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Preventing Diclofenac-caused Vulture Decline in India by Subsidizing Alternative Drugs : Economic Benefits and Costs

Executive Summary:

The dying out of vultures due to the use of Diclofenac for cattle causes huge human health costs to India. Meloxicam is an effective alternative to Diclofenac, but is more expensive, and needs subsidization to change usage. As against estimated health costs and productivity losses (mainly from rabies) of as much as Rs. 7,800 Crores, subsidizing Meloxicam nation-wide will cost only Rs. 21 Crores to Rs 25 Crores for making it 10% to 20% cheaper than Diclofenac, respectively. This subsidization is strongly recommended on economic and health grounds.

Background:

Described by Dr. Salim Ali as 'God's own incinerators', vultures provide a range of vital ecological services to humankind, most notably disposal of carrion. These services have important implications for human well-being, as uneaten carcasses pose a threat to human health by providing a breeding ground for potentially pathogenic bacteria such as anthrax and maintain a natural check on the populations of feral dogs and rabies. Moreover, the biodiversity and ecosystem services from vultures are also important for their economic and livelihood values and cultural significance for Hindus, Parsis and Buddhists.

Since the 1990s, vulture populations in the subcontinent have witnessed the most dramatic decline of a wild species in human history – an estimated loss of 99% in last 20 years. Extensive studies (Oaks et al., 2004; Green et al., 2004; Shultz et al., 2004) have identified the cause of declines to be *Diclofenac* – a non-steroidal anti-inflammatory drug (NSAID) commonly used for treating livestock that is highly toxic to vultures. In response to these findings, the Indian government established a directive to phase out *Diclofenac* within a stipulated time frame – starting with a ban on its veterinary use in 2006; and approved the vulture-safe drug *Meloxicam* for veterinary use. Despite such measures, there is evidence that *Diclofenac* continues to be available in alternative formulations (notably Human

Diclofenac) and used for veterinary purposes (see Table.1.); resulting in a continuation of vulture deaths and loss in valuable ecosystems services (Cuthbert et al., 2011).

Table.1. Vial Size, Price Range, Average Dosage, Treatment Duration and Cost of Treatment for Treating Livestock with Diclofenac and Meloxicam

Compound	Vial Size (ml)	Price Range (INR)	Average Price (INR)	Dosage (ml)	Treatment Duration	Price per Treatment (INR)
Diclofenac*	30	8-44	26.7	11	Daily for 3 days	34
Meloxicam	30	30-110	50.2	27.5	Single dose	50

*Note: * All Diclofenac samples collected were that of Human Diclofenac being sold for veterinary use*

Source: Based on Study conducted across 11 Indian states from November 2007 to June 2010; Cuthbert et al. 2011

Estimated Cost of Subsidising *Meloxicam* for Treating Livestock

Based upon current literature on market price, the estimated economic cost of eliminating *Diclofenac*-use and replacing it with *Meloxicam*, via a subsidy policy benefitting *Meloxicam* are as follows:

- Minimum Amount of Subsidy required to make treatment cost of *Meloxicam* at par with *Diclofenac* = **INR 17.5 Crores**

- Amount of Subsidy required to make treatment cost of *Meloxicam* 10% cheaper compared to *Diclofenac* = **INR 21.1 Crores**

- Amount of Subsidy required to make treatment cost of *Meloxicam* 20% cheaper compared to *Diclofenac* = **INR 25.0 Crores**

Estimate Health Cost due to decline in Vultures

- It is estimated that the Annual Health Cost from increase in rabies (based on morbidity and mortality costs of Rabies; Markandya et al, 2008) is between **INR 71-78 billion**
  (Rs. 7,100 – 7,800 Crores).

- **Above estimate does not include the cost of other diseases** (such as leptospirosis, anthrax) caused due to increase in rotting carcasses and increase in populations of other scavengers (such as rats) in the absence of vultures.

- Also, in the absence of inclusion of the range of values of ecosystem services received from vultures, the annual cost of loss in the species populations remains a significant under-estimate of the actual losses.

Conclusion

Given the shorter treatment duration and greater availability of Meloxicam (sold in 70% of pharmacies investigated during the course of the study by Cuthbert et al., 2011) amongst NSAIDs post the ban of veterinary use of *Diclofenac*, a subsidy aimed at bridging the cost difference between *Meloxicam* and *Human Diclofenac* treatments in favour of *Meloxicam*, coupled with greater efforts towards generating awareness amongst livestock owners, veterinarians and pharmacists to the detrimental nature of *Diclofenac* on vultures; there greater chances of success for switching over to *Meloxicam* as standard veterinary NSAID and phase out *Diclofenac*-use completely.

Also, given the high human health costs due to increasing incidence of diseases such as rabies (true cost being much higher if other diseases such as anthrax and other economic, livelihood and cultural benefits are also accounted for), it makes sense to invest a relatively smaller sum towards setting up an effective regulatory framework restricting access to *Human Diclofenac* for veterinary purposes and subsidising *Meloxicam*.

Pavan Sukhdev

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Sources:

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- Ministry of Environment & Forests, 2006, *Action Plan for Vulture Conservation in India*

- Richard J. Cuthbert, Ruchi Dave, Soumya Sunder Chakraborty, Sashi Kumar, Satya Prakash, Sachin P. Ranade and Vibhu Prakash, 2011, *Assessing the ongoing threat from veterinary non-steroidal anti-inflammatory drugs to Critically Endangered Gyps vultures in India*, Fauna & Flora International, Oryx, 45(3), 420–426.