dosage, while the remaining 132 lacked awareness of the appropriate pesticide dosage.
2. **Main Fertilizers:** Farmers primarily utilized DAP, Urea, and Desi khad as fertilizers.
3. **Organic Farming:** Among the surveyed farmers, only 3 were acquainted with organic farming, and 20 expressed willingness to adopt such practices.
4. **Pesticide Application Frequency:** Within a 15-day period, 20 farmers applied pesticides twice, 30 farmers applied three times, and 3 farmers applied pesticides four times.
5. **Seed Bank:** Only 2 out of the surveyed farmers-maintained seed banks, while the majority (133) sourced seeds from Cooperative societies, Krishya Seva Kendra, and nearby shops.

6. Farming Techniques: Among 135 farmers, 52 employed a combination of modern and traditional techniques, 72 embraced modern methods, and only 2 adhered strictly to traditional practices. Heavy machinery was the preferred choice for most.

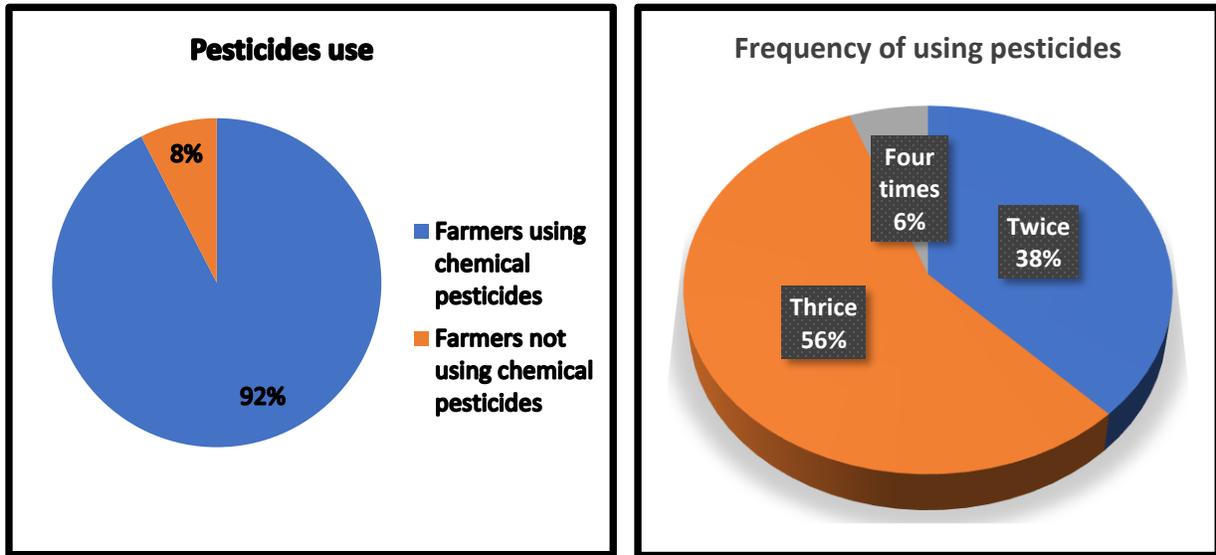


Figure 3 Map showing the number of farmers who did or did not use fertilizers;

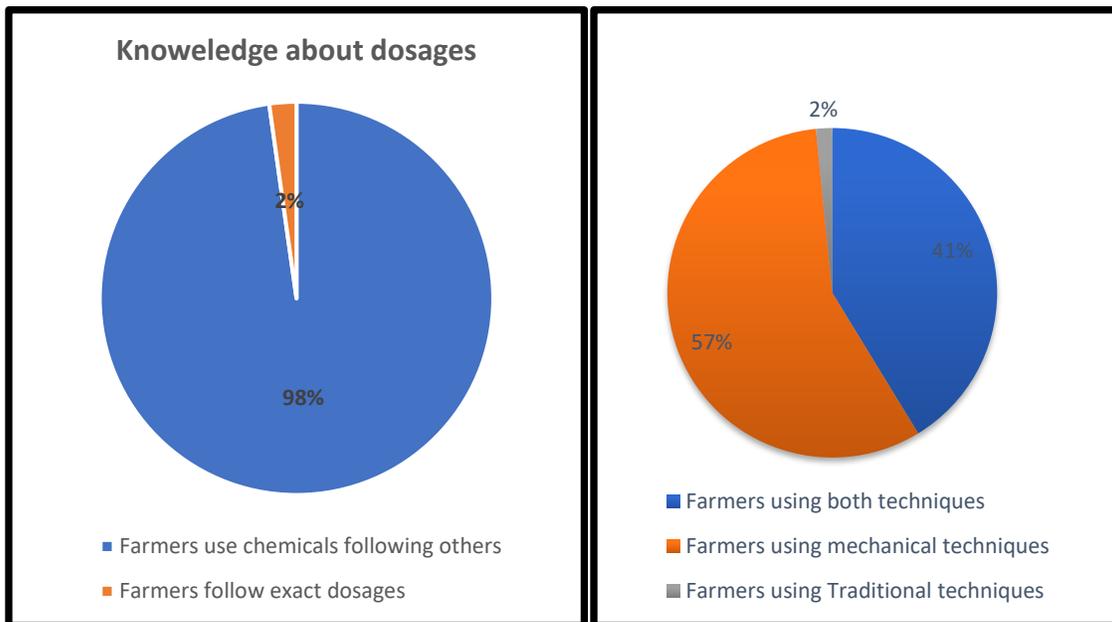


Figure 4 Left - showing frequency of pesticides used in the interval of 15 days by farmers; right- showing the percentage of farmers using the type of farming techniques

### Additional surveys done at Ratakot a grassland maintained by Forest department

Ratakot, located in the Bhinay tehsil of Ajmer, is a large village with a substantial landholding of 1000 bigha owned by the forest department. Historically covered with *Prosopis juliflora*, a project initiated in 2021 aimed to transform this land into a grassland habitat. Approximately 385 bigha have been cleared of *P. juliflora*, and grassland species such as Desi babool (*Acacia nilotica*), kummtha (*Acacia senegal*), mahua (*Madhuca longifolia*), neem (*Azadirachta indica*), bair (*Ziziphus mauritiana*), sesam (*Sesamum indicum*), imli (*Tamarindus indica*) etc., have been planted to foster the development of a thriving grassland ecosystem.

Regular visits to the area revealed the successful establishment of various grassland species, attracting diverse bird species like Rain quail, House Swift, Lapwing, Grey francolin, Bonelli's eagle, Black-winged kite, Indian roller, *Zitting cisticola*, and mammal species like Nilgai and Golden jackal (For All the species list see Annexure) However, a notable concern emerged with the presence of feral dogs in groups of 5-6, posing a potential threat to the avian residents. In contrast to previous initiatives the forest department's efforts in Ratakot have been commendable, resulting in the prevention of *P. juliflora* resurgence. The project has proven to be a significant success, transforming the land into a robust and healthy grassland habitat conducive to the well-being of various grassland species. Looking ahead, this area holds the potential to contribute significantly to the conservation of the Lesser florican. In 2019, following the BNHS team's recommendation, a forest reserve area spanning 893 hectares was proposed for conservation and habitat restoration, with the intention of creating a conducive environment for the Lesser florican. However, in 2023, it is disheartening to report that this area has once again succumbed to the invasion of *Prosopis juliflora* (*P. juliflora*), reversing the positive strides made in habitat restoration.

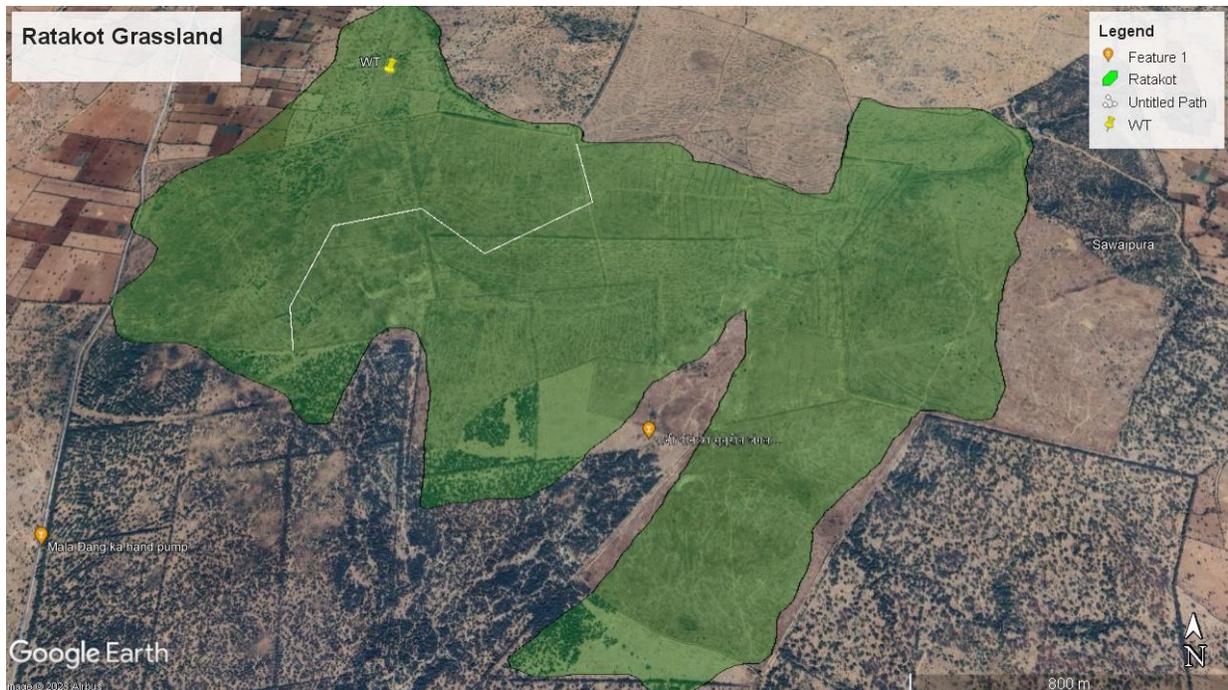


Figure7 Map of Ratakot Grassland Total area

## Outreach programmes

### 1) At the Government school, Shokaliya

FFAP encourages farmers to refrain from using chemicals and heavy machinery in their fields to maintain a Florican-friendly environment in the breeding sites. During the peak breeding season of the birds in July 2023, the team reached out to the Rajkiya Varisth Upadhyay Sanskrit School in Shokaliya to organize various activities for the school students. Dr. Anjana Pandey, the school's principal, provided essential support for these initiatives. Through this program the status of Floricans was taught to people. This was followed by various competitions, including writing, drawing, speeches, and quizzes for students from nearby villages. The winners in all categories were honored during a prize distribution ceremony held on September 6, 2023. The event was graced by Shri Abhimanyu Saharan, IFS, DyCF, Ajmer; Dr. Praveen Mathur, Secretary of Bird Life Conservation, Ajmer, and retired professor of Maharshi Dayanand University (MDSU), Ajmer; Dr. Sujit Narwade, Assistant Director, BNHS; Dr. Anjana Pandey, Principal of Rajkiya Adarsh Varisht Upadhyay Sanskrit School Shokaliya, and Mr. Rajendra Singh, representative of Sarpanch, Shokaliya Gram Panchayat, and a retired forester, who addressed the program. As a symbol of the Florican's significance, a life-sized marble sculpture of the Lesser Florican was installed in the principal's office, a frequently visited place by teachers, students, parents, and local leaders.

### 2) At Hingoniya-Siyar

Hingoniya- Siyar area are very important areas with the perspective of Lesser florican. In order to spread awareness among the farmers of this area “*Jan Jagruti*” Kharmor Conservation with Jan Sahbhag was bf in Hingoniya in which. Farmers from 8 nearby villages were involved and were educated farmers on the importance of kharmor. Florican friendly techniques were also taught to the farmers in which importance of kharmor for their crops was also included. At the end of the program all the farmers took pledge to protect Kharmor and other birds. Some of the farmers were awarded with the memento and gave them the title of “*kharmor mitra*” for their contribution in the conservation of lesser florican. Our team insist them to take a pledge to adopt Florican Friendly farming methods in future. Various frames showing both male and female were given to hotels, school and RTO office of Kekri to catch the local people’s attention towards Lesser florican.

### Feedback of the Outreach programmes

The LF population is declining rapidly and Ajmer is one of the major strongholds. From 1980 to 1990, the Shokaliya area was also home to the Critically Endangered Great Indian Bustard, but it is now locally extinct from Ajmer area. Farmers can play vital role in the conservation of bird species like Lesser Florican, which mainly breeds in the agriculture fields. During the breeding period, it must be ensured that there is less disturbance to the display and nesting sites. Sensitizing the local people in this regard is crucial. Hence, a sensitization programme to enable a discussion on the conservation of Lesser florican was organized on 31 August 2023 Villagers including the Sarpanch, farmers, common residents, attended the event. Series of awareness and nature education activities held in the schools of Shokaliya. The focus was to create awareness about nature in general and LF conservation in particular through fun filled activities. Folk songs, dance and poems on Lesser Florican or Kharmor were planned by students. The best teams were given an opportunity to perform during the final event. Under nature education programme, various competitions like quiz were organized and winners were felicitated during

the final event. Earlier this program the farmers of Hingoniya-Siyar region did not know much about the Lesser florican. This program helped farmers to learn about this critically endangered bird and made them understood about the importance and need to protect this bird. As result farmers and villagers later reported the sightings of kharmor, found eggs of other birds in the field and gave information about several birds present in their field. They also shared information about the hunting going on in the area. It was surprising that earlier the farmers and villagers did not know about the Lesser florican at all but due to continuous visit of the BNHS team and awareness programs by the team as a result this year most of the farmers know about Lesser florican and its importance.



*Image 9 BNHS team interacting with villagers*



*Image 10 BNHS team interacting with farmers and spreading awareness towards LF in the Hingoniya- Syar region*

## Discussion

Farmers expressed a positive attitude towards the Lesser Florican, despite the lack of agreement on the conservation scheme. They were genuinely interested in contributing to saving the bird, and asked many questions about identifying its eggs and reporting sightings to the team. Some farmers even reported unusual bird sightings in their fields. When informed about the potential harm that machinery could cause to the Lesser Florican, farmers were supportive and committed to being vigilant for eggs or birds during machinery operations.

The overall response from the farmers was positive, indicating their willingness to collaborate in the conservation efforts for the Lesser Florican. The team is now dedicated to building trust and further engaging with farmers to achieve this shared conservation goal. However, two major concerns regarding the FFAP were raised.

### **A) Hesitation by the farmers relinquishing their land, indicating a need of changing the current strategy because of following.**

Harvesters from Punjab and Haryana arrive at specific times based on orders received from a bulk of farmers. If a farmer wishes to delay the Kharif harvesting for the benefit of the floricans, it will cause a further delay in the sowing of the rabi crop. Additionally, the cost of manual cutting labor is much higher than using the harvesters. Furthermore, even standing crops are under tremendous pressure to avoid damage from the rains. As a solution, we offered Rs. 5,000 per bigha, but the farmers expressed a higher expectation of approximately Rs. 10,000 per bigha, which should be taken into consideration.

## B) Preference for conventional farming over traditional

In traditional crop farming, there is expected to be a significant decrease in yield. Therefore, it would be helpful to conduct a detailed survey or consultation to better understand the specific concerns and preferences of farmers. A viable solution could be to provide market linkages that offer higher prices for organic crop products such as moong and urad, and incentivize the use of organic fertilizers and chemicals.

## C) Sparing land model

Early engagement with farmers before the sowing season is crucial for effective conservation measures. It is also possible to negotiate with farmers to allocate a patch of land exclusively for conservation purposes, either on lease or for long-term survival of the species. However, very few farmers agreed to allocate land for conservation. They cited reasons such as prior commitments to large harvesting machinery from Punjab and Haryana, demands for upfront payments exceeding the proposed per bigha rate, and concerns about potential losses after relinquishing their land.

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## Glimpses and photo documentation



Image 11 **Left:** BNHS team conducted various competitions in school as per the awareness programme; **right:** Students showed their creativity through the drawings



image 12 Students were honored and felicitated for their participation in competitions organized to raise awareness about the Lesser Florican



*image 13 A life-sized marbled statue of the Lesser Florican now graces the heart of the school, finding its place of honour in the principal's office.*



*Image 14 Recognizing acknowledging Kharmor Mitra through an outreach program.*



Image 15 Recognizing farmers for getting associated with the florican conservation



Image 16 Sensitizing government agencies



Image 17 Presenting a photo frame featuring the Lesser Florican male and female to a nearby hotel, ensuring it captures the attention of visitors



Image 18 Presenting a Lesser Florican (LF) photo frame to the District Forest Officer (DFO) of Ajmer as a token of appreciation and support.



*Image 19 The BNHS team with former Chief Wildlife Warden Dr. M.L. Meena during a field*



*Image 20 Team after a field survey at Hingoniya site*



*image 21 The community engagement officer is elucidating to farmers how their parcel of land can contribute to the conservation of the critically endangered bird.*



*Image 22 Team interacting with farmers during survey*



*Image 23 The team is gathering on-the-ground data after the harvesting period to assess the current situation.*



*Image 24 Delivering a presentation at MDSU to raise awareness among students and inspire them to volunteer for the conservation of the critically endangered bird.*



*Image 25 Large harvesting machinery being brought in from Punjab and Haryana.*



*Image 26 Golden Jackal Spotted in the Ratakot conserved areas*



Image 27 Farmers spraying harmful pesticides in their fields



Image 28 The Lesser Frigatebird painting on the wall of Shokaliya school



*Image 29 Sings like footprints are important to track the floricans*