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STATUS OF WEEDS AROUND SELECTED WATERHOLES OF BARNAWAPARA SANCTUARY(C.G.)

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ABSTRACT

Weeds have received less attention in Protected Areas of Chhattisgarh. This might be due to more emphasis on wildlife protection, rather than a broader science based approach to conservation of biodiversity and ecosystem functioning. A literature review of invasive plant species in India revealed that only 20% of studies have been done from protected areas out of all since 2000. Studies from protected areas have largely focused on single species *Lantana camara*.

Chhattisgarh has around 44% of forest cover and it is also rich in biodiversity, wildlife and medicinal plants. Good rainfall & climate contributes in floral richness. But due to increase in human population and cattle there is pressure on forests and its diversity. This also encourages weed infestation. National parks and sanctuaries also face weed problems. There is a need to access the problem and take steps to mitigate it, so that harmful impacts can be minimised.

Study area in Barnawapara Wildlife Sanctuary has shown presence of 5 species of weeds around selected waterholes (Core, Buffer & relocated village area).

Keywords- National park, sanctuary, biodiversity, invasive species, weed, *Lantana camara*, core zone , buffer zone.

I. INTRODUCTION OF STUDY AREA

Bar-Nawapara Wild Life Sanctuary geographically nestes between 80°-22'-30" to 82° 37' 30" East longitude and 21° 18' 45" to 21° 30' 0" North latitude. The sanctuary is located in Balodabazar district of Chhattisgarh having an area of 235 Sq. KM. It is named after "Bar" and "Nawapara" forest villages, which are in the 'heart' of the Sanctuary. This wilderness encompasses land mass of undulating terrain, dotted with numerous low and high forested hillocks, at North Eastern corner of Raipur District of Chhattisgarh. The tributaries of Mahanadi river "Balamdehi" forms the western boundry and river "Jonk" forms the north-eastern boundary of the Sanctuary.

The forests of the sanctuary can be classified as Teak, Sal and mixed forests. Forest comprises of the grand timber tree ie. Teak (*Tectona grandis*) with other species like Saja (*Terminalia tomentosa*), Bija (*Pterocarpus marsupium*), Ledia (*Lagerstroemia parviflora*), Haldu (*Adina cordifolia*), Dhaora (*Anogeissus latifolia*), Salai (*Boswellia serrata*), Aonla (*Emblica officinalis*), Amaltas (*Cassia fistula*) etc. The ground is covered with different types of grass, herbs, shrubs, bushes and saplings. Many medicinal plants are also found in the area. Weeds like *lantana camara* and parthenium has been seen in the protected areas. Studies from protected areas have largely focused on single species *Lantana camara*.

River, Streams and Tanks : - Balamdehi river forms the western boundary of Bar Nawapara Santctuary, which is not perennial. The area encompasses a large number of seasonal small rivers, most of them retain water up to December/March. Seasonal small rivers are full of water till

September but from October onwards they start drying up. Water is retained in the form of scattered pools throughout the sanctuary. Comparatively bigger seasonal small rivers like Nuncha, Dokar bahal, *Dr.K.R.Sahu,Asst. Prof. of Zoology:Govt. E.R.R.P.G.Science College, Bilaspur,C.G.495006

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Kantra, Marghat, Debhar, Mahkam nallah Chingaria nallah, Chanda-dai, and Sukhi nallah are also present.

Tanks are earthen or masonry structure, which stores rainwater in sufficient quantities for long duration. Many earthen tanks are constructed by the Forest Department, throughout the Sanctuary. These tanks provide daily uses to the villagers and drinking water to wildlife. Two irrigation tanks are situated near Amgaon & Dond in compartment FD 113, FD 148 and FD 186 respectively. Theoretically 65 water holes exits in an area of 244.66 Sq. km. As an average one water source is present in every 3.76 Sq. km. area.

Zonation :- To fulfil the objectives of Wild Life Management in Sanctuary, the area is divided into following zones :-

- 1. Core Zone :-**The core area is the heart of the sanctuary. It is rich in wildlife and consists of 22 compartment having an area of 45089454 hectares. The area comprises of second and third quality miscellaneous forests, Sal with bamboo intermix and form Core Zone.
- 2. Buffer Zone :-**Buffer Zone surrounds the Core-Zone. It is a multipurpose area where cattle grazing, nistar and other requirement of villagers residing in the forest village are met with.

II. METHODOLOGY

The present research was carried out during January 2013-April 2015 in Barnawapara Wildlife Sanctuary, Baloda Bajar, CG, India, to explore the presence of weeds around selected waterholes of the sanctuary. The study area was divided into 3 parts, Core zone, Buffer zone & village relocation zone. Waterholes were selected in each zone for the study. Survey was conducted on all four directions of the waterholes putting linear rectangular grid of 2mts. X 2mts. at the spacing of 10, 20 & 30 mts. each. Random sampling was done in each 2mtr. X 2mtr. grid to access distribution of weeds. Identification of weeds was done by available literature inducing flora /encyclopaedia and with the help of field's experts.

List of waterholes where study was conducted.

Zone	Compartment number/Name	GPS Location
Core	Comp. No. 109 Pond	N 21 0 26' 21.9" / E 082 0 25' 59.7"
Village Relocated Area	Comp No 161 Pond	N 21 0 26' 21.9" / E 082 0 25' 59.7"
Buffer	FD 168 Nakti Pond	N 21 0 23' 31.0" / E 082 0 25' 13.1"

Grid: - Compartment No. 109, 161, FD168 (See Annexure I)

Result:- Five species of weeds were found in the grid around different waterholes of the study area. Details are given below:-

Zone	Compartment number / Name of study area	Name of weeds found in the grid around waterholes	% of weeds infestation found in the grid around waterholes
Core Zone	Comp. No. 109 Pond	<i>Ageratum, Hyptis</i>	5.33%
Village Relocated Area	Comp No 161 Pond	<i>Ageratum, Hyptis, Ludwigia,</i>	8.47%
Buffer Zone	FD 168 Nakti Pond	<i>Ageratum, Hyptis, Chromelina odorata, Eupetorium</i>	15.45%

There is floral richness around selected waterholes in Core, Buffer & Relocated Village Area but it also shows presence of 5 species of weed plants. Core zone has 2 species *Ageratum, Hyptis*, whereas waterhole of relocated village Rampur has 3 species and buffer areas have all the 4 species of weeds.

III. CONCLUSION

Study clearly shows presence of weeds around selected waterholes in core, buffer & relocated village area. Presence of weeds mostly depends on percentage of biotic pressure and conservation measures undertaken. 5 species of weeds namely *Ageratum, Hyptis, Ludwigia, Eupetorium & Chromelina odorata* was found in the selected waterholes of the study area. *Ageratum* and *Hyptis* were found in core, whereas relocated village Rampur and area around waterholes of buffer areas have all 5 species of weeds ie *Ageratum, Hyptis, Ludwigia, Eupetorium & Chromelina odorata*.

The above chart clearly shows that core area has less weed infestation (5.33%) whereas buffer & relocated village area have more infestation 8.47% and 15.45%. Presence of less weeds in core area was due to strict

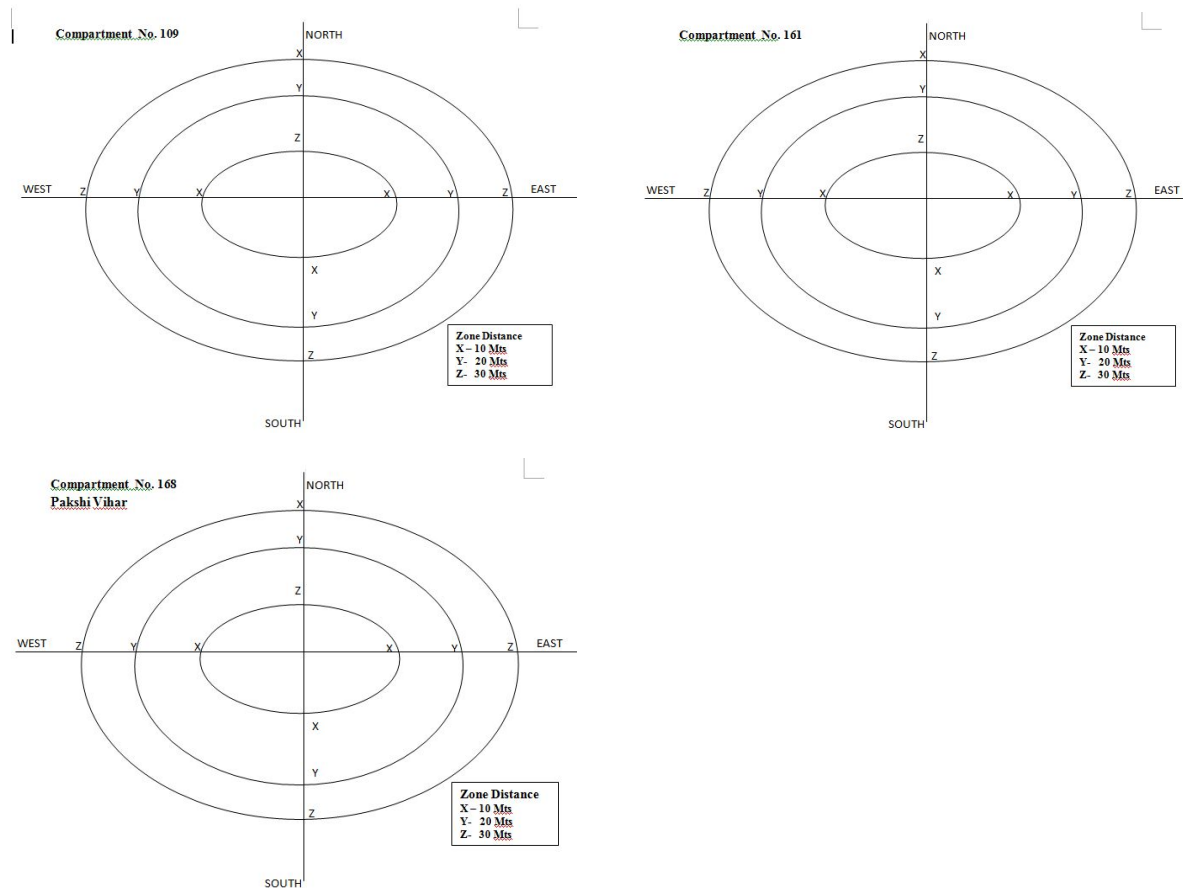
protection measures and less biotic pressure, whereas weeds were more in village relocated area and buffer areas was due to more biotic pressure and grazing.

Relocated village area has less percentage of weed infestation than buffer areas because, villages were shifted and biotic pressure has decreased. Due to decrease in biotic pressure palatable grasses and regeneration has increased resulting decrease in weeds. Thus gives the opportunity nature re-equips its floral density and diversity.

Documentation and identification of weeds in the sanctuary and its invasive intensity in the field will be helpful in making conservation strategies. Wildlife managers can plan to prevent/ eradicate such invasive species for increasing fodder species for herbivores. Earlier studies and present day research data will help in scientific wildlife management in protected areas.

(Annexure I)

Diagram of layout of grid around waterholes in compartment No. 109, 161, FD168



	East Zone	West Zone	North Zone	South Zone
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Comp . No. 109 Talab	X :- Ageratum, Hyptis, 15% Y:- NIL Z:- Ageratum conizoides, 20%	X :- Ageratum, Hyptis suaveolens, 0.5% Y:- Ageratum 1% Z:- Ageratum 3%	X :- Ageratum 1.5%, Y:- Ageratum 2%, Z:- Ageratum 2%	X :- Hyptis 2 % Y:- Ageratum coniyzoides 15% Z:- Ageratum coniyzoides 2%
Comp . No. 161 Talab	X :- NIL Y:- NIL Z:- NIL	X :- Hyptis 2% Y:- Hyptis 50% Z:- NIL	X :- Ageratum, Hyptis 1% Y:- Ageratum, Hyptis 3% Z:- Ageratum, Hyptis 3%	X :- Ageratum 1% Y:- Ageratum, Hyptis 2% Z:- Ageratum, Ludwigia, 40%
Comp . No. FD16 8 Nakti Talab	X :- Hyptis, Ageratum, 10% Y:- Ageratum, Eupetorium, 15% Z:- Ageratum 10%	X :- Ageratum 15% Y:- Ageratum, Hyptis, 2% Z:- Ageratum 3%	X :- Hyptis, Ageratum, Eupatorium, 45% Y:- Hyptis, Ageratum, 40% Z:- Hyptis, Ageratum, Eupatorium, 30%	X :- Hyptis, Ageratum, 2% Y:- Ageratum, 2% Z:- Ageratum, 12%

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