

The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole

Grants Director

Grant Recipient Details	
Your name	Mr. Vishwas (Bhau) Katdare
Project title	The Konkan Vulture Project: Vulture Food Base Trend due to Socio-Economic, Geographical and Policy Factors
RSG reference	14975-1
Reporting period	12 months
Amount of grant	GBP 5,980.00
Your email address	sahyadricpn@gmail.com
Date of this report	13 th Aug 2015

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Data Collection				
Survey of the entire Konkan region to identify carcass dumping places / villages			✓	Entire Konkan region was divided in 8 circular zones with present or past vulture colony or place of sighting at the centre to locate carcass dumping places. Additionally letters were sent through Forest Department to local governing bodies (<i>Gram Panchayat</i>) to gather vulture sighting data
Appoint locals to monitor carcass dumping places for vulture sighting			✓	Locals in every zone were appointed to report any vulture sighting at carcass dumping places
Locals were surveyed to document carcass disposal methods and reasons			✓	Cattle owners, other villagers were surveyed
Data Analysis				
To analyse effect of socio-economic, geographical conditions, carcass disposal state policies and their implementations on vulture food base and existence of vulture colonies			✓	Reasons of choosing specific carcass disposal method were identified. Safer carcass disposal methods were defined and submitted to Animal Husbandry and Forest Departments
Dissemination				
Identify action areas to establish vulture safe Konkan		✓		Action areas have been discussed with Forest Department and the project report has been submitted. Follow up with Saving Asian Vultures from Extinction (SAVE) has been done for Provisional Vulture Safe Zone (pVSZ) status

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

- As a part of "Saint Gadage Baba *Gram Swachata Abhiyan*" (Village Cleanliness Program) most local governing bodies advise villagers not to keep carcasses in open. Due to this

reason, initially people were informing burial as preferred carcass disposal method which made locating carcass disposal open grounds difficult in the beginning. Continuous interaction with locals, assuring them that this is an independent work and not linked with Government, addressing people through village level meetings helped to get actual information about carcass disposal methods.

3. Briefly describe the three most important outcomes of your project.

- Identification of carcass dumping places in the entire Konkan region – As a part of “The Konkan Vulture Project” Sahyadri had surveyed the entire region to locate vulture colonies. The next task was to locate all carcass dumping places in the region and monitor on regular basis. This grant helped to carry out the first every survey of the region to identify 114 carcass dumping grounds in the region. Refer Appendix I for these places.
- Identification regular feeding grounds of vultures – Compared to the number of individuals in the region, fewer vultures were seen at Sukondi which was the only known feeding ground prior to this project. So there was a need to locate other places where vultures feed on carcasses kept in open by villagers. Survey to identify carcass dumping grounds and regular monitoring helped to identify additional places where vultures feed. Most of the vulture colonies and their feeding grounds are along Raigad – Ratnagiri border area. Refer Appendix II for these places. No vultures have been sighted in other parts of Ratnagiri and Sindhudurga where almost equal number of carcass dumping grounds exists compared to places in Raigad.
- Food availability for vultures – Sahyadri’s survey has identified socio-economic-geographical-policy factors that prompt villagers to select a particular method of carcass disposal as listed in Appendix III. At least 2-3 carcass dumping places are within the radius of 10-15 Kms of every vulture colony and vultures have been sighted regularly. The map in Appendix I shows that carcass dumping grounds are scattered where there is no vulture sighting whereas carcass dumping grounds are closer where vultures nest and sighted regularly.
- Jointly with the help of Forest Department, fencing of carcass dumping places in Ratnagiri district where vultures have been sighted regularly. This shall help prevent botulism outburst in the area.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

- Local community rangers – To increase community participation in vulture conservation, Sahyadri had appointed local people to work as community rangers. These community rangers visited carcass dumping sites regularly and informed about carcass disposed and vulture sighting.
- Maintaining carcass dumping grounds – Most of the carcass dumping grounds are privately owned land away from village. To avoid diseases like botulism, Sahyadri with assistance of Forest Department ensured that such grounds where vultures are sighted regularly are fenced with the owner’s permission to prevent stray dogs and other animals. Sahyadri also involved local governing bodies to clean up these grounds on regular basis. Borkhat, one of

the villages having vulture sighting on carcass dumping ground celebrated “Botulism Free Holi” – the Festival of Colours by cleaning carcass dumping ground.

- Participation of cattle owners – In case of vulture sighting Sahyadri ensured that neighbouring villagers are aware about nearest carcass dumping site and use the place for dumping carcasses.

5. Are there any plans to continue this work?

Yes. Sahyadri plans to continue the carcass monitoring work along with the protection of vulture colonies by local participation. Sahyadri plans to work on the following components

- Participatory in-situ conservation of vulture colonies
 - Monitoring of nests by Local Community rangers
 - Compensation to coconut growers having vulture nests as they forego produce
- Continuation of anti-diclofenac awareness drives
 - Regular survey of chemists
 - Hosting Jatayu Festival (Vulture Festival) to promote tourism
- Monitoring of carcass dumping ground
- Further develop vulture safe carcass dumping grounds based on carcass dumping guidelines

6. How do you plan to share the results of your work with others?

- Sahyadri has conducted workshop with Forest Department, Animal Husbandry Department workshop. Sahyadri also involved other local NGOs.
- Sahyadri has been interacting with SAVE members. Results shall be shared with SAVE members before the next SAVE meeting.
- Sahyadri shall also use website (www.snmcpn.org) to publish result of the project.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The project was started from the date of receipt of RSG i.e. 30th Jul 2014. The actual length of the project is same as anticipated at the time of proposal which is 31st Jul 2014 – 30th Jul 2015.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	RSGF Budgeted Amount	Actual Amount	Difference (Budget – Actual)	Comments £ sterling 1 = INR 101.21 (Local exchange rate)
Printing of postcards	25.00	3.63	21.37	Forest Department showed active interest in sending letters so less expense was incurred. This amount was utilized to print posters and banners.
Letters in coordination with Forest Department	175.00	51.66	123.34	

Fuel Expenses	2250.00	2,661.63	-411.63	Local travel and monitoring of community rangers in the project region
Lodging and meal expenses during the surveys	1080.00	812.78	267.22	In most places Sahyadri's staff either made one day trips or stayed at acquaintances so less expenses were incurred
Compensation for community rangers to monitor vulture feeding	1350.00	1,084.99	265.01	Few villagers participated voluntarily to monitor carcass dumping grounds in their village and neighbouring villages.
First Workshop with Forest Department, Animal Husbandry Department and other NGOs	250.00	302.57	-52.57	Both workshops were conducted in coordination with Forest Department, Animal Husbandry Department and other NGOs.
Second Workshop with Forest Department, Animal Husbandry Department and other NGOs	250.00	132.15	117.85	
Team Member Salary	600.00	822.90	-222.90	Additional 2 people were hired part time during May-Jun for increased monitoring and data collection from community rangers.
Awareness Material (posters, banners)	0.00	107.69	-107.69	Less amount incurred for printing of letters to villages was utilized to print banners and posters
TOTAL	5,980.00	5,980.00	0.00	

9. Looking ahead, what do you feel are the important next steps?

- Coordination between Forest Department and Animal Husbandry Department to accept guidelines on safer disposal of carcasses so that places where vultures are sighted regularly can be used as vulture feeding grounds in collaboration with AHD and neighbouring villages. All other places may opt for safer burial of carcasses to maintain cleanliness in village. Refer Appendix V for carcass dumping guidelines.
- Prime Minister's "Swachha Bharat Abhiyan" (Clean India Programme) to adopt safer carcass disposal guidelines for its spread all over India
- Further study is required to identify parameters based on which vultures may select feeding grounds as it has been observed that vultures are not sighted at certain carcass dumping grounds though closer to the vulture colony compared to other carcass dumping grounds. E.g. Vultures have not been sighted at Shekhadi, a carcass dumping village which is 6 Km. (road distance) North of Shrivardhan's vulture colony. Instead vultures are sighted at villages which are 17-20 Km (road distance) South of the vulture colony. Similarly vultures have not been sighted at carcass dumping sites which are beyond 30-40 Km radius e.g. rest of Ratnagiri and Sindhudurga districts.



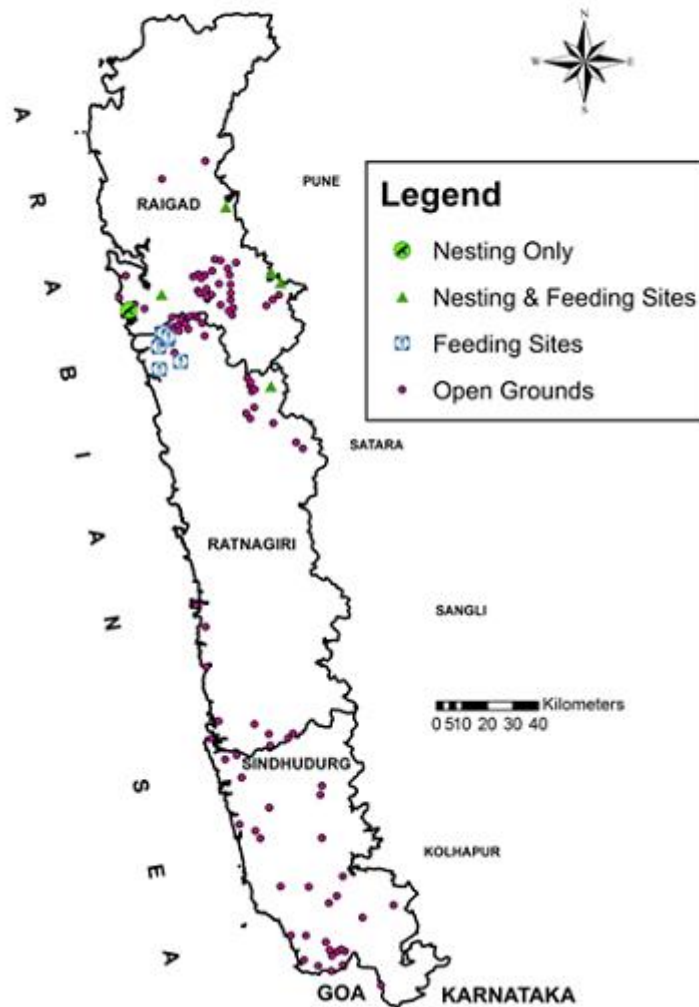
10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

RSGF logo has been used on anti-diclofenac posters, workshop banners, leaflets about vulture related Dos and Donts. This material was distributed in villages, chemist shops. RSGF contribution has been mentioned in the workshop conducted with Forest and Animal Husbandry Department.

Appendix

I. Villages having open carcass dumping practice

Vulture nesting sites and carcass disposal sites in Raigad, Ratnagiri & Sindhudurg districts



District wise distribution of Carcass dumping places



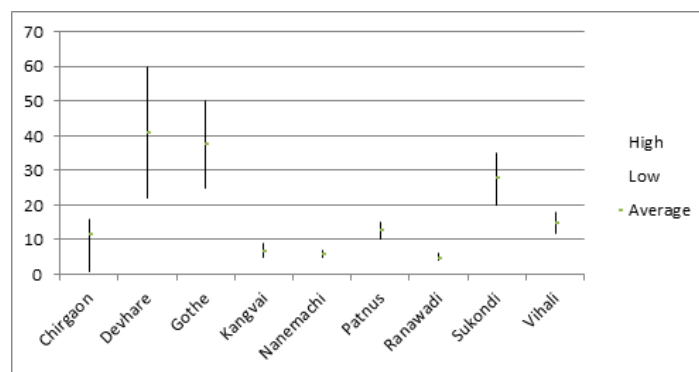
II. Vulture sighting at carcass dumping sites

Village	Number of carcass dumped from Oct 2014 – Jul 2015	Maximum number of vultures sighted
Chirgaon	8	16
Devhare Group Gram Panchayat ¹	36	60
Gothe Group Gram Panchayat ²	40	50
Kangvai	5	9
Nanemachi	10	7
Patnus	20	15
Ranawadi	7	6
Sukondi ³	55	35
Vihali	15	18

¹Gothe Group Gram Panchayat consists of villages Borkhat, Borkhat Baudh Wadi, Dhamani, Gothe, Gothe Bandar Wadi, Kalkavane

²Devhare Group Gram Panchayat consists of villages Atale, Devhare, Konkavali, Malegaon, Nayane, Samane, Vadavali

³Sukondi feeding grounds once initiated by Sahyadri is now managed by Forest Department with the help of locals and get carcasses from Aade, Anjarle, Kelshi, Murdi, Padale, Rajapur, Sukondi



III. Factors affecting carcass dumping method

Category	Factors	Preferred Disposal Method	
		Open	Burial
Economical	Lower income group farmers	Yes	-
	Middle and higher income group farmers	-	Yes
	Cow shelter houses / trusts	-	Yes
	Free service by Forest Department / NGO maintaining nearby vulture feeding ground	Yes	-
Social	Following traditional practice of village	Yes	Yes
	Villager's strong perceptions on cleanliness	-	Yes
	Strong bonding with animal – cows, calves	-	Yes
	Diseased animal	-	Yes
Geography	Rocky Terrain	Yes	-
	Proximity to sea / river	Yes	-
Policy	Lack of guidelines about carcass dumping by Animal Husbandry / Health Department	Yes	Yes
	Possibility of legal action by Gram Panchayat if thrown in open	-	Yes

IV. Vulture Survey Data

Number of people surveyed: 2,045

Number of villages surveyed: 1220

Category	Details	Findings		Comments
Cattle treatment	Traditional	50%	% is of number of people surveyed	Cattle owners from remote places prefer traditional treatment
	Veterinary	40%		
	No Answer	10%		
Cattle disposal method of village	Burial	90%	% is of number of villages surveyed	District Raigad having highest number of open carcass dumping villages may be the reason for nesting in vicinity.
	Open	8%		
	Both	2%		
Vulture Awareness	Witnessed Nesting	10%	% is of number of people surveyed	It has been observed that vulture awareness is better near nesting sites and lower at other sites.
	General Sighting	5%		
	Identification*	70%		
Reason for decline ⁺	Diclofenac	5%	% is of number of people surveyed	
	Scarcity of food	52%		
	Habitat Loss	10%		
	Other / Unaware	33%		

*To confirm if person can identify vulture questions were asked about size, habitat, flying, feeding habits

⁺To identify knowledge about reason for vulture decline questions were asked about frequency of vulture sighting, last vulture sighting, observed any trend, effect on daily life, any financial effect, source of information – news, lecture etc.

V. Carcass dumping guidelines

The following draft guidelines have been prepared based on discussions with veterinary doctors, vulture conservationists and have been submitted to Animal Husbandry Department and may be refined further.

The need for the guidelines

- The responsibility of owning animals does not end when an animal dies. The animal owner needs to dispose all remains properly within 24 hours of learning of an animal's death.
- Though local governing bodies advise burial of dead cattle, there is no uniform practice of cattle disposal in Konkan. Without proper disposal burial or throwing dead cattle in open both methods pose risk such as groundwater contamination, botulism etc. Therefore, selection of site, following specific process is very important.
- Animal carcasses and by-products not intended for human consumption are a potential source of risks to public and animal health. Disease outbreaks could also have negative consequences for the environment, not only due to the disposal problems posed, but also as regards to biodiversity.
- Many times the death of the cattle does not get reported to veterinary doctors. Without ascertaining the cause of death the disposal methods is selected based on the financial condition and ease of disposal for the cattle keeper without giving due consideration to after effects.
- In case of natural or accidental death of cattle without any medication possibility of vulture feeding site is not given due consideration

The objective is to develop safer carcass disposal guidelines and help vulture conservation. Vultures one of the major scavenger birds is drastically declining in its population one of the reasons being non availability of sufficient food.

Some points that can be taken into account for disposing carcasses are as follows:

- a. Handling and transportation of carcasses
- b. Modes of disposal
- c. Disposal of diseased carcasses if any.

Handling and transportation of carcasses:

Persons handling domestic animals must be aware of the need to protect themselves, co-workers and others against the potential exposure to infectious agents, and its inadvertent spread. Diseases not known to be dangerous to humans can also spread to unaffected animal population by careless carcass handling and inadequate disinfecting of gloves, clothing and tools.

A. Before handling carcasses:

Before handling a carcass, confirm the animal is dead by prodding with a long-handled tool. Startling an injured, apparently lifeless animal can otherwise be dangerous.

B. Lifting and moving carcasses:

Care should be taken when lifting and moving carcasses to avoid back injuries. An assessment of the weight and awkwardness of a carcass should be made before attempting to lift or move it. A large or heavy domestic animal carcass may require four to six people and lifting equipment.

C. Tools:

All tools used for handling dead domestic/wildlife should be dedicated to this purpose only. These tools should have no pointed or sharp edges, and should be clearly marked to identify them for carcass handling purposes. Disinfect contaminated tools, equipment and vehicles regularly.

Modes of Disposal:

A. Safe Open Disposal for vultures:

Biodiversity losses are increasing as a consequence of negative anthropogenic effects on ecosystem dynamics. Most Old World vultures have experienced rapid population declines in recent years due to presence of diclofenac in animal carcasses.

Apart from the above reason food shortage has also playing a role in declining vulture population. As of now in Konkan dead cattle's are being buried in most places making it difficult for vultures to access food, and hence it is necessary to assess the potential impacts of policy decisions on future changes in biodiversity and ecosystem services.

Cattles grown old or those died due to injuries caused by road accidents, electrocution or by other natural calamities, after supervising by veterinary doctor that they are not infected by communicable disease and by checking its medical history from owner based on animal health cards as spot test to detect diclofenac is not available can be placed in the designated vulture feeding ground. Care should be taken that following are guidelines met by such designated area

- Vulture feeding ground is monitored by Forest Department / Animal Husbandry Department / local NGO so that identification of proper place, its maintenance cost, remuneration and medical check-up of dedicated person, transportation can be arranged. It is important to create awareness about such place and ensure response time when called for active. Due recognition to the property owner, regular clean up shall ensure public acceptance of such place.
- Known vulture sighting, nesting in at least 50 Km radius
- The designated area should have adequate size for safer take-off and landing of vultures high fence and with a door and lock
- The area is above the rest of the villages and at least 1Km. away from watercourses, bores and wells, residential area
- Due consideration should also be given to the direction of prevailing wind to avoid odour spreading to nearby villages

B. **Burial:** If there is a vulture colony in 50Km radius and if there is a history of vulture sighting in nearby villages, keeping animal dead carcass at the designated vulture feeding ground should be considered over burial. If this action is chosen for disposal of dead animals then the location of disposal should be properly selected which must be at least 1 Km away from any dwelling area, grazing area and any water sources. This method of disposal cannot be used in case of disposal numerous carcasses. The dead animal should be covered with hydrated lime since it protects the carcasses from being uncovered by other animals. Lime should not be placed directly on carcass as in wet conditions as it slows and prevents decomposition. Following points should be given due consideration in case of burial:

- Environmental aspects, such as:
 - At least 1 Km away from any dwelling area, grazing area and any water sources
 - Slope of the land and drainage to and from the pit
 - Permeability of soil
 - Due consideration should also be given to the direction of prevailing wind to avoid odour spreading to nearby villages
- Site considerations, such as:
 - Avoid rocky areas, which make digging difficult and costly
 - Select stable soils that can take the weight of equipment used to construct and fill the pits
 - The pit should be deep enough so that wild animals do not dig out the carcass
 - Prevent surface runoff from entering the pit by constructing of diversion banks
 - Construct similar banks to prevent liquids escaping from the burial site

- Fencing may be necessary to prevent animals until the site is safe for use
 - The dimensions of the pit should be decided based on the size of the carcass
- C. **Incineration:** Biological incineration is an efficient carcass-disposal system, achieving safe and complete disposal with minimal pollution. The cost of establishment and operation, however, and lack of portability mean that incinerators may not be readily available. Special procedures must be followed for transportation of infected material from infected premises to the incinerators and disinfection of containers and vehicles.
- D. **Rendering:** Rendering of animal mortalities involves conversion of carcasses into three end products—namely, carcass meal (proteinaceous solids), melted fat or tallow, and water—using mechanical processes (e.g.: grinding, mixing, pressing, decanting and separating), thermal processes (e.g., cooking, evaporating, and drying), and sometimes chemical processes (e.g.: solvent extraction). The main carcass rendering processes include size reduction followed by cooking and separation of fat, water, and protein materials using techniques such as screening, pressing, sequential centrifugation, solvent extraction, and drying. Resulting carcass meal can sometimes be used as an animal feed ingredient. If prohibited for animal feed use, or if produced from keratin materials of carcasses such as hooves and horns, the product will be classified as inedible and can be used as a fertilizer. Tallow can be used in livestock feed, production of fatty acids, or can be manufactured into soaps.

Rendering facilities should be constructed taking into account the requirements of Health and Safety. Construction must be appropriate for sanitary operations and environmental conditions; prevent the spread of disease-producing organisms, infectious or noxious materials and development of a pungent condition.

- E. **Composting:** Composting animal mortalities and by products allows recycling the nutrients in the carcasses and is a sound environmental practice. In order to implement composting of animal carcass or by product a composting plan must be prepared. The plan must include a drawing of composting area, a description of how to contain any run-offs from the compost piles or bins, a description of the composting process that is going to be used and the description of how the compost is going to be used.

Options should also be made available to people wanting to operate a communal compost pile, that accepts carcasses from outside sources.

Disposal of diseased carcasses

BOTULISM: Botulism is a paralyzing disease of animals, birds and humans caused by a potent nerve toxin produced by the bacteria *Clostridium botulinum*. *C botulinum* and its spores are widely distributed in the environment in soils, sediments, and in the gastrointestinal tracts of fish and animals. The bacterium exists in two states:

- As dormant spores which are resistant to environmental degradation and
- As a vegetative state when the bacterium is growing under anaerobic conditions.

Toxin is produced when the bacterium is in the vegetative state and is either ingested in the feed or is produced by the botulism bacteria as it grows in the gut or in deep wounds.

Clostridium botulinum is not a single species. Instead it is a constellation of culturally distinct groups of organisms that among them, produce seven (A, B, C1, D, E, F, G) serologically distinct toxins, all with similar pharmacological action. Toxin types C and D mostly cause outbreaks of botulism in animals and birds.

Frequently Asked Questions related to Botulism

Under what condition does outbreak of Botulism occur?

Areas where the soil is deficient in phosphorus and calcium, the cattle's tend to chew the bones and carrion containing botulism toxin to satisfy their craving for phosphorus and

calcium. Due to the remote locations the affected animals may die unnoticed. The carcasses of the botulism affected animals also provide an ongoing risk for further cases of botulism.

How to dispose of dead carcasses affected with botulism?

Animal carcasses should be deep buried in clay or plastic-lined pits with at least three meters of soil over the top. The rumens need to be slashed in several places to prevent gaseous distension which could cause the carcasses to rise to the surface. The site of the burial pit should be such that leachate does not enter the water table. Rendering is an alternate possibility.

Is Botulism infected carcass safe for Vultures?

Although vultures are known to have surprisingly low stomach Ph. which ranges in 1 to 2 because of which they themselves don't get infected and thus don't spread these harmful bacteria it is advisable not to use such carcasses for vulture feeding in view of the safety of other animals.

ANTHRAX: It is an acute widespread infectious disease of all warm blooded animals specially cattle, buffalo, sheep, goat. It is communicable to man i.e. zoonotic disease. It is soil-borne infection. It usually occurs after major climatic change. The disease is enzootic in India. This disease is caused by bacteria called *Bacillus anthracis*.

Transmission: From an anthrax infected carcass that was not burned or was left exposed, by flooding pastures with water contaminated with anthrax spores or dumping an infected carcass into streams or ponds, Wounds caused by blood sucking insects that came from terminally infected animals or carcasses, Contaminated feed, especially in the form of bone meal, meat scraps, and other animal protein products.

Frequently Asked Questions related to Anthrax

How to dispose of dead carcasses affected with Anthrax?

Disposal by incineration is preferred (Complete burn should be achieved); however, deep burial can also be accepted. Evaluate each animal before disposal, and ensure that all body openings are plugged with an absorbent material (e.g. non-perforated paper towel, cloths, etc.) before a carcass is moved. Lime or other calcium products should be avoided if burial is used as method of disposal for cattle died because of anthrax as it is known to protect, rather than destroy, anthrax spores.

What other precautions should be taken while disposing dead carcasses affected with Anthrax?

- Avoid autopsy.
- Move the herd from contaminated premises.
- Destroy contaminated fodder by burning.
- Disinfection of cattle shed.

Is Anthrax infected carcass safe for Vultures?

Although vultures are known to have surprisingly low stomach Ph. which ranges in 1 to 2 because of which they themselves don't get infected and thus don't spread these harmful bacteria it is advisable not to use such carcasses for vulture feeding in view of the safety of other animals.

VI. Awareness Material Distributed through Villages

Ban on Veterinary usage of Diclofenac poster

Dos and Donts about Vulture sighting



VII. Photo Documentation



Photo 1: Awareness camp for people at Shrivardhan having vulture nesting / activity



Photo 2: Vultures sighted at Gothe Carcass Dumping Ground



Photo 3: Vultures sighted at Chirgaon



Photo 4: Workshop conducted for villagers about carcass dumping ground



Photo 5: Conducting survey in Chirgaon



Photo 6: Workshop conducted with Forest Department and Animal Husbandry Department