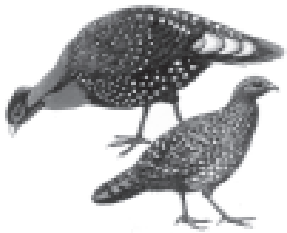
Mor

Newsletter of World Pheasant Association - India

Indian Peafowl
Pavo cristatus
National Bird
&
Odisha State Bird

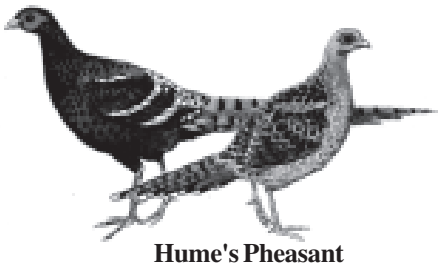
Himalayan Monal
Lophophorus impejanus
Uttarakhand State Bird



Western Tragopan
Tragopan melanocephalus
Himachal Pradesh State Bird

Blood Pheasant
Ithaginis cruentus
Sikkim State Bird

Blyth's Tragopan
Tragopan blythii
Nagaland State Bird



Hume's Pheasant
Syrmaticus humiae
Manipur and Mizoram
State Bird

National & State Birds

Mor *is the newsletter of WPA-India for private circulation. Its publication is being supported by the Duleep Matthai Nature Conservation Trust.*

Editorial

Among the Pheasants of the world, there is a distinctive genus of only five species that are collectively called Tragopans, also known as 'horned pheasants'. India is the sole country in the world to have four out of five of these species. These are very colourful and attractive birds. However, their status in the wild state is a matter of serious concern, as each species is in the 'vulnerable' or 'threatened' category. To know more about these birds, read the accompanying article by Shri Samar Singh.

In this context, 'conservation breeding' assumes special significance. So far, not much has been done in this direction within the country, except in Himachal Pradesh where some success has been achieved in recent years in respect of the Western Tragopan. Hence, the latest move with the support of the World Pheasant Association to send from the UK some Satyr and Temminck's Tragopan birds to the Darjeeling Zoo is a very welcome initiative. The article by Dr. John Corder in this issue of **Mor** provides an account of this significant development, the outcome of which has to be watched with much interest and expectation.

At the same time, the importance of *in situ* conservation has to be emphasized and the need to devote the utmost attention to the protection of the habitats of these birds must receive the attention that is required. There can be no getting away from this imperative. Needless to add that the State Governments in the Himalayan region and the North-East have a major role in this regard.

Dr. M. Shah Hussain, Hon. General Secretary, WPA-India

Pakidi – A heaven for Peafowl

The Pakidi hill range in Ganjam district of Odisha came to notice when the "Peacock Protection Committee of Pakidi" won the prestigious "Biju Patnaik Award for Wildlife Conservation" for the year 2006. This honor is further augmenting the aspiration of peafowl conservation among the people at Pakidi. Villagers from seven villages of this region are actively protecting peafowl and every body is concerned about the safety, food and water requirements of the bird population. Peafowl freely grazing the fields is a common sight at Pakidi. The attachment of villagers to the birds is intense and can be observed at its best when women and children provide water to the peafowl in pitchers, traveling several kilometers in the scorching heat of summer. This is done on a rotational basis, so every villager shares in the responsibility to protect the birds. The forest department has also played an important role in the facilitation of this initiative.

Source: Kalpvriksh, People in Conservation, Biodiversity Conservation and Livelihood Security, Volume 4 - Issue 3 - May - October 2012.

The Tragopan Quartet

by Samar Singh, former President, WPA – India.

India is the home of four out of five *Tragopans*, which makes it the only country in the world with such amazing natural endowment. These birds are essentially Asian pheasants of the genus *Tragopan* having five distinctive species. They are all stockily built, have short and stout bills, blunt tails and look quite neat and compact. The males sport fleshy horns on their heads that become fully erect during courtship displays. For this reason, these birds are also known as 'Horned Pheasants'. In the Greek language, *Tragos* means the male goat, and *Pan* stands for a Roman mythical figure half-man / half-goat. So, the Tragopan name is derived by combining these two words. Overall, the Tragopan males are pretty looking birds, very striking in appearance, mainly on account of the bright red, scarlet or flaming orange colours that dominate the plumage and the distinct white spots that cover most parts of their bodies.

The four Tragopan species found in India are the **Western Tragopan** (*Tragopan melanocephalus*), **Satyr Tragopan** (*Tragopan satyra*), **Blyth's Tragopan** (*Tragopan blythii*) and **Temminck's Tragopan** (*Tragopan temminckii*). The fifth species of the genus is called the **Cabot's Tragopan** (*Tragopan caboti*), which is found only in southeast China. It is not as attractive as the four species mentioned above. Besides, while these four are essentially Himalayan birds that inhabit high altitudes ranging from about 2000 to 4000 meters, the Cabot's Tragopan prefers evergreen and mixed forests at much lower altitudes around 1400-1500 meters.

Western Tragopan
Tragopan melanocephalus
(2500-3500m)

Satyr Tragopan
Tragopan satyra
(2500-3400m)

Temminck's Tragopan
Tragopan temminckii
(2500-3500m)

Blyth's Tragopan
Tragopan blythii
(1800-2300m)

The **Western Tragopan**, as the name denotes, is a bird of the Western Himalaya and is also known as the Western Horned Pheasant. Its current range extends from the northern parts of Pakistan to Kashmir, Ladakh and Himachal Pradesh and eastern part of Uttarakhand in India. During summer, the bird moves up to altitudes as high as 3600 meters and in winter it descends to areas at even 1400-1500 meters. It prefers well-wooded areas having Oak and Conifer trees, along with heavy undercover, in and near precipitous mountainsides. In view of this and also because of its very wary nature, sighting of the bird is indeed a difficult proposition. The female of the species is mottled brown, streaked, with white spots, and very dull as compared to the highly attractive male having blackish under- and upper-parts, contrasting with a scarlet nape, an orange-red breast, a prominent red patch around each eye, bluish horns and white spots all over the body. Another distinguishing feature of the male is its pink and purple blue bib-like throat skin that gets inflated during courtship display. Overall, the Western Tragopan is much darker than the other Tragopan species and has a very striking appearance. No wonder it is fondly called 'Jujurana' in Himachal Pradesh, which means 'King among Birds'.

There is, as yet, no definite estimate of the total population of the Western Tragopan. Rough calculations place the total figure at less than five thousand birds and it is fairly clear that the population has been declining due to habitat loss and other factors. In view of this and also because of the restricted range of the species, it is listed by the experts as 'vulnerable' and hence deserves very special attention. It is also noteworthy that efforts to breed the species in captivity in India and elsewhere have not been sucesssful. However, in recent years Himachal Pradesh has shown some noteworthy success through captive breeding at Sarahan.

The **Satyr Tragopan**, also called the Crimson Horned Pheasant or Crimson Tragopan, is essentially located in the Central Himalaya, but also extends into the Eastern Himalaya. Thus, it has a fairly wide range covering the States of Uttaranchal, Sikkim, West Bengal (northern region) and Arunachal Pradesh in India as well as Nepal and Bhutan. According to seasons, it moves from around 2000 meters in winter to about 4000 meters during summer. It is considered more numerous than the other Tragopans in the country, though exact estimates of the total population are not available. The male of the species is again very attractive and distinctive in its habitat. Its neck and under-parts are bright red or crimson, the upper-parts are brownish and the numerous round white spots extend up to the tail. The bluish fleshy horns and the bib-like throat skin also stand out. The female is smaller, largely rufous-brown and lacklustre, except for the whitish spotting on the under-parts and the blue orbital skin. Captive breeding of the species has been undertaken in some European countries with some success.

The Blyth's Tragopan is known to have two sub-species: *Tragopan blythii blythii* found in India (Arunachal Pradesh, Nagaland, Manipur and Mizoram), China and Myanmar, and *Tragopan blythii molesworthi* found in Bhutan and perhaps some adjoining parts of Arunachal Pradesh. Both sub-species inhabit areas at altitudes ranging from 1500 to 3000 meters depending on the season and prefer steep, well-wooded terrain. However, with the habitats having shrunk or becoming fragmented over the years, the species as such has certainly become rare. Hence, it is also placed by the experts in the 'vulnerable' category and merits special attention. As with the other Tragopans, the male of the species stands out, mainly on account of its typical white-spotted orange-red plumage and bright yellow facial skin and bib-like lappets (throat skin). Another distinguishing feature is that the under-parts are largely plain grey, which has given the

bird the name of the Grey-bellied Tragopan also. The female is mostly grey brown, mottled and also has white spots and yellow orbital skin.

Nagaland has declared the Blyth's Tragopan as its State Bird. It is also noteworthy that a few local communities in the State have taken the initiative of setting aside specific forest areas for the conservation of this species and these have been declared as Tragopan Sanctuaries. This is commendable and deserves all possible encouragement and support. Earlier, Nagaland was also able to achieve some success in captive breeding of these birds, but these efforts have not been sustained. The same applies to efforts made elsewhere, mostly in Europe.

Finally, the **Temminck's Tragopan**, which is found only in Arunachal Pradesh in India but has a fairly wide distribution in China and also occurs in Myanmar. It is also called the Chinese Crimson Horned Pheasant. Among the Tragopans, it is the most widespread and numerous, though its status in India is indeterminate and not much is known about the species. This is mainly on account of the remote and inaccessible terrain as well as the high altitudes where the species occurs. Its range varies from around 4200 meters during summer to about 2000 meters in winter. In appearance, Temminck's is much like the Satyr Tragopan and, in a sense, its eastern counterpart. However, the male of Temminck's is brighter red in the upper-parts, apart from having a distinct orange collar and pale grey streak-spots from the breast downwards. Besides, its facial skin is more cobalt blue and the lappets are larger than those of other Tragopans. No doubt, the dominant feature is the white-spotted red plumage, as in most Tragopan males.

It is worth mentioning that Arunachal Pradesh has the unique distinction of being the home of three Tragopan species: Blyth's, Satyr and Temminck's. No other region in the world, the size of this State, can claim this distinction. Another totally unique feature is that within Arunachal Pradesh there is an area in the West Kameng District bordering Bhutan from where all these three species have been reported.

The Tragopan species have some common characteristics that are worth mentioning. For instance, they are largely arboreal, which means that they frequent trees and even nest there. Sometimes they even use the nests of other birds. In this respect, the Tragopans are rather different from the other pheasants. Another common trait relates to their diet preference. The Tragopans are essentially vegetarian and clearly prefer seeds, grasses, leaves, berries, fruits, and other green stuff, though occasionally they also partake of small insects. Perhaps the most interesting feature concerns the courtship displays of the Tragopan males. As already mentioned, the males of all the species have fleshy erectile horns on their heads and colourful bib-like throat skin or lappets. These get greatly inflated during the courtship display of the male, when the bird looks somewhat like a knight in armour. The sight of the fully enlarged lappets and the horns fully erect is truly amazing and has to be seen to be believed. Interestingly, the male has to get behind some small structure, such as a small rock or boulder or a log of wood, at some distance from the female, and then, from behind that structure, the amazing show is put on to attract the female. The existence of such conditions is crucial for the successful breeding of these birds, according to Dr. John Corder, International Vice President of WPA, whose expertise in the subject is well recognised.

Undoubtedly, the Tragopans are very special creatures that stand in a class of their own. And, India is certainly fortunate to have four out of a possible five species of this group of birds. All the more reason to devote the fullest care and attention to ensure their conservation for posterity.

WPA sends Tragopans to India

Article by Dr John Corder, WPA Vice President, and an acknowledged expert on conservation breeding of Pheasants. He has been advising Himachal Forest Department for some years.

About six years ago, wildlife authorities in India realised that the number of tigers remaining in the country was far fewer than had previously been believed and that poaching and illegal hunting had reduced this species to a dangerously low position. Indeed the number of tigers in captivity far exceeds the number in the wild.

The Indian Government decided that such a tragedy should not befall other threatened wildlife species. The decision was taken to reinforce existing conservation breeding programmes for the most threatened Indian species or, where these programmes did not exist, to establish new programmes so that wild populations might be reinforced at some stage in the future, if required. The Government determined that breeding centres would be established for each species and the founding populations would be sufficiently large that inbreeding would not be a problem in the future. For most species, a founding population of around a hundred unrelated animals is considered to be the minimum required to maintain genetic diversity.

In India, the Government has a statutory organisation within the Ministry of Environment and Forests to regulate all zoos and places where animals are held in captivity; this organisation is called The Central Zoo Authority (CZA). CZA was given the responsibility for drawing up a list of threatened Indian species needing support, and for co-ordinating the various conservation breeding programmes. At this, stage-sixty three different species were identified, including thirteen breeds of pheasants. Some of these species already have existing international conservation breeding programmes co-ordinated through studbooks. Amongst these are Indian rhinos, snow leopards and tigers. Few programmes exist within India, but one that did was for the Western Tragopan in Himachal Pradesh, a north Indian Himalayan State.

The Wildlife Division of Himachal's Forest Department had established a rescue centre for the Western Tragopan near the village of Sarahan at an altitude of more than 6000 feet. This species has never bred well in captivity and the only captive breeding in the whole 20th century was a male hatched at Sarahan in 1993. WPA became involved in helping at Sarahan in 2002 and offered much training and advice, particularly with the support of Mr. James Goodhart and the Pheasant Specialist Group. Gradually, expertise developed at Sarahan and aviaries and diet were improved, so that the species began to breed in small numbers, culminating in nine young being raised to adulthood in 2007.

In February 2008, CZA convened an international conference in Delhi where experts on breeding Indian species from around the world were invited to help formulate plans for each of the threatened species. IUCN's Conservation Breeding Specialist Group played a significant role in advising which key personnel should attend. WPA was invited, particularly because of the success that had been achieved within India on a comparatively small budget with the Western Tragopan.

The Satyr tragopan is found in India's central Himalayan region and appears to be diminishing in numbers; Temminck's tragopan is very rare in the extreme northeast of the country, in areas adjacent to the border with China. Historic records show that many Satyrs and a few Temmincks had been taken from the wild to be put in zoos, but the majority of these birds died from stress quite quickly. Birds that were taken to the heat of the Indian plains seldom lived long. During the 2008 conference, it was decided that programmes for these two species should be centred in two Himalayan zoos in Darjeeling (West Bengal) and Gangtok (Sikkim). However, it was recognised that there were two major problems before such programmes could commence. Firstly, staff at the zoos did not have the expertise to breed the pheasants they currently exhibited,

and secondly, the high mortality of wild-caught birds was a major concern because capturing these birds might result in the total loss of the species.

It was proposed that zoos scheduled to hold Tragopans should have training from WPA and that perhaps WPA might donate captive birds to avoid the need to take any birds from the wild.

After a few months, a 3 days training workshop was held at the Darjeeling Zoo for zoos in India that would hold threatened pheasant species. WPA played a key role in this workshop, as did the Himachal Pradesh staff Alam Singh and SatPal Dhiman who were running the successful Western Tragopan and Cheer pheasant conservation breeding projects. In addition, we worked closely with the staff at Darjeeling Zoo, so that within a year they were parent-rearing all seven pheasant species that they held at that time.

At this stage, the European Conservation Breeding Group (ECBG) of WPA was asked to donate 4 pairs of Temminck's tragopans and two pairs of Satyr tragopans to help start the conservation breeding programme in Darjeeling Zoo. We proposed this project to the European Zoos (EAZA) Galliformes TAG and several European zoos expressed an interest in becoming involved. One of these, Paradise Wildlife Park in Hertfordshire, kindly agreed to construct special quarantine aviaries to hold the birds before transportation to India.

Tragopans were donated free of any charge by Thomas Wyrwoll (WPA Germany), Sparsholt College (UK), Paradise Wildlife Park, Bernard Giboin (WPA France), Antwerp Zoo, The Pheasant Foundation (UK), and WPA-UK members Stephen Jacques, Keith Chalmers Watson and John Corder (UK).

After many discussions with defra's Animal Health Department, it appeared that export permits for the birds to travel to India were agreed, so the birds were placed in quarantine in June 2010. However, it was over a year before the final export licences were finally agreed and issued. We are all immensely grateful to all the staff at Paradise Wildlife Park, particularly to Peter Sansom & Lynn Whitnall (Owner & Director) who ended up holding the birds for more than a year. Fortunately, they had constructed very nice grassy aviaries so quarantine was not difficult for the birds.

The Tragopans needed to fly to Calcutta as this is the closest airport to Darjeeling Zoo, the eventual destination of the birds after Indian quarantine. No airline would agree to fly the birds directly from the UK to Calcutta, so the specialist animal transport agents arranged for the birds to travel via Singapore at the end of July 2011. All the birds travelled in specially constructed boxes, made to specific IATA requirements, with access to food and water and with good ventilation. Sadly, the birds were delayed for a number of hours in transit at Singapore airport and were almost certainly left exposed to tropical conditions for a number of hours. By the time they arrived at Calcutta, half of the birds had died, including 5 of the 6 males. Immediate post mortems revealed that the birds had been dead for 6 or 7 hours and that they were all severely dehydrated. None of the water bowls, which were filled in London, contained drinking water so they could not have been monitored in Singapore. The remaining 6 birds completed their quarantine in Calcutta and then moved to Darjeeling Zoo. Since that time, obviously we have tried to determine why the birds were not provided with water either by the Singaporean authorities or the transporting agents, but no satisfactory response has been offered.

CZA asked ECBG to see whether we might be able to offer some replacement Tragopans, particularly males, so that they could start their breeding programme. It has taken more than a year to put together another group and these birds were assembled during the year at Fenton Barns, thanks to the kind support of Keith Chalmers Watson. All the birds were donated by WPA UK members Keith Chalmers Watson, Jimmy Reekie, Billy Wilson, Stephen Jacques, The Pheasant Foundation, Jim Waring and John Corder. Gary Robbins, Simon Mayes and Nigel Hester all played significant roles in raising and transporting the birds.

WPA has a special relationship with the Royal Zoological Society of Scotland, which runs Edinburgh Zoo and the Highland Wildlife Park. Three Satyr and six Temminck's tragopans entered quarantine at the Highland Wildlife Park early in December after Lynda Burrill from RZSS had spent many days helping to put the correct paperwork in place. Lynda's expertise in moving penguins around the world has proved invaluable. Douglas Richardson and his staff at The Highland Wildlife Park have already quarantined successfully the Bornean peacock pheasants that were imported for WPA last year, and we appreciate greatly all the care and expertise that they are giving our tragopans.

The nine birds are scheduled to fly to Calcutta from Edinburgh Airport using a different route than the previous group. Everyone involved is very aware of the disasters of the previous export so we are hopeful that the tragopans will reach India safely in the middle of January. New aviaries have been constructed for them in a special off-site facility - these aviaries are extremely large and specifically designed for tragopans, with large areas of grass, several trees and good night shelters. Experienced pheasant keepers will look after them and WPA will monitor progress.

The target is for the zoo to learn the skills of raising tragopans using the birds from Europe. The aim is to try and get the birds to rear their own young. When pairs have managed parent-rearing successfully, the following breeding season they will be provided with eggs taken from wild nests in India. These eggs, when hatched, will become the founding members of the Indian conservation breeding programme and, because they will be raised in captivity, they should not suffer from stress in the same way as wild caught adult birds have done in the past.

The formula for using well-adapted captive birds to parent-rear young using eggs from wild nests has already been used very successfully in Himachal Pradesh to found their current conservation programme for the Cheer pheasant. In Himachal, all seven pairs in the Cheer breeding programme parent-reared young this year so the whole future breeding programme is now running using birds with direct wild origins.

WPA and the Indian Central Zoo Authority are developing a methodology for threatened pheasant species, which could result in securing the future for many species in the wild. Moreover, this programme will not take any birds from the wild to increase pressure on the species. We know from practical experience that pheasant hens seldom manage to keep many of their young alive in the first few days of their lives, so by taking some of the eggs from a nest, we are probably allowing the hen to concentrate her efforts on a smaller number of young with a greater likelihood of the birds she is caring for surviving to adulthood.

Let us hope this conservation strategy can help secure the future of these two Tragopan species in India, and many thanks to everyone concerned for all the time, effort and money they have donated. Surely this is just the sort of conservation effort that only WPA members could manage.

The 13 Indian pheasant species identified for conservation breeding: Himalayan monal; Blood pheasant; Cheer; Hume's; Grey peacock-pheasant; Sclater's monal; Tibetan eared pheasant; Temminck's tragopan; Blyth's tragopan, Western tragopan; Satyr tragopan; Grey junglefowl and Red junglefowl.

The Western Tragopan in Himachal Pradesh

by: Samhita Bose, Wildlife Institute of India, Dehradun

Western Tragopan *(Tragopan melanocephalus)*, is among the rarest of pheasants and occurs in the temperate region of the Himalayas. It is one of the five extant species of Tragopans under the family *Phasianidae*, that are restricted to south east Asia. As the name suggests, it has the western most distribution range from Hazara in Pakistan in the west up to Garhwal in the east. Like most other Himalayan pheasants, the knowledge of this bird is sketchy. A series of extensive studies lately have thrown some light on its ecology, current distribution pattern and population trend.

The project 'Reproductive Biology and Behaviour of Captive and Wild Populations of Western Tragopan in Himachal Pradesh' being carried out by the Wildlife Institute of India aims to understand the ecology and breeding behaviour of these birds both in captivity and the wild. The in-situ component of the current project encompasses the long term project goal of releasing the captive reared birds in suitable habitats with historical presence. But this has to be done very carefully as reintroduction of any species needs to be done after proper groundwork following the rules of IUCN to maximize the survival chances of the reintroduced individual(s).

The major challenge for the reintroduction of these birds lies in understanding the complete behavioural response of these birds in wild, which is challenging given the secretive nature and the difficult terrain they inhabit. At this preliminary stage, an extensive survey of the available literature is being done to get an idea of the population trends and patterns of this bird and the conservation status in wild. Also, a series of workshops have been held in the districts of Sirmaur, Shimla, Kullu, Kangra, Chamba and Kinnaur (districts where these birds are found) to give the forest guards hands-on-training on how to conduct surveys for an elusive pheasant in the wild. Further workshops will be conducted to give thorough insight on the survey methods and use of instruments like call recorder and GPS to generate quality data from the wild state. The project finally aims at conducting a state-wide survey of this bird in Himachal Pradesh to get a proper population estimate of the bird in the wild and also to identify potential release sites for the captive reared birds and host awareness programmes on the need for conservation of this vulnerable pheasant.

Documents as early as 1862 (Jerdon) reported the distribution of Western Tragopan to be ranging from Hazara in northern Pakistan through Kashmir and Himachal Pradesh to Garhwal and possibly Kumaon in Uttarakhand, India. It occupied a habitat range 700 km long and 50-100 km wide stretching along the Himalaya. However, Sharma in 1993 reported complete absence of the species from several outer mountain areas which were previously inhabited by the birds. Garson in 1983 reported two major breeding populations of the pheasant; the Neelum or Kishenganga Valley and adjacent areas of Pakistan and the Kishtwar National Park in the Chenab Valley of Kashmir and estimated the wild population to be ranging between 1600-4800 birds. Being a habitat specialist, this bird was known to be scarce and localised in mixed conifer forest, mixed broadleaf forest and broadleaf forest even during the start of the nineteenth century. However, such low population estimation of the birds in the wild reported by Garson brought the conservation status of the bird to be revised and a number of studies to assess the proper population estimation and habitat use have been taken up since. The studies, and the detection of a large breeding population (about 1000 birds) in Palas, Pakistan, have taken up the population estimation of the birds to a modest 6000 (approximately). Currently the range has diminished considerably with only 2,000-3,000 sq. km area of potential habitat being available and the present population is distributed in five fragmented units: (1) Neelam Valley, (2) Kishtwar National Park and (3) Palas in Jammu and Kashmir, (4) Kulu (including Great Himalayan National Park) in Himachal Pradesh and (5) Bhilinguna in Garhwal, Uttarakhand.

The data obtained from the initial survey of a few selected beats in the protected areas of Rupi-Bhawa WLS and Daranghati WLS was used to generate a coarse distribution model of the Western Tragopan in the entire state of Himachal and it is evident from the model that despite a larger range of potential habitat

being available, the birds are seen to exploit only a minor portion of the potential habitat. The factors behind this need to be probed into.

Representing the endemic bird area D02 (Western Himalaya), Western Tragopan has been described as a range-restricted species (ICBP 1992). The species is also listed as 'Vulnerable' (VU) C2a (i) in IUCN Red Data List (2011) and Schedule I of the Indian Wildlife Protection Act, 1972. A habitat specialist, threatened by habitat destruction and with only five fragmented wild populations, this species faces potential risk of extinction in the wild state. The major cause for the decline of the species is the anthropogenic pressures like grazing and collection of mushroom and firewood. With a steady increase in human population in these remote areas, anthropogenic pressure also seems to be on the rise. The rise in economic value of mushroom in international market and a search for livelihood in the challenging terrain is the major cause behind this. The problem is made worse by the breeding season of the birds coinciding with the season for mushroom collection. And it has been reported by local people that some of them even steal pheasant eggs during the mushroom hunt. So, by engaging local people to keep a vigil, such illegal activities can be checked. Also, by arranging awareness programmes about the importance of conservation of Western Tragopan, the local people should be persuaded to shift their season of mushroom collection . Furthermore, the implementation of recovery plan and reintroduction of certain captive birds in wild and their monitoring to understand their habitat utilization and behaviour in the wild may put a stop to this declining trend of the population of the Western Tragopan.

Pesticides, Farm Ecosystems and the Blue Peafowl

by Anita Chauhan

Incidents of mortality of blue peafowl from pesticide poisoning in agricultural fields in India are frequently reported in newspapers. A summary of the practice of pesticide-use, its effect on the ecosystem, and Integrated Pest Management technology in India is presented here, so that readers are able to understand how pesticides are affecting farm ecosystems and what is being done by the government to check the havoc caused by the harmful chemicals. Many types of pesticides are used in agricultural ecosystems. Earlier, inorganic compounds of copper, zinc, arsenic etc were used for crop protection. With the discovery of organochlorines in the 20th century, organic compounds such as DDT, Heptachlor and Aldrin were used. However, the use of many organochlorines was later banned as they were found to have a slow decomposition rate in the environment due to which bioaccumulation and biomagnifications took place, affecting several species in the food-chain. The next group of chemicals, called organophosphates, such as Parathion and Malathion were introduced, which are very toxic and yet are quickly decomposed in the environment. However, these are extremely toxic to humans and to beneficial organisms as well. Carbamates and Herbicides are the two other categories of chemicals that have been added to the toxic list. On the biotechnology front, the use of recombinant DNA technology has allowed the production of genetically modified crops (for example, Bt Cotton), that kill the pests that feed on its tissues.

The crops grown in India are classified as Fibers, Cereals, Pulses, Oil Crop, Vegetables and Fruits. About 70% of the total pesticides used are applied to the cotton crop and 20% to the rice crop. The Indian states that are the major consumers of pesticides are Andhra Pradesh, Punjab, Karnataka, Tamilnadu, Maharashtra, Haryana, Gujarat and Uttar Pradesh. Consequently, most of the peacock mortality due to poisoning is reported from these states. Pesticides are applied in the form of sprays, dusts and aerosols, to kill a variety of pests – insects, nematodes, bacteria, viruses, fungi, rodents and weeds. These are applied to the seeds, foliage and fruits/vegetables, and also mixed with soil to kill harmful soil fungi and nematodes.

The residues of pesticides and their metabolites cause surface water, groundwater, soil and air pollution. Many types of birds that are associated with farm ecosystems are also affected by toxic chemicals. These include waterfowl (ducks, geese, and cranes), plant eating game birds (pheasants, partridges, quail), seed and insect eating birds, and predatory birds. Other animals affected by pesticide pollution include useful soil

microbes, fish, amphibians, earthworms, insects (bees, spiders, butterflies, moths, beetles, dragonflies) and mammals. The modes of poisoning are direct contact/inhalation of dust, insect prey laden with pesticide, fish and mammalian prey laden with pesticides, and algae and herbs sprayed with pesticides. In a study conducted in Keoladeo Ghana National Park, pesticide residues and metabolites were found in the soil from the agricultural fields in the vicinity of the park, as well as soils inside the park which receives run-off from the fields. Therefore, legislation for a buffer zone that uses minimum synthetic pesticides, in the vicinity of protected areas may be required. Pesticides have a negative effect on human health. They are deleterious to the immune system and endocrine system, and reduce the haemoglobin level in the blood. They can cause congenital abnormalities, legions, paralysis and cancer.

Due to the severe problems caused by toxic pesticides, a new system of crop protection, called 'Integrated Pest Management' is being advocated globally, that, when combined with reduced conventional pesticide use, is able to give a more sustainable output, especially when the intangible benefits to the environment and human health are factored in. Pesticides are targeted towards killing insect pests in the larva, nymph or adult stages of their life cycle. Types of insect pests include beetles, butterflies, moths, mealybugs, termites, crickets and mites. Soil dwelling nematodes also cause crop damage. Fungi, bacteria and viruses cause plant diseases. Weeds and rodents cause a decrease in productivity. Intensive form of farming has made it simpler to spray large quantities of pesticides over a large area. However, many pest and pathogen species are developing resistance to the pesticides, requiring heavier and newer pesticide application in the fields. This is causing further havoc to the farm ecosystem, as pesticides destroy useful pollinating and predatory insects as well, causing a resurgence of resistant pests. Insects resistant to Bt Cotton are now affecting cotton crops. Therefore, new types of pesticides that mimic natural chemicals produced by plants are now being used. These include biopesticides derived from the Neem tree, synthetic Pyrethroids and Nicotinoids. In low concentrations, biopesticides are broken down by enzymes in the human body, rendering them harmless to humans, and yet they are effective against pests. In high concentrations however, biopesticides are toxic to humans.

Biocontrol of insect pests by releasing predatory, parasitoid and pathogenic insects as a means of control is being practiced for several types of crops. Farmland birds also control insect populations. Pheromone traps to lure moth pests are being successfully used in fields. Other cropping methods, such as trap cropping with marigold plants that are toxic to soil nematodes that feed on crop roots, and strip cropping with native plants that provide cover and food to useful insects, are advocated. The use of reflective shinning ribbons in the crop fields as a deterrent to peacocks has been tried successfully in Tamilnadu.

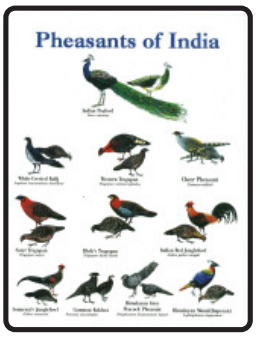
Presently, only 2% of agricultural land in India is under the IPM system. IPM technologies have been developed by the National Center for Integrated Pest Management of ICAR in the Ministry of Agriculture. NCIPM also maintains a crop pest database, and conducts pest and disease surveillance and advisory projects. Farmers should use a combination of IPM methods and the correct concentration and method of spraying pesticides in the field. Though initially the IPM system was costlier than conventional pesticide use, in Tamilnadu and Gujarat, IPM has resulted in economic benefits to the farmers. IPM packages for individual crops have been developed. There is a need to increase the outreach activities and take this technology to the farmers so that they can switch to the IPM system.

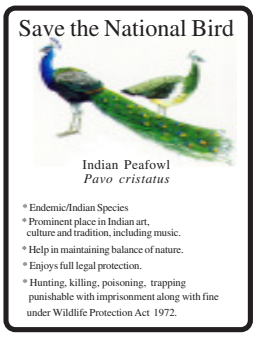
Developed countries such as Canada, USA and UK also have regulatory organisations to minimize damage to wildlife due to toxic pesticides, and advise farmers on correct pesticide use. A new urban trend of weekend Farmer's Market and organic products, in cities such as Bangalore, Mumbai and New Delhi, encourages people to grow pesticide-free vegetables and fruits in their backyards. This is a healthy trend away from intensive farming which requires large-scale use of pesticides. Hopefully, it will also cause wider use of IPM technologies in bigger farms. To quote Rachel Carson, the author of the celebrated book 'Silent Spring' – " …the chemical war is never won, and all life is caught in its violent crossfire." We have to aim to restore the farm ecosystem with its 'built-in checks and balances' to keep pests under control. Only then can we ensure that our countryside will be alive with the healthy sound of songbirds and peafowls.

Resource Material - *available on request*

Posters

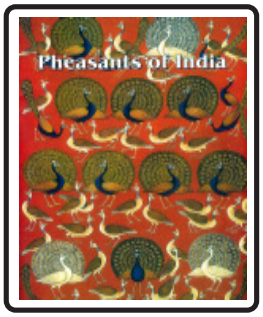
- Pheasants of India
- Pheasants of Arunachal Pradesh
- Pheasants of Himachal Pradesh
- Pheasants of Uttarakhand
- Pheasants of Assam
- Pheasants of J&K
- Pheasants of Sikkim
- Pheasants of Nagaland
- Pheasants of West Bengal
- National and State Birds
- Save the National Bird
- Himalayan Monal

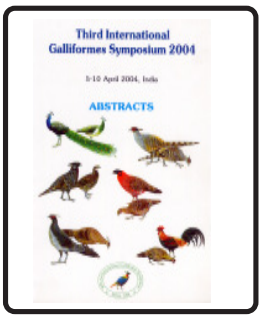


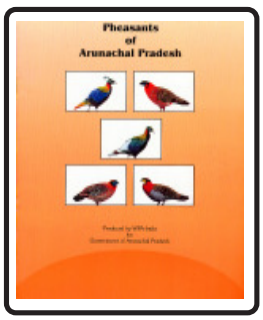


Booklets

- Pheasants of India
- Pheasants of Arunachal Pradesh
- Third International Galliformes
- Symposium Abstracts
- Pheasants of Himachal Pradesh







Join WPA-India -- --only national organization wholly devoted to the cause of galliformes conservation in India. Membership involves a nominal fee.

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