

## Editorial

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In the cases of crop-raiding that I have seen, managers frequently ask the wrong question: how can we drive the elephants out of the fields and keep them out? Too often one hears administrators, and even wildlife managers, asking: how can elephants and people share the land? How can they co-exist? The simple fact is that farmers (that is, those who till the soil and cultivate crops) and elephants cannot co-exist. No matter how much effort one puts into finding the answer, if it is the wrong question then the problem cannot be solved. A better question would be: how can we keep elephants and farmers apart?

The ultimate goal is to minimize conflict between elephants and people. The problem of human-elephant conflict (HEC) can be addressed at three levels of prevention. The first is the primary structural issue: land use around the park. The second is the practice of farming and how to reduce the attraction of farms to elephants. The third is preventing elephants from stepping onto the farmer's field or, once there, how to drive them away.

*Primary prevention* is action to avoid the development of HEC in the first place. Elephants and agriculture do not mix, and therefore the goal of primary prevention is to separate elephant range from farmland. This addresses the root cause of HEC: both elephants and people need land, and most forms of agriculture either disturb the vegetation in a manner that is attractive to elephants or produce crops that they find palatable.

Primary prevention will usually involve some form of landscape management such as land use planning, wildlife corridors or buffer

zones to ensure that elephants and cultivators remain spatially separated. Buffer zones around protected areas can be managed for woodlots, unpalatable crops, fish-farming, hunting, and other activities that do not disturb the vegetation to make it attractive to elephants. In cases where crop raiding is already a fact of life, primary prevention will mean working with the local authorities to re-zone land use around protected areas. Admittedly, this will be difficult if farmers have already ensconced themselves close to the park.

Land use planning to separate people from elephants has long been recognized as not just the most effective method for addressing HEC but also the most sustainable. It addresses the roots of the crop raiding syndrome: that farmers and elephants cannot co-exist. However, managing the landscape for primary prevention is always politically difficult, requiring tortuous negotiations with all strata of rural society. Nevertheless, it is more cost-effective to adopt primary prevention methods today — and avoid the issue of crop raiding ever raising its ugly head — than to deal with angry farmers, and the politicians they mobilise, tomorrow.

Even if landscape management is successful in separating people and elephants, and even if large conservation areas are set aside for wildlife, there will always be some elephants that wander towards the farmland. The goal of *secondary prevention* is to minimize the attraction of each farm to such wandering elephants. Much can be done to reduce the risk of attack: avoid particular crop types, reduce the number of crop types, reduce field size, and place fields in clusters. The details will vary by vegetation type and by site and should be clarified by localized studies.

Landscape planning will reduce the frequency of elephants seen in the agricultural zone, and secondary prevention will reduce the attraction of each farm to those animals that do wander into the farmland. These two levels of prevention in combination will considerably reduce the risk to individual farms. For example, if primary prevention reduces movements into farmland by 50% and secondary measures reduce the attractiveness of each farm by 50%, then incursions will drop to only 25% of the earlier level. However, they will not eliminate HEC; there will still be that fraction of the elephant population not prevented by primary and secondary methods. Therefore the farmer must have methods for deterring and repelling elephants that step into his fief. These are the methods of *tertiary prevention*, and they include all the familiar tactics: banging drums, shooting in the air, firecrackers, smoke, home-made fences, capsicum sprays, capsicum-impregnated ropes, bee nests, etc. These tactics bring people in close contact with elephants and are often dangerous; those that cause pain may enrage elephants and enhance the risk of accidents. Therefore these tactics should be deployed only as the last line of defence, when all else has failed. If elephants learn to ignore them — as they often do — then there will be nothing left for us to fall back on.

In theory, primary and secondary tactics should be used together, and tertiary methods used only as a last resort. In practice, one must deal with the farmers' fears immediately, but the more frequently tertiary tactics are used, the less effective they become because elephants habituate to them.

It is unfortunate that managers and farmers usually see tertiary tactics as the only options available to them. But the widespread tendency to concentrate solely on tertiary methods should be avoided: they will not bring long-term peace to either farmers or elephants because they simply tackle the symptoms — just like giving aspirin to a cancer patient — and not the root cause of the problem. The consequence of relying on tertiary deterrents is that crop raiding persists, and farmers get angrier.

On the other hand, a sceptic could argue that land use management will not solve this issue. Elephants have evolved as wandering animals that range over large areas. Furthermore, given the space to do so, an elephant population is likely to expand to fill that space. There will always be those who press against the limits of the zone demarcated for their use. Beyond those limits they will find the secondarized farming landscape that is so attractive to a generalist feeder. One solution may be to shoot those animals that leave their legal range, for elephants soon learn where danger lies. Such a suggestion will delight the local populace that suffers from elephant depredations but often raises a storm of controversy and may anyway in some places be outside the law.

In many cases, particularly in Asia and West Africa, managers may think that tertiary tactics are the only option left because it is too late to manage the crowded landscape outside the protected area. While the opportunities for land use planning may be behind us in most Asian landscapes, there is still much that can be done to promote secondary prevention. Studies of the optimum distribution and types of crops and the arrangement of fields are still needed at the local level.



Elephant enjoying a bath (Sri Lanka)  
Photo by Prithiviraj Fernando