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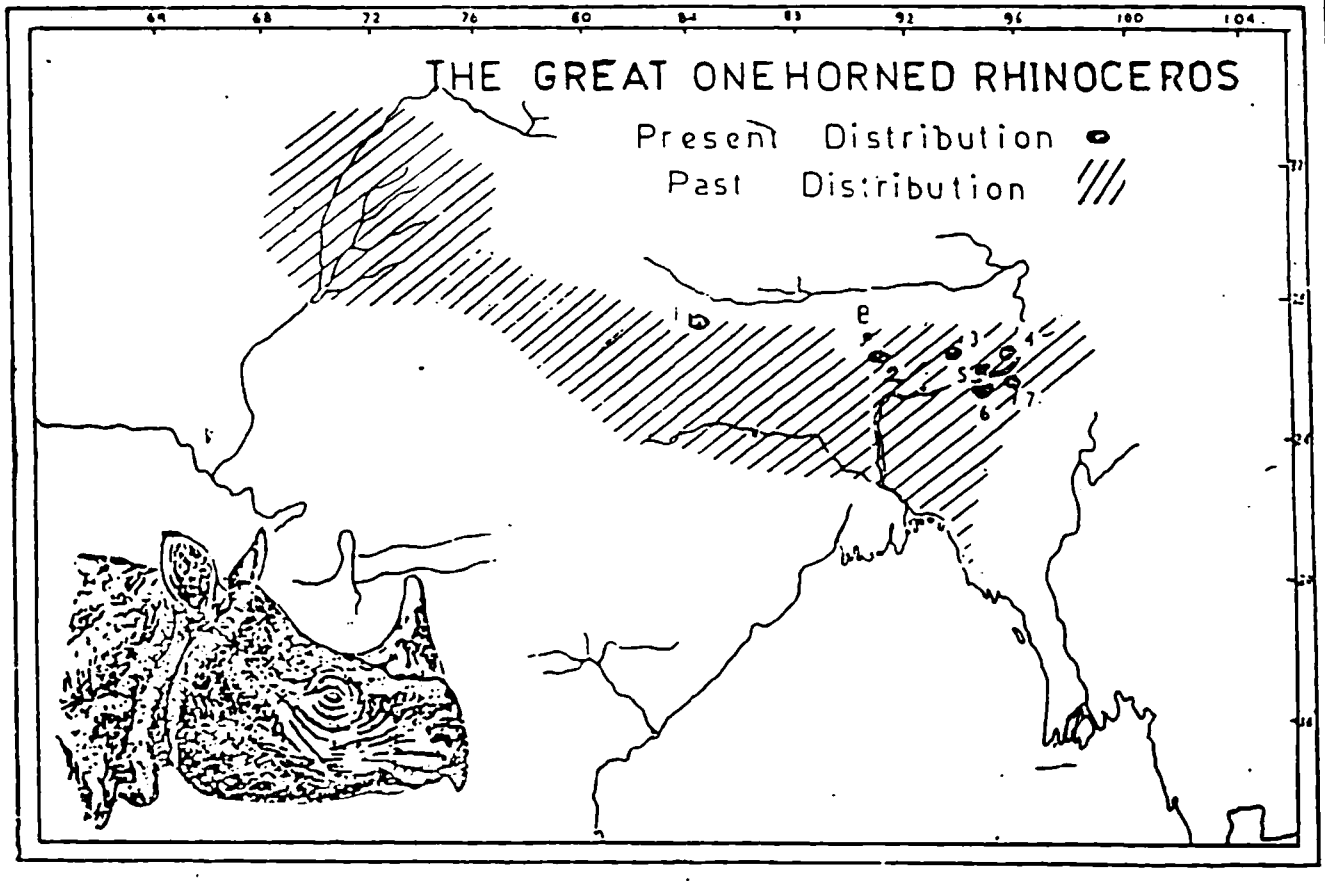
SECTION 5
INDIA RHINO ACTION PLAN

RHINO CONSERVATION ACTION PLAN



1. Chitawan. 2. Jaldapara. 3. Manas. 4. Sonairupa. 5. Orang. 6. Kaziranga. 7. Laokhowa. 8. Gorumara.

Ministry of Environment & Forests
Governement of India

PREFACE

The Great Indian One Horned Rhino had been brought back from almost the threshold of extinction through sheer hard toil, backed up by a determination, dedication and political as also popular support, which is quite rare. By the early eighties it was felt that the Indian Rhino was probably safe. Arguments came up about the Rhino even crossing its carrying capacity in some areas, where its number had gone up spectacularly. Translocation and reintroduction of the Rhino took place in Dudhwa, where it had disappeared nearly 200 years ago.

But since the late eighties things started going down hill again. Despite ban on international trade in Rhino horns, poaching of the Rhino in India took an ever increasing toll, once again posing a new threat to the species. Though the last census of Rhinos at Kaziranga (March 1993) has shown a marginal increase since the previous census, yet things look rather precarious. This is specially so as the home land of the Rhino, Kaziranga, is also being threatened by some ecological problems, related to the floods.

An all out effort is called for, which requires resources, beyond the usual capacity of the Wildlife Wings. If the future of this species has to be ensured, an international effort is called for, and immediately. Saving the Rhino in India appears to be more difficult than anywhere else, mainly because of incredible human pressure exerted on the protected areas from the fringe areas.

I am grateful to the Ministry of Environment and Forests, Government of India, and specially to Mr. S.C.Dey, Additional Inspector General of Forests (Wildlife) to have called me to write a plan to be placed before the U.N.E.P. for providing financial assistance. The paper is based on the plan documents produced by the State Governments of Assam and West Bengal and all the datas provided are quoted from there. I am also indebted to Mr. Sahay and Mr. Vinod Rishi (both from the Ministry of Environment & Forest) who had provided me with all necessary help, whenever I requested for.

S. DEB ROY

19th April 1993
New Delhi

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1.1 BACKGROUND NOTE

The Rhinoceros unicornis or the great one horned Rhinoceros (also known as Indian Rhino) had once a large area of its distribution. Almost the entire flood plains of Indo-gangetic and Brahmaputra riverine tracts had been the happy hunting ground of this majestic prehistoric animal. Though evolved about 50 million years in the past, this species has undergone the least morophological change through the process of evolutionary changes. This aspect itself makes the animal quite unique and an object of intensive interest of science.

1.1.1 Though in the wild this species has hardly any natural predator or enemy, yet the species got dislodged and ultimately eliminated from most of its former range of distribution, mainly being physically exterminated by man. There seems to be two basic reasons for the same. Firstly the natural habitat of this species is most suitable for agriculture and naturally man, in his bid to extend his domain, started encroaching the homeland of the Rhino in the process of extending agriculture and pushed it out. Secondly the attraction of the magical powers of the Rhino horn for human use, as also its other parts being used for various purposes by man proved too much incentive and allurement for man, who eliminated this species from most of its former range through physical persecution.

1.1.2 In short, however, the result was that the Rhino got gradually eliminated from most of its original range of distribution and was confined to only some pockets of West Bengal and Assam in India and some Terai tracts of the Himalayan Kingdom of Nepal. By the turn of the present century the status of the species even in these areas went so precariously low that its future existence became extremely doubtful. But timely measures taken up to save the Rhino in these isolated pockets bore fruits. The status improved considerably and some former range areas were also colonised again.

1.1.3 Despite persisting pressure of poaching of the Rhinos and even though it is a slow breeder, its number clawed up and it appeared by the mid seventies that the Rhino may at last be out of danger. But from there the pressure of poaching mounted unprecendentedly, in many areas, specially in Assam, which still remains to be contained and the future of the Rhino once again appears to be not so certain.

1.1.4 There is just no dirth of Govt. and popular support for the conservation of this species in India and the results of this effort has been manifest in bringing back the species from the brink. All the same the Poaching of the Rhinos for thier horn has always dogged the efforts and continues to do the same, may be more than ever in the past. The challenge of saving the Rhinos not only in India, but wherever any of the Rhino species

survies till now, is probably much more intense at present than any time earlier. The future existence supply of all the species of Rhinos appears to be heavily dependent on the possibility of the elimination or at least drastic reduction of the use of the horn mostly for the false belief of various medicinal and magical powers attributed to the horn. Naturally this will not only depend on national effort by the range countries, but success can be achieved only through concerted international efforts and co ordinated action to curb or eliminate trade in Rhino horn of the products.

1.1.5 The Sky high price of the Indian Rhino horn, which is said to be nearly 40 to 50 percent higher than that of the African Species has been the centre of attraction for organised professional poachers' gangs, supported by wealthy and extremely cunning smugglers' rings having very strong international ramification. This has made containing of poaching an extremely hard task. The poachers are continually changing their mode of operation and technique to outwit the anti-poaching measures adopted. Detection of poachers with the booty is not common and easy. And even in the cases, where such detection had taken place prosecution through law and consequent conviction is even more difficult. Sophisticated weapons are being used for poaching and armed encounters between the anti-poaching staff and poachers has become quite common. Loss of life on either side is also not uncommon, which will betray the ominous dimension of the anti-poaching problem.

1.1.6 Govt. of India and the concerned State govts. are very serious about the conservation of the species. But they are facing resource problem to achieve this long term objectives. Wildlife management (within the deptt. of Forestry) is in the concurrent list in the Constitution of India, which makes both the Central and State Govts. responsible for preservation of wildlife. But often financial resource availability becomes a hurdle.

1.2 HISTORY OF RHINO PRESERVATION IN INDIA :

The distribution of the Great Indian one horned Rhinoceros had been almost all along the Indo-gangetic and Brahmaputra flood plains. But gradually with the spread of human settlement and consecutive agricultural practices, the Rhino was gradually pushed out from most of its former natural habitat, specially in the Indo gangetic plains, where human settlements had spread much earlier. Unfortunately the Indian Rhinos prefers swampy and water logged area as its natural habitat, which again provides ideal ground and climatic conditions for wet cultivation, the mainstay of peoples' sustenance and economic base. Naturally the Rhino became not only a competitor to the human population, but its habit of crop-raiding caused it great harm.

1.2.1 Besides, the Rhino horn had long been attributed various magical powers of curing difficult human ailments and as an aphrodisiac. Besides, it was and continues to be used as a charm to bring good luck and prevent various ailments and calamities. These superstitions as also the high price the horn always fetched became an incentive for killing of Rhinos. Over and above this, the hide of the Rhino had been commonly used as protective shields, various other parts of its body was also used in various medicines and charms. All these reasons brought in a steady decline of the population of the Rhinos in the Northern India and by the turn of the santuary only some small populations of the species survived locked up in some extremely inaccessible and disease prone areas, where man dreaded to tread and settle.

1.2.2 Spread of agriculture was followed in Assam and Bengal (West Bengal) by special cultivation i.e. Tea. This became a highly profitable economic proposition and naturally spread far and wide. Though the Tea estates were mostly located in slightly higher and well drained areas, thus fortunately avoiding the direct conversion of the generally swampy low lands, ideally suited for the Rhino, yet scores of labourers were brought from other areas as labourers and setled in the vicinity. Besides, with the gradual improvement in communication, the generally highly fertile land of Assam and North Bengal became a great attraction for agrarian people of eastern Bengal, now Bangladesh. A tremendous demographic change thus resulted which effected the Rhino seriously. The population in North Bengal and Assam has more than doubled since independence which may indicate the nature of demographic pressure in this area.

1.2.3 Setting up of the tea gardens involved clearance of natural forest cover or ecosystems. Naturally wild animals, both herbivores, who were scourage on agriculture as also the carnivores, who were a scourage for domestic animals, got ruthlessly persecuted, mainly by the tea planters and other settlers alike. This obviously drastically reduced the status of all wild animals in the area. But probably no other animal suffered more than the Rhino, which could somehow manage hang on precariously on the threshold of extinction, being wiped out from most of its natural range of distribution, even in those areas.

1.3 **ASIATIC TWO HORNED OR SUMATRAN RHINO :**

Didermocerus sumatrensis which was smaller in size and inhabited dense habitat in the lower hills and foothills of Assam and parts of Bengal, was less fortunate and got lost for ever, possibly during the late twenties or early thirties, due to the same reasons of humans persecution and ruthless destruction of this natural habitat.

1.3.1 The Javan Rhino or the Rhinoceros sondaicus Desmarest, had also been found in Assam and parts of Bengal earlier but went into extinction by the late nineteenth century (probably by 1880 or so). It is really incredible that all the three Asian Rhinos had been present in this tract, where the Indo-malayan and Chinese biogeographic realms tend to merge. This fact also suggests about the extraordinary biodiversity, the area still holds for the posterity, despite the ruthless onslaught of over use and abuse of the natural ecosystem, resulting from continuously spiralling human population and its consecutive demand for renewable natural resources.

1.3.2 However, during the first decade of the current century consciousness about the need of saving the Indian Rhino from possible extinction came about and for the first time the animal got some respite.

1.3.3 The first step in this direction was taken in Assam and a small area on the flood plains of the river Brahmaputra was declared as a Reserve Forest in 1908 and Rhino was granted full protection. This area was later extended repeatedly and is presently known as "Kaziranga National Park" in Assam.

1.3.4 In 1916 the area was declared as a Game Sanctuary, which was subsequently upgraded in status as a wildlife sanctuary in 1950 and lastly as a National Park in 1974.

1.3.5 Besides Kaziranga there are several other wildlife conservation areas in Assam and West Bengal where some Rhinos are resident. All these areas, except Manas National Park (also situated in Assam and is a Tiger Reserve) are quite small in area and hold fewer Rhinos, though concentration of the animal at least in two other areas, viz. Pobitara and Rajeev Gandhi Wildlife Sanctuary (Orang has been recently renamed) is very high.

1.4 **LEGAL ASPECTS :**

Prior to 1976 protection and management of wildlife and forestry had been a subject, dealt by the state Govts. As a result various legislations had been enacted by the State Govts. to offer legal protection to the Rhino. The first such legislation had been the Assam Rhinoceros prevention Act of 1915, which prohibited the hunting of Rhinos even in the unclassified forest areas. Subsequently in 1954 this act was made operative all over the state of Assam through promulgation of a more stringent Assam Rhinoceros Preservation Act. This Act, which offered full protection to a specific species of wild animal shows the genuine concern of saving the Rhino.

1.4.1 Apart from this special legislation, meant specially for the Rhino, there were other general legislations, also available to take recourse to protect the Rhino.

These were :

i. The Act for Preservation of Wild Birds and Animals 1887

ii. The Assam Forest Regulation of 1891, which offered protection to wild animals, birds and reptiles, as well as their habitat in the Reserve Forests and unclassified state forest areas. "Till recent times this regulation and the rules framed there under had been the most comprehensive legislative measures for the protection of the wild life in Assam".

iii. The Wild Bird and Animal Protection Act of 1912.

Subsequently the all pervasive Indian Wildlife (Protection) Act was adopted in 1974 in West Bengal and in 1976 in Assam. This Act is considered to be adequate to deal with the legal problems of protection of all the species of wild animals and this natural habitat, specially the endangered species, included in Schedule I of the said Act.

iv. Besides the above Assam has also adopted a National Park Bill in 1974.

1.4.2 The legal provisions from time to time had been felt to be adequate, eventhough the enforcement of the laws could not be fully satisfactory, mainly due to lack of man power and shortfall in financial resources. Poaching of Rhinos always remained a nagging headache for the managers.

1.5 **ADMINISTRATIVE ASPECTS:**

The control and management of the protected areas had always been entrusted with the Forest Department and till the beginning of the eighties the management had been handled by the forest officers, who had to depend mostly on this experience and field orientation during their wildlife tenures, as till the mid seventies hardly any formal training facilities were available in the field of wildlife management . Of course, some of the higher officials of the forest department availed themselves of the opportunities of getting training abroad in the field of wildlife management.

1.5.1 Research in the field of wildlife biology and management etc. did not get enough attention, except occassional and sporadic attempts made mostly by interested individuals.

Thus research input in management of wildlife had been very negligible, which resulted the managers to concentrate mainly on protection of wildlife which admittedly is of top priority.

1.6 STATUS OF THE RHINO :

Though management of wildlife, specially of the Rhinos, left some scientific aspects only lightly touched, yet the overall result of the management by the respective states, aided by the Central Govt. had been truely encouraging. The status of the Rhino had been improving, may be slowly, but surely, over the last eight decades. Admittedly this rise in the population had not been smooth and steady in all the Rhino-bearing areas, but the overall country status has been quite impressive.

1.6.1 Kaziranga is consiered in modern tiems as the natural home of the Indian Rhino, and probably rightly so. Hence a look into the history of Kaziranga as far as status of the Rhino is concerned is probably called for.

1.6.2 During 1907, at the time of setting up this Rhino Conservation area, the remnant Rhino population surviving there is estimated to be only about a dozen. Though the varacity of this number cannot really be vouchsafed, yet this had been taken as the base line data about the satus of the Rhino. From this precariously low number, the population has risen to nearly 1200 during the last 85 yeas. Considering the slow breeding of this species and its vulnerability to poaching, despite all attempts of anti-poaching measures, undertaken, this result is certainly encouraging. Similar slow but steady rise in population of the Rhinos in many other smaller areas of Assam and West Bengal has also been recorded and is shown in ANNEXURES.

1.6.3 The story of the preservation of the Rhino has not been of uniform success all the way. The poachers' and smugglers' well-knit underworld rings are always trying to catch the managers on the wrong foot. They are making the task of preservation as one of the most daunting in case of the Rhinos. They have been successful in few cases to make small dents in the population curve. But such challenges have to be taken up and overcome.

Table showing population of Great Indian one horned Rhino (1992).

Assam		**West Bengal**	
Kaziranga N.P.	1129	Jaldapara	33
Manas N.P.	80	Gorumara	13
Orang W.L.S.	100	Dudhwa	11
Pabitara W.L.S.	70		
Laokhowa Complex	20		
Other areas	60		
Total	1516		

NB. The recent census, March 93 shows the number of Rhinos at Kaziranga as 1264.

PRESENT MANAGEMENT ASPECTS

2. PRESENT MANAGEMENT :

The necessity of having specialised and properly trained manpower to handle wildlife management was strongly felt and as a consequence during the late seventies a special wildlife wing was organised within the Forest Department in the States to deal with wildlife management and related problems. The Chief Wildlife Wardens in the States became the statutory and administrative head of the wing, under whose control come the protected areas.

2.0.1 The Central Government in the newly formed independent Ministry of Environment and Forests set up a Wildlife Directorate, headed by the Director of Wildlife Preservation, who coordinated with the states and also overlooked the enforcement. He also looks after the states' demand for central assistance, management of zoos and various protected areas, besides coordinating with various international agencies and conventions etc. and heads the C.I.T.E.S. authority of the country.

2.1 TRAINING :

The need for proper training of the wildlife managers had always been strongly felt. The officers had been intesively trained in forestry upto the level of the Rangers (ANNEXURES may be seen) but the lower level field staff like the "Foresters" and the "Forest Guards" had only very limited scope of receiving any training.

2.1.1 However, since early seventies wildlife training has been taken up in India and at present Wildlife Institute of India at Dehradun is doing an excellent job of imparting wildlife training to the field managers of different levels, which has creditably filled up a long felt void. Several courses of wildlife training both of short and long duration is available for the managers and most of the field managers are now adequately trained in modern management techniques.

2.1.2 The Rhino Poachers are heavily armed now-a-days and are ruthless killers, who do not hesitate the least to open fire at the ati-poaching staff from modern automatic weapons, they use. This has made it obligatory for induction of automatic weapons for the anti-poaching staff also, mainly for self defence which remains yet to be done. A strong plea is being now made by the field staff for providing them with more sophisticated automatic weapons for combating the poachers.

2.1.3 Use of arms by field staff requires proper arms training for those, who handle the arms. Though there is no provision for any arms training for the Wildlife staff, yet local arrangements with the police has been made in some protected areas (Manas & Kaziranga) for training up the filed staff in using arms. But it is strongly felt necessary that more sophisticated arms and other equipments would have to be introduced and the staff trained more intensively sooner the better.

2.2 RESOURCES :

There has been a shortage of adequate resources both financial and equipment - wise in the management of wildlife in the states right from the beginning. Rhino areas have been somehow managed by the Forest Authorities within its own resources, without any extra input from the beginning of the conservation efforts. With gradual increase in concern about conservation of the species both from the state and central authorities a lot of central assistance also was gradually provided to the states for the conservation of Rhino. The help came in the shape of financial assistance, mostly.

2.2.1 Thus several schemes were introduced by the Government of India to provide the central assistance which can be seen in Annexures. The major boost, however, came in 1985 when a new scheme "Conservation of Rhino" was introduced to help conservation of the species in Assam. The upto date expenditure incurred with the achievements are provided in Annexure.

2.2.2 These schemes, specially the Rhino conservation scheme proved very useful. The wildlife management was considerably strengthened by creation of new posts, which augmented the understaffed authorities. New equipments and arms and ammunitions, were procured, as also the means of communication improved considerably. Besides, funds were available also for land acquisition required for extension of the National Park, which is essential for the parks' viability. Even the combined efforts from the Central and State Governments leaves a resource gap which is causing a lot of problems.

2.3 RHINO HORN TRADE :

The use of Rhino horn, specially in various medicines, has resulted in a flourishing trade in Rhino horns. But most of these medicines are in use in the far eastern countries, where there is a large population of Chinese origin. In India, some limited use of such medicines are recorded only from Gujarat. All the same a lucrative market existed for the Rhino horn in the far east markets and the same had been officially sold by the State Governments in public auction. But after the CITES ban on trading of Rhino horns in most of the international markets, no Rhino horn has been sold by the states. in Assam the last such public auction of Rhino horns had been carried out in the year 1974. But the sale was ultimately withheld. Since then a large quantity of Rhino horns have been accumulated in the Govt. store. The total market value of such present stock in the international market may amount to several Millions of U.S. Dollar !

2.3.1 Since imposition of the ban on trading in Rhino horns and ivory, Government of India had once taken a decision to publicly destroy all the stock, that had accumulated, consequent on the ban. But the State Govt. of Assam raised some objection against such destruction of some natural resources, which had a

considerable financial value. The State Government demanded the price (as prevalent in the current market) of the stock, if the same had to be deposited with the Central Government for ultimate destruction.

2.3.2 Government of India, as a solution, introduced the Rhino Conservation Scheme in 1985 with a five year allocation of Rs.50 Millions. Though the state govt. of Assam then agreed in principle to deposit its accumulated stock of Rhino horns. But the same has not yet been taken over by the Government of India.

2.3.3 In this connection it may be pointed out that the ban on trade in Rhino horns is several years old by now. But the effect of such ban is not at all encouraging. Clandestine market is reported to be booming and some of the user countries still remain outside the CITES or do not enforce the ban as rigidly, as is desirable. This is probably the main reason, alongwith the demand of the Rhino horn products, which made the trade to run uninterrupted. With the unabated demand of the products, the price is continuously soaring, providing added incentives to the smugglers' racket. This has made the Rhino poaching to attract poachers who don't hesitate to take big risks, even of their life.

2.3.4 The only solution probably lies in abandoning the use of the products of the Rhino horns as medicines (aphrodisiac and antipyratic) and also as charm (as prevalent in India). But this appears to be a hard task. Some efforts have been made to publicise the myth about the so called properties of magical cure of the horn, which is nothing but an epidermal mass of matted hair, but such efforts have failed to impress the users, who have stuck to their traditional and customary belief.

2.3.5 While further attempts to at least curb the use of Rhino horn products may continue, we seem to have no choice but to fight the poachers' guiles in the wild, if we have to save the Indian Rhino. Admittedly this is one of the hardest tasks at hand. The poachers, supported by the smugglers' ring, and sometimes even by some so-called respectable and socially highly placed persons, keep on dodging the anti-poaching staff. These poachers are heavily armed and equipped and keep on changing their technique. "Surprise" is their major weapon, which often catches the anti-poaching staff unaware and off guard.

2.3.6 These poachers are all outlaws and dangerous, who does not hesitate a bit to open fire on the antipoching staff, when confronted. This has resulted in many loss of lives from either side, specially during the recent past. With the sky-rocketing of the price of Rhino horn, the stakes have become very high and poachers are not hesitant to take any risk, even of their own lives, even though the amount received by the actual poachers is reported to be quite insignificant, the larger part going into the pocket of the smugglers. There are always several links in the chain, starting from the poachers upto the main trader or the smuggler, who may have international links.

2.3.7 It is because of this multiple link chain of smuggling that the kingpins or the master-brains behind such illegal trade of Rhino horns are very seldom exposed or brought to book, even when the poachers or some of the linkmen are apprehended. The links are generally frequently changed and may not know even their next contact. Besides, its anything but easy to get a culprit convicted, even when apprehended, even though the Wildlie Act is extremely stringent. This appears to be mainly because of long drawn out legal wranglings in the courts of law, lack of proper supervision of the legal procedures by the Government and contrasting superior handling of law cases by the accused, who invariably engage the best of the lawyers. And even if a poacher or a linkman in the chain get convicted, the kingpins start the game all over again, drawing in new hands.

2.3.8 But generally the gang members and their families interest is well taken care of by the syndicate and when anyone is apprehended, all possible legal assistance is immediately arranged. Their families keep getting all required help in their absence. Sometimes bail is aranged even before the apprehended culprits are produced before the magistrate !

2.3.9 To fight legal battles with such professional gangs is not easy. Proper preparation of the cases and presentation is highly important and is now being given more attention.

2.4 ENFORCEMENT:

Much more attention and effort is called for efficient enforcement. Once the poacher successfully slips out of the protected areas with his booty, it becomes almost impossible for the anti-poaching staff to track and nab him, let alone convict anyone. Beefing up and extending the enforcement network is therefore a must, which is under consideration of the Government of India. Government of Assam has also started an enforcement wing, which should be extended and strengthened sufficiently.

2.5 SECRET FUNDS :

Receiving prior information about the activities and movement of poachers and smugglers is extremely important to nab the criminal, who indulge in such nefarious activities. Generally such informations are received occassionally from the common people, who generally abhore poaching and smuggling. But often underworld activities remain away from public eye and even if some information is received by any one, such informations may not be easily passed onto the authorities for fear of serious reprisal from the gangs.

2.5.1 It is therefore felt essential that a clandestine line of informations gathering system should be maintained to help the anti-poaching and anti-smuggling staff. "Traffic India" is

providing very good support to anti-poaching and anti-smuggling drive. But a process of "buying information"by providing some "secret fund" to the anti-poaching organisation needs to be implemented. This should provide a big boost to anti-poaching device. Using recent funds for "purchasing " informations about poachers activities had been extremely useful in Chitwan N.P. in Nepal to curb poaching of Rhino and other animals and should provide good results elsewhere also.

2.6 MANAGEMENT RELATED PROBLEMS :

All the protected areas having Rhinos are generally situated on the flood plains of some rivers in the Northern India. Such areas are invariably flat alluvial plains and has extravagantly rich monsoon climate, conducive to a high level of biomass production. Such areas enjoy typical monsoon climate and the land is one of the most productive, anywhere in the world.

2.6.1 Obviously these areas are capable of producing a very high yield of agricultural products, specially rice or paddy, if rice cultivation is resorted to. And agriculture is the main occupation of the local people. Agriculture is also the base of economy in these areas. Naturally with rise in human population during specially the current century, extensive areas under natural cover had been brought under the plough, which drove out the Rhino from its home. With the Rhino many of its associate species like the wild buffalo, the swamp deer, the hog deer and even the tiger were banished from their natural home. Only some extremely inaccessible and typical disease infested areas had been left, which were extremely hazardous for man to occupy.

2.6.2 With the advent of agriculture, special agriculture in the form of mainly Tea Estates also made serious inroads into the slightly higher flat land in the Assam - Bengal plains, where the ramnant Rhino population somehow managed to hang on to a harrassed existence. Some such areas were gradually converted to protected areas, mainly with the basic objective of protecting the small populations of the Indian Rhinos.

2.6.3 Meanwhile pressure on such land, which are all excellent potential agricultural land, kept on rising and it was anything but easy to contain such thrust, resulting from human demand from time to time. All due credit must therefore be given to the respective State Governments for their locking up such areas against human use, specially for the presrvation of the wildlife and Rhinos in particular. It is only recently, that the importance of preservation of all natural renewable resources or the bio-diversity has been realised though such objectives have been taken into account already, even though Rhino had been taken as the symbol. Any way, biotic influene in many of these protected areas still remains as a source of irritant in management, of course in the Manas and Kaziranga National Parks

such biotic influences have by and large been eliminated, and in some other areas it is being sought to be done.

2.6.4 This is easier said than actually done, specially implemented in the field. All these protected areas are in effect small islands of natural eco-systems, sought to be protected against biotic interference, situated within very thickly populated human settlements. These areas had long been used by man for sustenance by way of harvesting renewable natural resources from there and it is only too natural that elimination of biotic influences from such areas would create human problems.

2.6.5 Apart from such areas being used for forestry resources like timber, roofing and other house building materials, fish and various aquatic plants, the extensive grasslands in the Rhino habitat had been used traditionally for grazing cattle, mainly buffaloes down the ages. Even to the present days there are many professional graziers, who are occupying large river islands with their animal stock. Many of these river islands have gradually been occupied by agriculturists, which has caused not only the wild animals to the pushed out, but this has resulted to denial of grazing areas also to these professional graziers and their stock of cattle. This appears to be the main reason for the professional graziers sharing the extensive grasslands on the river banks and islands with several species of wild animals, including Rhinos in the past.

2.6.6 When such areas were made into protected areas, domestic stock grazing was allowed to continue, alongwith some other rights of use. This caused various problems in management and protection, besides the competition for grazing between the domestic stock and the wild herbivores and also the probability of infectious or communicable disease, effecting the wild animals. With rise in the Rhino population in these areas, crop raiding in the nearby agricultural fields gradually became another sore problem, which added fuel to the already burning issue of poaching of Rhinos for its mythical horn or the unicorn.

2.6.7 However, human use or biotic interference from these protected areas were gradually banned since late sixties in Assam and also in West Bengal. The inconvenience thus caused to the fringe people caused alienation of these people from the wildlife managers. Information about poaching or smuggling of Rhino horns (or any other part) was passed on to the wildlife people only very seldom. This made the protection job much more difficult. Illegal felling of trees, collection of thatch and reeds, illegal grazing and fishing within the protected areas occassionally took place, but was under reasonably strict control.

2.7 MANAGEMENT ASPECTS :

Almost all these areas had been initially constituted as Reserved Forest, to start with and had been managed under the Forest Deptt. mostly as Forest Beats, under a Forest range. Only a few forest guards under a "Forester" used to man such areas, as was the case in Forestry management elsewhere. Gradually most of these areas have come under very intensive management and are being controlled by a Deputy Conservator of Forest level officer. Naturally, the number of personal has also been incerased over the years as per necessity of mainly protection, depending on the changing ground realities. At present some of these areas are the most intensively managed protected areas in the country. But even then poaching of the Rhino has remained as the center of problem till this day. In fact recent happenings, specially in Assam, probably influened by the political instability, is now posing a new threat to the species. In the Kaziranga National Park, which is often called as the home of the Indian Rhino, between 40 to 45 Rhinos are being poached annually during the last three years. Death of the Rhinos due to natural causes and poaching is probably now completely neutralizing, or may be even outpacing the natural growth of the species. This is far too serious a threat to be ignored and a fresh initiative is immediately called for. Government in the state has been taking due care and attention in the matter and assistance from the Central Government is also flowing in, but all such efforts seem to be inadequate to handle the situation and the Rhino seems to be in a fresh danger again.

2.8 PEOPLE'S ATTITUDE :

It is very reassuring that the general sentiment of the people is strongly conservation oriented. Compassion towards any life form is an old Indian tradition, none, particularly in the villages around these protected areas like to kill or harm the wild animals. Co-existence with the wild animals, who are mostly at their backyards had been a way of life. Besides, many animals are regarded as vehicles of various Gods in Hindu religion. Rhino is also regarded as the vehicle of the great "God Vishnu". One legend goes, that the uncertain tempered Rhino had run away with the saddle still on, and the saddle got modified into the thick armoured folds that the Rhino carries till to-day ! Some people in Assam still believe that if a Rhino sets foot on his land, it brings good luck to him ! But with increase of their number nearly hundred times at Kaziranga the situation has drastically changed. It has become a source of torment for the nearby agriculturists because of the very existensive crop damage that it causes now.

2.8.1 With this background of the conflict between the interest of the Rhino and man, it has become extremely difficult to obtain common man's support for the cause of conservation of the Rhino. For the success of conservation, this is obligatory. As a result "Eco-development" plan is contemplatd in the fringe

areas to win back the waning public support. The plan envisages to mitigate peoples sufferings and their poverty on one hand and also attempt to reduce their dependence on the protected areas on the others. Besides, health care, veterinery care, education (specially on conservation) etc. will also be taken up with support to indigenous cottage industry, arts work etc. to upgrade the all important " Quality of Life".

2.8.2 The Eco-development plan will be controlled by the Park authorities, if necessary with required support from other Government Departments. The villagers thus may realise that the Wildlife Managers is not their enemy, but is merely doing his assigned duty of protecting the precious natural heritage, that too in the future interest of the human community. In such an event popular support for the Rhino should be obtained.

2.9 **MANAGEMENT TECHNIQUES :**

As mentioned earlier, the management of the Rhino bearing areas are mostly protection oriented. Protection of the animals and their habitat has all along been given the top most priority. These areas contain extensive, grass lands and also some mixed forest types. As Rhinos are essentially grass land animals, it is extremely important that percentage of grassland and the woodland is maintained. But the geo-climatic situation of these areas is such that, if left to nature, these areas would be converted into woodland by way of succession in the long run. That situation will not favour the Rhino and therefore should be avoided.

2.9.1 In the Rhino habitat the tall grass dry up during February - March. Most of the fodder species become dry and coarse, naturally unpalatable. As a result the dry grass was deliberately burnt by the graziers, who wanted new grass to sprout and replace the old unpalatable stuff for their cattle. The result of such induced burning in these areas is quite spectacular, as within two weeks after burning new shoots invariably sprouts and the area turns green within the next two weeks to offer excellent grazing to all herbivores. Fire results in invigorating the bulbs and the subsequent flush of grass becomes more vigorous than the grass that would come naturally, without burning.

2.9.2 Further, the burning retards the colonisation of the grassland by tree species, which naturally helps in maintaining the existing grassland, something like an arrested sub-climax. However, the wet grassland, where a number of reeds are also found, cannot be burnt, as such areas, are marshy and waterlogged areas with a lot of surface water available right round the year. Such areas are extensively used by the Rhinos and other herbivores, when the higher and dried grass is burnt.

2.9.3 The same practice of burning the open grassland in the Rhino habitat is continuing with tangible and good results. However, research should be conducted the fix up the burning regime in all such areas and the best regime adopted, instead of blindly following the old practice. Burning under strict control, which may produce the best results seems to be imperative mainly for maintaining the extent of the grassland, specially for the sake of the Rhinos, which shall also help conserving some other species. Often misunderstood lop-sided and unfounded criticism are raised against burning. It is always said that many animals, specially rhodents, reptiles and insects are destroyed by the burning, as also this creates at least a temporary food crisis. But it may be said that most animals leave the dry and coarse grass land patches as even if such areas are left unburnt, fodder is scarce there, any way. There are very few instances on record to suggest that animals are lost to induced fires, which may call for abandoning the age old practice. Fire has indeed been used in these areas as a management tool with good results and no harm caused, and should well continue under strict care and control.

2.10 **ANNUAL FLOODS AND ECOLOGY :**

The Indian Rhino appears to prefer the grassland habitat along the rivers where a moderate climatic condition prevails. In such areas the highest temperature is not higher than 37 - 38 C and never less than 7 C to 8 C. The air is never very dry, the humidity never below 50% and often above 90 percent.

2.10.1 The climate is strongly influenced by monsoon and floods are annual and regular feature. So much so that the annual floods contribute a good deal to the ecology. In this connection the situation at Kaziranga in particular and also the other protected areas along the river Brahmaputra may not be out of place for some discussions. This National Park is situated on the river Brahmaputra and had been, most likely, once in the river bed itself, as is clearly evident from the nature of the land formations and the water bodies contained therein. Some of the lakes here have land - locked populations of gangetic dolphins, which may be clear proof of this fact, besides many other evidences in support.

2.10.2 However, the river Brahmaputra is well known for bank erosion as also huge accretions that it causes by depositing silt during the annual floods. These accretions gradually get established in the form of small and large islands and are colonised by grass and subsequently progress into woodland, thus forming ideal Rhino habitat. But the land in the National Park is also eroded by floods and has been already reduced considerably, specially during the last three decades.

2.10.3 Another fact is also of high importance. Upto 70 to 80 percent of the National Park is inundated during the floods, when silt is deposited and the land level is raised. This is of considerable ecological significance as the change is ground level and therefore the changing water table gradually modifies the vegetative succession. The floods are therefore contributing to the ecology of Kaziranga in a big way. The erosion on one hand and the simultaneous accretion on the other help in availability of ecologically suitable habitat for the Rhino in special, and its conspecifics in general.

2.10.4 Due to various reasons mainly deforestation in the upper catchment areas of Brahmputra, the intensity of floods is continuously on the rise, specially since the last two decades. The highest flood level is crossing the previous level almost regularly, which is causing inundation of even the higher areas, which had no record of inundation earlier. The ever increasing flood level is now threatening the Park and the animals. Most of the animals including the Rhinos have to migrate from the Park and take shelter on the adjoining high grounds at the base of the Karbi Anglong hills or wherever they may find shelter. These areas are also thickly populated and protection of animals during the period (migration from and back to the Park again) becomes an uphill task. Many animals, particularly the young, old and infirm lose their lives even during the actual migration.

2.10.5 Earlier on the deer population (specially the Hog deer, Axis porcinus) used to be mostly effected. But with continuous rise in flood level, even the Rhino is badly effected. During 1988 a large number of Rhinos (46) had perished during the floods and out of these 34 were sub adults. Some starvation deaths of mother and their succkling calves also were reported for the first time, which was caused because such mothers with their babies took shelter on some high grounds and no grazing was possible as the surrounding areas were under deep water for more than two weeks' duration. Above 2200 deer carcasses were counted by the Park staff but the estimated actual loss of deer is estimated to be as high as 8000 to 10000 during that devastating year. Some elephant and bufallo calves were also lost, which was recorded for the first time ever. The Park staff, however, managed to rescue some couple of hundred deer and other small animals by patrolling the flooded areas using mechanised boats.

2.10.6 Floods are always considered to be a dreaded period at Kaziranga for the animal life but since the last decade the effects of the increasing level of multiwave floods is really threatening the future of the Park and naturally the Rhino. At the same time floods seem to be one natural factor which helps in rejuvinating the natural productivity of the land which is one of the highest biomass production areas, not only in India,but anywhere in the world. Floods, therefore, should be considered as an integral part of the ecology of the area which supports the high biomass.

2.10.7 At the same time the unnatural increase in the flood level and the consequences have to be dealt with. Some artificial highlands have been constructed in the Park for sheltering the Rhino and others animals inside the Park and this measure has proved to be quite successful, but is really grossly inadequate compared to the necessity.

2.11 MEASURES TO COMBAT FLOOD DAMAGE :

There are several large river islands adjacent to the Park, which are eminently suitable as natural habitat for the Rhino and other species of animals. Such islands are all colonised by the wild animals in the course of time, who migrate from the Park. But such areas are now mostly occupied by the professional graziess. These areas have been proposed to be acquired and added to the Park. In fact, the boundary of the Park which now goes along the south bank of the river, Brahmaputra, has been proposed to be changed and the river course included within the Park, which shall ensure to maintain the total land area of the Park despite bank erosion, as new islands formed due to accretion will automaticaly be included within the Park which shall ensure to maintain the total area of the Park despite bank erosion as new island - formed due to accretion will be automatically included within the Park. Further, the river is often used by some poachers for entry and get away by the river. If and when the control of the river is bestowed with the Park authorities poaching in the northern areas of the Park should be better controlled. The proposal is under process now.

2.11.1 An existing seasonal road, which runs along almost the entire length of the Park has been proposed to be widened (12 metres) and raised above the flood level, so that besides facilitating, communication the same will also enable to shelter wild animals temporarily, during the high floods. In doing so, proper care shall have to be taken to allow passage to flood waters, even though most part of this road has been aligned along the course of the flood waters. There will be a few other critical short roads, raised accordingly. Besides, some more artificially raised platforms shall also be constructed, mainly along the low southern areas of the Park, where the flood effects are more pronounced. This should largely solve the flood problem for the distressed wild animals of the Park.

2.11.2 The area of the National Park is around 430 Sq Km., which is not really small and is capable of holding a viable population of Rhino. But this area is really not ecologically viable, as the Rhino has to seek temporary shelter on the high lands, outside the Park area. But such highlands are mostly populated areas and wild animals including the Rhino, are not at all safe there. The highlands in the south of the Park, situated at the foot hills of Karbi Anglong hills are ideally suited for sheltering the distressed animals during the floods. But besides the numerous villages on the fringe of the Park, there area a number of tea estates on the foot hills. New habitations

are mushrooming outside the tea estates, down south, which is a constant source of harassment and threat to Rhinos and other animals.

2.11.3 As a result some of these areas have been sought to be acquired and added to the Park, which will surely improve future viability of the Park. But it is easier said than done. Acquisition of the tea estates and relocating those elsewhere will involve payment of large sums, as these tea estates are highly economic properties and are earning good foreign exchange for the country. Notwithstanding this matter has to be pressed relentlessly.

2.12 REALIGNMENT OF NATIONAL HIGHWAY

A National Highway runs very close along the Southern boundary of the Park. This highway is extremely busy and even touches the Park at some points. This road is a constant irritant to the Park management, as many incidents are known when poachers had travelled in trucks on this road and got away after poaching. There are a number of roadside restaurants along the road, where poachers often come for local information and sometimes even are provided help. Besides, the traffic on the high way is a hazard for the migrating animals during the monsoon. Many accidental death of animals including several Rhinos have occured during the past.

2.12.1 This road has been poroposed to be shifted away from its present alignment and is being in the final stage of acceptance by the Government

2.12.2 It must however, be remembered that all these proposed steps discussed above is extremely difficult to achieve. The surrounding areas of the Park are all very productive and suitable for agriculture, which makes acquisiation of such land very difficult and an expensive proposition. Besides, the villages around are very thickly populated and there is incredible pressure for aggricultural land and for grazing of domestic animals. Despite this several extensions of the Park have been effected durig the past, which certainly speaks very high about the intentions and commitment for conservation.

2.13 OTHER AREAS IN ASSAM :

There are several other areas in Assam, where Rhino population is doing quite well and this is shown in separate Annexures. Out of these areas wildlife sanctuaries of Pabitora and Orang (recently renamed as Rajiv Gandhi Wildlife Sanctuary) have very high concentration of Rhinos. Both these area are of very recent origin, as far as protected area is concerned. The later had been a plantation area since early sixties. Both these areas contained a small population of Rhinos and therefore offered protection. Later these areas were legally constituted as wildlife sanctuaries.

2.14. NEW PROBLEMS OF POACHING :

During 1983 there had been a serious political turmoil in Assam and large scale disturbance and sporadic violence broke out. This caused serious set back in some conservation areas and the entire Rhino population of Laokhowa W.L. Sanctuary was wiped out by armed miscreants, while many guard posts had been either burnt or destroyed. There were about 40 Rhinos at Laokhowa of that time. But it is a pleasant surprise that 5 to 6 Rhinos have again colonised this area, seemingly taking refuge during floods, most likely migrating from Orang or Kaziranga. These animals are under strict protection now.

2.13.1 Similarly, the Manas National Park also got effected by armed insurgency since 1989. Many of the guard posts have been attacked by armed militants and either burnt or destroyed after pitched gun battles. Some six anti-poaching Park staff were gunned down and unspecified number of militants also shot dead in these gun battles. The near hundred Rhino population at Manas has been hit seriously as the miscreants killed several Rhinos here.

2.13.2 Kaziranga itself has seen a spurt of Rhino poaching since last few years, as mentioned earlier. It is strongly felt that the political uncertainty in the entire region during the past few years has been the chief reason of this spurt in poaching. Some of the armed insurgent groups of the North East India are reported to be bartering Rhino horns for procuring sophisticated Chinese arms, ammunitions and explosives in the lawless northern Myanmar area, which has opened a new front of battle of attrition. There is certainly no easy solution to this problem. Strong political will backing up a dedicated and determined management may again win the battle provided necessary resources are made available.

2.15 NO DEVELOPMENT ZONE

It is worthwhile to mention here that there is a Central Government directive and guideline that no development (Industrial) work or plan will be taken up within 25 Km of any National Park or Wildlife Sanctuary. This is a very important policy matter, as often development projects influence the protected areas indirectly.

Problems facing Rhino areas in West Bengal -

Jaldapara and Gorumara Wildlife sanctuaries in West Bengal are something like small islands of conservation areas in a sea of high denisity human settlement. Naturally in such a situation the spiralling human demand on the forest areas for natural renewable resources is the main decimating factor, acting against conservation needs. Such pressure, which is constantly on the rise, manifests itself in many direct and indirect ways, including even abatment of poaching by resentful villagers, who might have been deprived of their conventional right of use of

the conservation areas.

It may be realised that the Rhino population at Jaldapara has been fluctuating from a maximum of around 80 in 1968-69 to as low as only 14 in 1985. The number of Rhinos has now clawed back to 33 (1992) and poaching, which is the only factor behind such abnormal population fluctuation seems to have abated since mid eighties. But it is extremely uncertain whether this trend can be sustained. Poaching may again raise its ugly head and since the population is really slender, the future of the Rhino in West Bengal seems to be still hanging in a delicate balance.

Indications are quite apparent that the anti-poaching strategy adopted has been quite successful during the recent past and should be persued vigorously without complacency starting Eco-development plan for the people around the protected areas should be able to enlist popular support, which will automatically strengthen anti-poaching drive. Eco-development should go a long way to contain human pressure on the protected areas.

Ecological problems- Jaldapara Wildlife sanctuary consisted of only 115.53 Km^2 till very recently. This area has been extended by 100.78 km^2 only recently. The wildlife sanctuary is a linear belt along the river Torsa, which flows North to South, emerging from the steep Bhutan Himalayas in the North. The protected area holds a combination of the "Bhabar and Terai" area, and a large part of this is eminently suitable Rhino habitat. But the river Torsa is known for frequently changing its course and also for heavy floods. Such heavy floods and changing of the course may easily become a resource of serious problem in future. The area of this protected areas should ideally have been much larger for secured future and viability of the Rhino. The Government has done a creditable job to extend the area, which is anything but easy in this area. ~~But some villages have to be shifted now, without which the objectives of such extension may remain unfulfilled.~~

The area of Jaldapara is probably the only area in the Terai belt of the Eastern Himalayan foot hills, besides Manas, where Rhinos have been occupying natural habitat against heavy odds. With proper protection ensured along with people's active support, the area certainly holds the potential of supporting a viable population of Rhinos. It may even be possible to seriously consider re-introduction of the Swamp deer and the Buffalo, which had been exterminated from this area within the last 100 years or so.

ACTION PLAN

3. ACTION PLAN

From the foregoing description it may be quite evident that the conservation of the Indian Rhino has recently run into serious troubles. Though the consumption points of the Rhino horn may have remained the same, yet the source of collection seems to have found a new channel, if the reports of bartering of Rhino horns by various insurgent groups against arms are true. It is true that frequent bank robbery, which had been resorted to by various insurgent groups of the North East has stopped with the spurt in Rhino poaching. This may give evidence, though admittedly very indirect, to the recent reports, which are near impossible to varify All the same, if true, this certainly poses a new direct threat to the species.

3.0.1 The Indian Rhino horn is also reported to be much costlier in clendestine market compared to the African varities. And compared to African conditions, where visibility is very good, the habitat conditions of the Indian Rhino provides the poaches a much better chance to kill Rhinos and get away with the booty. Anti-poaching is thus a much more difficult task in India than in Africa specially because of the thickly populated villages in the vicinity, where the poachers and smugglers can easily melt away. But despite the more serious problems, Rhino conservation had shown remarkable achievements in this country during the past.

3.0.2 Though a new challenge has surfaced yet it can confidently be assumed that this challenge can also be taken up successfully if proper resources are made availablke. There should be no dirth of commitment, dedicated persons and resolve to carry on the battle. The law is also sufficiently strong to favour protection.

3.0.3 The preservation of the Rhino has been given one of the top most priorties in this country since the very first decade of the current country, which once brought back this species from near extinction. While, it was being thought that the species is now safe, yet another new threat has appeared. And this time the threat seems to be much more serious and also sophsticated.

3.0.4 Naturally, the protection machinery has to be adequately geared up afresh to fight the onslaught of physical extermination of the species. This has to be done immediately as the poaching is neutralising the growth and there is not much safety margin. Nearly a century of hard toil, a lot of sweat and blood spilled during this period, cannot be allowed to go waste.

3.0.5 The Government (both Central and States) is doing all it can, but the efforts are restricted within the available resources, which is having a gap between the desirable plan and the reality. This is making things difficult.

3.0.6 The other aspect is the problems related to ecology. Some of these may be dealt by adoption of appropriate management techniques, backed up by scientific research, which is nearly totally lacking, unfortunately. With the increase in population of the Rhinos, management in future will have to guard against many new problems and research will be obligatory to resolve ecology related problems in particular..

3.0.7 A lot of input is required also in the management, which shall have to be intensified further to take care of the prospective habitats nearby, where the Rhino is already colonising or likely to colonise in short future.

3.0.8 There should be some provision for appropriate compensation to be paid to the farmers, who suffer loss of crop due to Rhino depredation. These farmers are all poor, many below the poverty level and naturally nourish strong resentment against the management for their loss. Unless their interests are looked into by the Government, their cooperation and help will remain a far cry. But on the other hand containing poaching will be extremely difficult without proper support received from the local villagers.

3.0.9 Besides, the National Park area is debarred from any human use by law. This prohibition in the case of the National Parks and wildlife sanctuaries is rigidly enforced in Assam and West Bengal. The people resident on the fringe areas had long been using various minor forest produces from these areas for their house-hold consumption. For example they used to collect small timber, reeds and thatching grass for house construction and repairing. They also used to collect various other usufructs life fruits, leaves, barks and roots of various plants for medicinal and other use. They used to graze their cattle in these areas and even hunt for their protein requirements. Upto a point of the time such use had remained within sustainable limits, but gradually demographic changes brought about very high pressures on the diminishing natural renewable resources.

3.0.10 However justified the prohibition may be, this undoubtedly became a source of irritant and resentment for the village people. The wildlife officials who enforced the ban and apprehended offenders, could not provide any help to the villagers in any way. To add to this, crop-raiding by increasing wild animal population increased many folds. The wildlife staff thus became an enemy of the people and the apparent discontent gradually took shape of open confrontation. In some cases poachers are reported to be sheltered and guided by the local villagers! No doubt that poachers had a field day.

3.0.11 To add to the complication some vested interest groups and short sighted political adventurists to took advantage of this situation and fanned and incited the poor villagers discontent, which led to open confrontation in some areas.

3.0.12 In view of the above an eco-development plan for some of these protected areas are envisaged. In this plan it will be aimed to ameliorate the poor living conditions of the people and reduce their dependence on the forest. In doing so maximum emphasis will be given to the quality of life and improvement of their living conditions will be aimed at within their traditional life style. Utmost care will be taken to avoid consumerism and market economy, as this invariably increases the use of natural resources.

3.0.13 Government of India has already introduced a scheme "Eco-development" and the aim is to cover as many protected areas, as may be possible. But it may be easily realised that financial constraints will be a big hurdle to surpass, as there are more than 500 protected areas in this country.

3.1 PEOPLE'S AWARENESS :

In conservation efforts of any species, people's support is unavoidable and this may be forthcoming if the people are aware about the necessity of conservation of the wild flora and fauna, which ultimately serves the long term interest of man. Indian people has long record of traditional and cultural awareness about conservation. It is therefore, necessary to take steps to revive and renew the conservation approach, keeping in close touch with the villagers, studying and understanding, their culture and tradition and arousing their sentiments for conservation. This type of works is already going on, but requires to be intensified further.

3.1.1 The best strategy to combat poaching is to obtain prior information about their intention and movement and nab them before they strike. Such informations are often available with the villagers. But seldom they divulge such informations mainly for fear of repraisal by the outlaws. Sometimes they may even be paid for keeping quiet. All the same some informations are leaked out by the villagers, which leads to detection of poaching and even apprehending the poachers and smugglers.

3.1.2 It is a good idea to arrange for a small "secret fund" for "buying" informations about poachers and smugglers' movements and their activities. This should greatly help the anti-poaching drive. This amount may be utilised by the Field Directors and kept as a total secret. Because any leakage of information about the source may endanger the life of the informer. There is some provision of meagre amounts to be paid to informers, when some detection leads to conviction. But this does not seem to provide enough incentive.

3.2 PROMOTING N G O PARTICIPATION :

Enlisting public support is easier said than done. Often the N.G.O.s clash with the widllife management, instead of providing necessary support. All care will have to be taken to avoid such undesirable situations. To achieve the objectives of the Eco-development planning, N G O support is essential and is felt unavoidable. In this planning of various social activities will be involved and here NGOs can be great help and use.

3.2.1 The work of eco-development will involve various activities with which the wildlife managers (staff in general) are not really accustomed when the field of sociology in particular will be extremely important. Then there will be various activities in which not only people's support, but their active participation will have to be obtained. The present mood of the general people may not be exactly conducive for such essential activities. The N G Os can act as catalytic agents help achieving such objectives.

3.2.2 Besides, the eco-development plan does not envisage to immediately increase the manpower, which means that the work load of the wildlife staff will go up. The field staff in most areas are usually overworked and hence they may be in difficulty to carry on the added burden efficiencly. N G Os help therefore will be invaluable.

3.2.3 Some N G Os in Assam and West Bengal are already doing very good works. Some of these organisations have, in the past, even taken up legal cases against wrong decisions in the protected areas and eventually got those revised. Government will have to channelise such efforts in the right direction.

3.3 TRAINING OF PERSONNEL :

The matter of engaging dedicated and willing persons for wildlife management is imperative as such works are often unorthdox and requires decisions to be taken in the field. But such people should also be properly trained and equipped to carry on with their work creditably.

3.3.1 The higher level of officers, Forest Rangers and above, can undergo such a Wildlife Training at Dehradun in the Wildlife Institute of India. Several long and short term wildlife training courses are run in Wildlife Institute of India (WII). But there is very little scope for any training of the lower field staff. W.I.I. at Dehradun is now trying to provide some facilities for training to the field staff also.

3.3.2 However, the matter of imparting training to all level of management staff is essential. Further the field staff have to handle fire arms and have to often use these in self defence in combating, poachers. The poachers are now using highly sophisticated weaponry in poaching and as a result the field staff should also be provided modern weapons to match poachers' fire-power. This will necessitate the field staff to be trained in using such arms and in jungle craft. Though some short training in rifle firing is imparted to the field staff yet this is grossly inadequate.

3.4 FACILITY FOR THE WILDLIFE STAFF:

Though the work of the wildlife staff is much more arduous and also involves heavy risk, yet they are hardly granted any due reciprocate consideration. It is considered necessary that such field staff should be considered at per with the defence or paramilitary personnel, which will attract the best persons. When engaged in field duty, such personnel should be provided with free ration besides being granted some special allowances. They should also be given one months earned leave (compulsory) every year and travel concessions to visit their families. Some recommendations in this regard are under due consideration of the Central Government. Such staff should also be entitled to free uniforms both for winter and monsoon. Life insurance cover should be provided by the Govt and provision of suitable compensation for loss of life and permanent disability caused during the duty must be ensured. Proper medical attention to such people is totally lacking and should be provided. Providing, family accommodation to the field staff at the Range Headquarters should be considered, because in most field postings there is no scope for family accommodation.

3.4.1 Further to the above good and courageous works by the field staff should be appreciated and rewarded by awarding "decorations" leading to accelerated promotions. All these steps should ensure greater efficiency.

3.5 CAPTIVE BREEDING :

The record of captive breeding of the Indian Rhino in various zoos appears to be quite encouraging. Indian Rhinos are breeding will not only in this country, but also in many other countries of the world. Stud books are now being maintained in Indian Zoos, wherever this species breeds which will help in avoiding genetic drift and consequent depression. A detailed study to identify the fodder species and the required nutrition gradiant to be maintained for the Rhinos seems to be extremely important if success in captive breeding has to be assured. Some sporadic studies about the fodder species had earlier been done by some individuals, but the nutrition gradiant probably remains unexplored.

3.6 TRANSLOCATION AND REINTRODUCTION :

In the matter of long term planning for conservation of any species of wild animal, the future possibility of translocation and reintroduction of some of the animals in suitable habitat should remain in consideration and future planning. This possibility will, of course, depend on the success of the conservation efforts and the consequent rise in the status of the target species.

3.6.1 During the early eighties (1984) some Rhinos from Assan had been translocated to Dudhwa National Park of Uttar Pradesh. This National Park is situated at the sub-himalayan Terai region of northern Uttar Pradesh (U.P.) and contains tall grass lands and some water bodies in a predominently Sal forest. This area had Rhinos earlier, but the species disappeared from here just about 200 years back. In some adjoining areas in Nepal there are some Rhinos and doing quite well. For this purpose a comparative study of the flora of Kaziranga and Dudhwa had been made. A comparison in the climatic conditions was also carried out.

3.6.2 However, initially Rhinos were tranquilished and brought to Dudhwa from Pabitora of Assam. These Rhinos had been kept in some enclosures for about few weeks before these were finally released in a much larger enclosure. This large enclosure was provided with electric fencing, so that the Rhinos did not stray out of the Park and secondly not to allow any tiger to move in, which could be a hazard for the new born Rhino calves. Subsequently in 1987 some more female Rhinos (4 in number) were brought in from Nepal and released at Dudhwa. During the past few years some calves have been born there and at present the total number of Rhinos here stands at 11, which includes 4 calves. But there is one problem, only one breeding male is available at Dudhwa at present. For the success of this translocation we may have to wait for some time, but at the same time a little consideration in this direction should not be out of place.

3.6.3 If and when the status of Rhinos attains sufficiently high level in the Rhino-bearing protected areas, attempts should be made to identify some suitable areas, containing suitable natural habitat for the Rhinos, where some of the Rhinos may be released. It may be a better idea to look for such suitable areas close to the present Rhino areas, preferably in Assam and West Bengal and if need arises, further afield.

3.6.4 A lot of precautionary measures have to be taken before such a plan is executed. It is imperative to take a detailed ecological survey of the prospective areas and match the same with the conditions of the natural Rhino habitat. Only if the conditions are found ecologically conducive, further advance in

the plan will be possible. The future safety of translocated animals and their propagation must be guaranteed.

3.6.5 However, there are a few areas on or near the course of the river Brahmaputra, which maybe found suitable for such purpose. One such area is the 'Dibru -Saikhowa' Wildlife Sanctuary situated about 250 KM upstream of Kaziranga on the river Brahmaputra. An area of 640 Sq. Km. has been constituted as a wildlife sanctuary in 1986. The area resembles Kaziranga very much as far as the flora is concerned as also the ground conditions. But somehow the area has no record of supporting any Rhino population in the past. In any case this area, if found ecologically suitable may be one such area, where Rhino translocation will be quite easy.

3.6.6 There is a demand from West Bengal to translocate some Rhinos from Assam to "inject new blood", as the resident population is not quite large. Though Rhinos are heterohygos species and hence may not be in any real danger of genetic drift or depression, yet this proposal may probably be worthwhile to consider.

3.7 ORPHANAGE OR RESCUE HOME

Almost every year during the high floods, some young Rhinos, mostly suckling calves, are rescued by the Park people. As the swirling flood waters submerge the Park ground, all animals take refuge in higher grounds at first and when necessary migrate out of the Park, seeking shelter. During such migration these animals may have to swim across many kilometers of flood waters before reaching high ground. Naturally sometimes the calves on the heels of their mothers may get lost, due to their inability to follow the mother and also sometimes due to human disturbance, while crossing through populated areas.

3.7.1 Whenever such isolated baby Rhinos are found or reported, the staff first try to locate the mother, if she is nearby and drive the baby gradually towards her, so that both can meet. In most cases the babies are immediately accepted by the mothers. But in case the mother cannot be located, it becomes the duty of the Park staff to pick up the baby and nourish it in some enclosure. Such an enclosure of temporary nature is available at Kaziranga.

3.7.2 Sometimes such babies are found injured. On some occasions Rhino babies injured by tigers have also been recovered in the past. Naturally, in such cases immediate veterinary care is essential. Sometimes such Rhino calves are transported to the Guwahati Zoo, where very good veterinary care is possible. These rescued Rhinos are later sent to various Zoos in India and abroad. No attempt has so far been made to release them back in their natural habitat, though translocation of such rescued animals, once they are nourished to adulthood, may not be totally impossible.

3.7.3 However, a proper orphanage or rescue home should be maintained at Kaziranga, where such incidents are common. A veterinary unit is also available here, which can take care of the common veterinary problems.

3.8 VETERINARY CARE

In the larger protected areas there are a good number of domestic elephants, maintained for anti-poaching patrolling and also for taking the tourists around. Naturally adequate veterinary care for these elephants have to be ensured. For this reason generally the major protected areas have a veterinary unit attached with the wildlife administration. There is a veterinary surgeon with some field staff with him available all the time.

3.8.1 Unfortunately veterinary care for the wild animals on any research, worth mentioning, regarding veterinary aspects of the wildlife in general is almost totally absent. A lot of scope exists in this area. Only sometimes wounded wild animals are attempted to be offered veterinary care. For this some tranquilisation equipments are also available in the States and some people of the protected areas have also received training in tranquilisation methods.

3.8.2 It is felt essential that some well equipped veterinary centres are established in these protected areas. At present the State Veterinary Departments provides innoculation to the domestic stock of the fringe against some killer contageous disease like Rinderpest, Anthrax, Haemorrhagic scepticemia and foot and mouth etc. This measure ensures that the wild animals are kept free of the major epidemic diseases. In fact there is no record of the Rhino population being effected by any epidemic, though other species had been effected earlier.

3.8.3 Due to the rise in the population of the Rhinos and this concentration rising, the veterinary care has to be properly arranged,as it is not at all unlikely that some veterinary problem can crop up in near future.

3.9 MONITORING

Proper care is being taken to monitor the Rhino population in all the protected areas. These animals are residents of open grass land. With comparatively small home range and are large bodied. As a result it is not very difficult to monitor this population by the anti-poaching staff, who criss-cross the area regularly. Only during the floods this becomes extremely difficult, if not impossible in some of the areas.

3.9.1 Death of any Rhino, any injury or ailtment is generally promptly detected and reported. All deaths are intensively investigated so that the cause can be found out. A register is maintained, where all the deaths are recorded serially with the reasons and also with the information about what had happened to the horn. Birth of Rhino babies are not usually recorded in any register though such incidents are also reported from time to time.

3.10 DEVELOPMENTAL WORKS

When the Rhino Conservation Scheme was introduced a monitoring committee had also been set up with both Central and State Govt (Assam) as its members to keep a watch over the progress of works and proper and timely utilisation of the funds. Only on providing a completion certificate by the State Government about the utilisation of funds, next year's allocation was to be released.

3.10.1 It may however be mentioned here that flow of funds had not been always smooth due to delay in observing financial formalities. Release of funds to the Park authorities got delayed in some cases and the full quota of works could not be completed during the financial year.

3.10.2 Monitoring of the funding system should therefore be introduced, so that the current year's allocation reaches the protected area Directors / Field Directors latest by the month of 31st August. The protected area Director and his staff then will have enough time to complete his assigned works in time (upto 31st March, next) and plan for his next years work and budget. The Monitoring Cell /Committee may also like to see the physical works vis-a-vis the desired results of such planning.

3.11 ANTI-POACHING

The State Governments should also regularly monitor the cases of poaching of the Rhinos and the progress of the court cases, whenever any detection takes place. The help of the Police and the Civil Departments is absolutely essential in this regard and the Monitoring Cell should be formed with members from the Forest (Wildlife), Police and Civil Administrative Wings. In Assam there prevails a system of coordination meetings taking place between the Wildlife and the Police Authorities. This system can be extended and strengthened for the purpose.

3.12 LEGAL CELL

Inspite of the fact that the Wildlife Protection Act of 1972 by successive amendments has become quite stringent however the problem remains its effective implementation. It is felt that the field officers and the staff are not fully aware of the various provisions of the Act which results in its ineffective

implementation. Therefore, there is an urgent need to set up a Legal Cell in the State of Assam and West Bengal for training, preparing, prosecuting and monitoring wildlife cases in these States. Legal experts should assist in imparting training to the forest officials and staff in the preparation and prosecution of cases under the Act. The proposed Legal Cell should prepare a digest of important decided cases which could be used by the Department as precedents to strengthen their on-going cases. This will ensure proper and effective implmentation of the Act and would help in restricting poaching of Rhinos.

3.13 **FINANCIAL ASPECTS:**

The entire effort for conservation of the Rhino had initially been shouldered by the State Governments, as a part of the States' Forest Budget. The financial input had obviously been very small and grossly inadequate. With passage of time the pattern and intensity of management gradually changed. Naturally with more intensive management the financial input enlarged. Meanwhile Government of India also started providing financial support for the efforts taken up by the States, which augmented the thrust of conservation.

It may also be pointed out that most of the protection works are actually labour intensive and hence a large part of the fund will be utilised locally to the benefit of the fringe people. Work items like widening raising the road levels above flood level,desilting of water bodies and weed eradication etc. will generate a lot of man days. It is extremely difficult without making a detailed work estimate to quantify the exact man days that will be generated. But even so it may be said that about 55 percent of the funds will be utilised on such works.

3.14 FINANCIAL AND PHYSICAL OUTLAY AND PHASING

The following table will indicate the financial targets aimed at, with an indication of the financing expected to be available from the Central and the State Governments, on the basis of last three years figures :-

Figures in Millions of Indian Rupees.

	I Yr	II Yr	III Yr	IV Yr	V Yr	Total
Assam						
Funds Available	70.00	80.00	90.00	100.00	110.00	450.00
Funds to be raised	30.00	45.00	50.00	40.00	40.00	205.00
West Bengal						
Funds Available	7.665	8.840	8.845	9.025	9.725	44.10
Funds to be raised	8.275	16.5	12.795	4.765	2.665	45.00

(Total funds to be raised (205+45) or 250 million Rupees.)

3.14.1 It should be noted that wildlife management has already been given high priority in the Forestry budget. In Assam the wildlife budget is as high as around 20% of the total Forestry Budget. Most major protected areas in Assam hold Rhino populations and therefore is being dealt with priority. But the total Forestry budget itself is very poor and inadequate, compared to the requirement.

Besides normal expenditure incurred in the protected areas, several schemes have also been introduced in these areas for better and more intensive management. These are :-

3.14.2 State Schemes

i) Improvement/strengthening of W.L. organisation.
ii) Development/management of other wildlife areas.
iii) Development/management of the protected areas.
iv) Development/management of Assam State Zoo (captive breeding).
v) Development of Botanical garden (Zoo).

3.14.2 Central Sector Schemes on 50% : 50% sharing basis

i) Project Tiger (Manas)
ii) Barnadi W.L.Sanctuary
iii) Nameri W.L.Sanctuary
iv) Control of Poaching
v) Captive breeding & rehabilitation
vi) Guwahati Zoo
vii) Education-cum-interpretation programme
viii) Development of Kaziranga National Park

3.14.3 100% Centrally Assisted Schemes.

i) Development of Pobitara W.L.Sanctuary
ii) Eco-development
iii) Rhino Conservation

3.14.4 The above schemes cover all or parts of the Rhino habitats, so, about 70% of the scheme finance is available for Rhino conservation. It may also be mentioned here that most of the centrally assisted (100% Centrally Assisted) Schemes now stands transferred to the State for administrative reasons.

3.14.5 **Physical Targets**

The following items of works have been selected to be funded, if and when funding is available.

3.14.6 Habitat improvement, including extension

i) Creation of high lands for sheltering wild animals during floods.

ii) Acquiring high land to be added to the natural habitat of the Rhino as an added measure to provide shelter to the Rhinos during floods.

iii) Deepening of the silted up water bodies and revival of old water courses.

iv) Eradication of exotic weeds and water hyacinth for improvement of fodder.

v) Soil conservation measures.

3.14.7 Management

i) Strengthening communication network
ii) Strengthening anti-poaching measures
iii) Strengthening enforcement and legal proceedings
iv) People's awareness and nature interpretation
v) Improving veterinary care and research
vi) Training and research
vii) Relocation of villages

3.14.8 Eco-development programme in the fringe areas.

This programme will be site-specific as such planning will involve peoples' participation in planning and also implementation. Some of the salient priority activities, as identified by the Government of India for eco-development, as mentioned below, may be taken up.

a) Micro level eco-development planning

b) Initiation of eco-development activities aimed at environmental conservation, biomass generation, income generation and protected area management.

c) Human resource development

d) Research and development

e) Environmental education and awareness

f) Monitoring

Besides, some other activities may be taken up prior to or concurrent with the project, more as a support than as a part of the project. These are -

i) Preliminary indicative planning
ii) Eco-development training for the Park Directors / Field Directors and other officers.
iii) Management planning.

3.14.9 Captive breeding, translocation and rescue home.

3.14.10 Monitoring

The demand for funds for the State of Assam is actually much higher than what has been projected here. Only the more important and salient programmes have been included in this plan.

LIST OF ABBREVIATIONS USED

ACF	Assistant Conservator of Forests
CAS	Centrally Assisted Scheme
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
CSS	Central Sector Scheme
CWLW	Chief Wildlife Warden
DBBL	Double Barrel Breach Loading
DFO	Divisional Forest Officer
DIVN	Division
DY CWLW	Deputy Chief Wild Life Warden
FD	Field Director
FDTP	Field Director Tiger Project
Govts.	Governments
KNP	Kaziranga National Park
NP	National Park
NGOs	Non-Governmental Organisations
PCCF	Principal Chief Conservator of Forests
SBBL	Single Barrel Breach Loading
Sq.Km	Square Kilometre
UP	Uttar Pradesh
WII	Wildlife Institute of India
WL DIVN	Wildlife Division
WLS	Wildlife Sanctuary
WLW	Wildlife Warden
Yr	Year

ANNEXURES

ASSAM STATE

Some relevent informations about Assam

a. Total geogaphical area of Assam in = 78,579 Sq. km

b. Total forest area of Assam = 30,708 Sq. km

C. Forest area by legal status in sq. km:-

Reserved Forests	17,568
Proposed Reserved Forests	3,921
Unclassed State Forests	9,219
	30,708

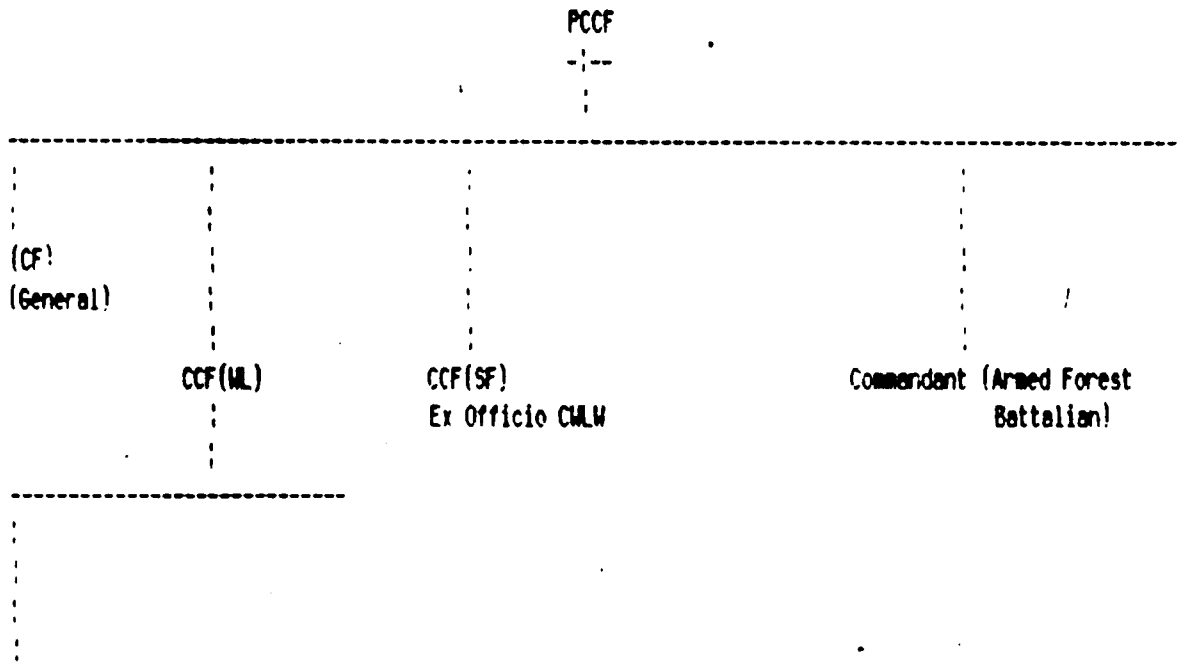
d. Areas of each prtected areas: (in Sq. Km)

1. Kazirange National Park	NP 74	430
2. Manas National Park & Tiger Res.	90	500
3. Lackhowa W.L.Sanctuary		70
4. Barnadi W.L.S.		26
5. Orang (Rajiv Gandhi) WLS		72
6. Pobitara WLS		18
7. Garampani WLS		6
8. Dibru -Saikhowa WLS		640
9. Nameri WLS		130
10. Sonai Rupai WLS		175
11. Pobha Buffalo Sanctuary		69
12. Deeper beel WLS		4
13. Kachugaon W.L.S.		216
Total area		2334 Sq. km

e. Protected area as percentage of geographical area and forest area:-
Protected area 2334 sq km = 2.97% of Geographical area of Assam
= 7.60% of Forest area of Assam

f. Human population (1991) and density per sq. km
Human population (1991) = 2,20,05,000 (1991 Census)
Density per sq.km = 281.397 % per sq km of total geographical area

Administrative structure of Wildlife in Assam Administration



A-I

ASSAM

Particulars on Forests

1. Forest Revenue

(Rs. in lakhs)

	Timber	Others	Total
1989-90	603.04	583.20	1186.24
1990-91	891.60	630.44	1522.04
1991-92	1086.06	634.16	1720.22
1992-93	1200.00	600.00	1800.00 (Provisional)

2. Total Expenditure against Forests

	Non-plan	Plan	Total
1989-90	1752.59	1892.22	3644.81
1990-91	2589.34	2244.93	4834.27
1991-92	2593.76	2678.38	5272.14
1992-93	2863.37	3345.00	6208.37 (Provisional)

3. Outlay against Wildlife

	Non-plan	Plan	C.S.S.
1989-90	171.47	181.00	351.79
1990-91	276.95	260.00	395.00
1991-92	229.51	268.00	391.00
1992-93	254.33	281.00	416.00

4. Expenditure against Wildlife

	Non-plan	Plan	
1989-90	209.93	532.79	
1990-91	302.32	677.45	
1991-92	229.51	643.00	(Provisional)
1992-93	254.33	493.00	(Anticipated)

Schemewise Allocation of funds in Assam

Name of schemes	Sanctioned outlay		
	1989-90	1990-91	1991-92
A. State Plan Schemes			
Improvement/strengthening of Wildlife Organisation	12,20,000	21,60,000	25,10,000
Development/management of other Wildlife areas	31,00,000	45,00,000	25,10,000
Dev/Management of protected areas	58,98,000	74,84,200	83,57,743
Dev/Management of Assam State Zoo	17,00,000	19,99,500	21,95,600
Development of Botanical Garden	4,00,000	7,50,000	8,00,000
Total of A	1,23,18,000	1,68,93,700	1,76,10,143

B. 50:50: Centre Sector Scheme	Sanctioned outlay 1989-90	1990-91	1991-92
Project Tiger	82,16,000	64,23,500	100,00,000
Barnadi Wildlife Sanctuary	-	4,79,000	8,00,000
Nameri Wildlife Sanctuary	2,17,000	5,17,000	7,50,000
Control of Poaching	4,00,000	6,56,000	6,40,000
Captive Breeding and Rehabilitation	2,60,000	3,80,000	4,00,000
Guwahati Zoo	4,00,000	6,60,000	-
Education-cum-Interpretation Programme	-	3,20,000	-
Development of K N P	-	-	-
Total of B Rs.	94,93,000	94,35,500	2,20,25,500

Statement showing the yearwise release and sanction of scheme "Rhino Conservation" (CSS) in Assam since inception showing also the areawise break-up and expenditure on salary.

Year	Amount released by Govt. of India	Amount sanctioned by Govt. of Assam	Fund utilised	Unutilised bal. against the yr.	Accumulated unutilised bal. for the year	Break up of division wise provision		Salary
1.	2.	3.	4.	5.	6.	7.		8.
1986-87	Rs. 40 lakhs	Rs. 40 lakhs	36,29,388	3,70,612	3,70,612	KNP	17,16,000	2,65,000
						Manas	8,64,000	
						Pabitora	4,46,000	
						Orang	4,54,000	
						Laokhowa }		
						Burachapori & }	4,90,000	
						Kochmara }		
						C.W.L.W.	30,000	
1987-88	(Total Rs. 92,80,000	Total 92,80,000	91,60,659	1,19,341	4,90,153	KNP	54,20,000	18,69,000
	Rs. 66,00,000	Rs. 66,00,000				Manas	18,02,000	
						Pabitora	7,71,000	
						Orang	2,96,000	
						Laokhowa }		
	Rs. 26,80,000	Rs. 26,80,000				Burachapori & }	7,31,000	
						Kochmara }		
						C.W.L.W.	50,000	
	(unspent amount released Rs.3,70,612/-)	Rs.3,70,612/-						
1988-89	(Total Rs. 1,75,00,000	Rs. 1,00,00,000	71,30,962	03,69,038	1,08,59,191	KNP	1,24,24,000	84,89,000
	Rs.74,14,000					Manas	86,03,000	
	& Rs. 1,00,86,000					Pabitora	19,02,000	
						Orang	17,35,000	
						Laokhowa }		
						Burachapori & }	9,80,000	
						Kochmara }		
						C.W.L.W.	1,00,000	
1989-90	No fresh sanction (unspent amount Rs. 1,08,59,191)	Rs.1,08,59,191	81,87,852	26,71,339	26,71,339			
1990-91	(Total 1,23,50,193)	(Total 1,23,50,193)	1,14,51,964	8,98,229	35,69,568	KNP	51,87,191	73,50,000
	Rs. 1,15,53,191	Rs.1,15,53,191				Manas	28,04,000	
	& Rs.7,97,000	Rs.6,13,000				Pabitora	9,25,000	
		Rs. 1,84,000				Orang	13,04,000	
						Laokhowa }		
						Burachapori & }	14,73,000	
						Kochmara }		

Amount Sanctioned

Name of the Scheme	1989-90	1990-91	1991-92
C. 100% Centre Sector Scheme (CSS)			
Rhino Conservation	-	1,23,50,193	1,69,20,500
Development of Pobitara Wildlife Sanctuary	6,40,500	12,30,700	-
Project Elephant	-	-	17,00,000
Eco -Development	-	-	-
Total of C	6,40,500	12,30,700	17,00,000
Grand Total (A+B+C)	Rs. 12,88,05,788/-		
NON-PLAN	1,71,47,000	2,76,95,000	2,29,51,000

Assam

Various schemes and related expenditure

Following are the expenditure under various scheme since 1986-87 in the state of Assam.

Scheme	Years	Sanction Amount			Remarks
		Salary	Works	Total	
Rhino Conservation in Assam (100% centrally sponsored Scheme)	1986-87	50,000/-	10,20,000/-	10,70,000/-	
	1987-88	4,00,000/-	27,72,426/-	27,70,000/-	
	1988-89	23,40,000/-	5,00,000/-	28,40,000/-	
	1989-90	16,00,000/-	49,55,191/-	65,55,191/-	
	1990-91	30,65,191/-	21,10,751/-	51,75,942/-	
	1991-92	36,22,733/-	18,02,267/-	54,25,000/-	
	1992-93 (upto Feb 93)	39,99,996/-	No sanction has yet been received. Only expenditure upto Feb 93 is shown.		
Development & Management of protected areas (100% State Govt. sponsored)	1986-87	5,09,312/-	27,12,426/-	32,81,738/-	
	1987-88	6,65,040/-	18,99,720/-	25,64,760/-	
	1988-89	7,18,730/-	21,84,950/-	28,98,680/-	
	1989-90	7,85,000/-	19,24,950/-	27,09,950/-	
	1990-91	9,19,000/-	24,76,121/-	33,95,121/-	
	1991-92	6,75,000/-	1,50,000/-TA 22,10,242/- W	30,35,242/-	
	1992-93 Feb 93)	5,89,211/-	20,31,106/-	26,20,317/-› Only expenditure upto Feb 93 is shown.	
Control of poaching and illegal Trade (50% by State)	1986-87	-	-	-	
	1987-88	-	2,82,000/-	2,40,000/-	
	1988-89	-	-	4,00,000/-	
	1989-90	-	-	4,00,000/-	
	1990-91	-	6,40,000/-	6,40,000/-	
(50% by Central Govt)	1991-92	-	6,40,000/-	6,40,000/-	
	1992-93 Feb 93)	-	25,167/-	25,167/-› Only expenditure upto Feb 93 is shown.	
Ammunition to Forest Staff & labours.	1986-87	-	-	5,81,000/-	
	1987-88	-	-	1,80,000/-	
	1988-89	-	-	55,000/-	
	1989-90	-	-	55,000/-	
	1990-91	-	-	No sanctioned.	
	1991-92	-	-	No sanctioned.	
Development of Kaziranga National Park	1987-88	-	-		
	1988-89	-	-	2,00,000/-	
	1989-90	-	-		
	1990-91	-	-		
	1991-92	-	-		
Interpretation Centre	1989-90	-	-	Nil	
	1990-91	-	-	3,20,000/-	
	1991-92	-	-	Nil	

1.	2.	3.	4.	5.	6.	7.		8.
1991-92	(Total 1,69,20,500	Total 1,69,20,500	1,33,60,810	35,59,690	71,29,258	KNP	72,25,000	80,00,000
	Rs.50,000	Rs.50,00,000				Manas	34,50,000	
	Rs.42,45,000	Rs.42,45,000				Pabitora	19,20,500	
	Rs.19,20,500	Rs. 19,20,500				Orang	18,00,000	
	Rs.57,55,000					Lankhowa }		
						Buracha Pori &	24,00,000	
						Kochsara }		
Upto 1991-92	Rs.6,00,50,691/-	Rs.5,25,50,691/-	5,29,21,435/-					
1992-93	Rs. 75,00,000/-	Rs. 75,00,000/-						
	Rs.6,75,50,693/-	Rs. 6,00,50,691/-						

Wildlife Wing on-going schemes during 1993-94 with approved outlays

	Schemes	Outlays (Rs. in lakhs)
A.	State Plan Schemes	
1.	Strengthening of Wildlife organisation	30.00
2.	Development/management other Wildlife areas	50.00
3.	Development/Management of protected areas	100.00
4.	Development/Management of State Zoo	27.00
5.	Development of Botanical Garden	9.00
6.	Rhino Conservation (transferred 100% C.A. Scheme)	5.00
7.	Assistance for control of poaching and illegal tade (transferred 50/50 C.S.Scheme)	4.00
		225.00 lakhs

	B. 50:50 C.S.Scheme		50% C.A.	100% C.A.
1.	Project Tiger	38.00 +	38.00	-
2.	Asstt. to Guwahati Zoo	3.00 +	3.00	-
3.	Asstt. for Development of K N P	3.00 +	3.00	-
4.	Asstt. for Barnadi W.L. Sanctuary	3.00 +	3.00	-
5.	Assistance for Barnadi W.L. Sanctuary	3.00 +	3.00	-
6.	-do- for captive breeding etc.	3.00 +	3.00	-
7.	-do- for W.L. Education-cum-Interpretation	3.00 +	3.00	-
		56.00 +	56.00	

	C. 100% Central Assistance Scheme			
1.	Development of Wildlife Sanctuary	-	-	30.00
2.	Project elephant	-	-	100.00
	Grand Total	281.00 +	56.00 +	130.00

NON-PLAN EXPENDITURE FOR THE YEAR 1990-91, 1991-92 AND 1992-93
OF THE FOLLOWING AREAS

DIVISION	1990-91	1991-92	1992-93
Director, Kaziranga National Park	68,11,346,27	76,74,335.97	78,24,095.65 (Upto Feb /93)
Field Director Tiger Project	20,64,896.71	30,12,021.84	20,20,702.64 (Upto Feb/93)
Western Assam Wildlife Division	44,19,167.60	21,26,698.90	15,62,518.23 (Upto Jan/93)
Nagaon Wildlife Division	8,32,140.51	19,90,830.38	17,50,949.79 (Upto Jan/93)

PLAN

Director, K N P	36,67,406	33,94,060	30,41,128
Field Director, Tezpur	91,639	1,05,294	29,000
Nagaon (Wildlife) Division	24,60,518	25,63,937	18,25,496
Mangaldoi, Wildlife Division	6,43,000	6,46,853	2,25,839

Statement showing the death of Rhino due to poaching & natural causes in Assam during 1990

Name of Divisions/	POACHING				NATURAL			
Year 1990	No. of Poaching	H.R.	H.M.	H.N.D.	No. of natural	H.R.	H.M.	H.N.D.
1	2	3	4	5	6	7	8	9
1. D.F.O. E.A. W.L. DIVN East Assam Wildlife Divn	34	5	29	-	58	37	3	18
2. D.F.O. NAGAON W.L. DIVN Pobitara	2	-	2	-	2	2	-	-
3. D.F.O. NAGAON DIVN	3	-	3	-	1	-	1	-
4. D.F.O. K.A. EAST DIVN FIFHU	3	-	3	-	-	-	-	[illegible]
5. D.F.O. MANAS (TIGER & RESERVE)	1	-	1	-	3	[illegible]	-	-
6. D.F.O. W.A. W.L. DIVN West Assam Wildlife Divn	-	-	-	-	1	1	-	-
7. D.F.O., DARRANG EAST DIVN	-	-	-	-	2	1	1	-
TOTAL	43	5	38.	-	67	43	5	19

Abbreviations

H R : Horn removed

H M : Horn missing

H N D : Horn not developed.

Statement showing the Poaching & Natural Death during 1991 in Assam

Name of Divisions/	POACHING				NATURAL			
Year 1991	No. of Poaching	H.R.	H.M.	H.N.D.	No. of natural	H.R.	H.M.	H.N.D.
1	2	3	4	5	6	7	8	9
1. D.F.O.E.,E.A.W.L.DIVN	15(IN) 3 (OUT)	8 *	10 4	* *	30	54	2	24
2. MANAS	2	1	1	*	2	2	*	1
3. D.F.O., NAGAON W.L.DIVN	1	*	1	*	1	1	*	-
4. D.F.O., NAGAON DIVN	1	1	*	*	NIL	NIL	NIL	NIL
5. D.F.O.. K.A. EAST DIVN DIPHU	1	*	1	*	NIL	NIL	NIL	NIL
6. D.F.O.. MANGOLDOI W.L. DIVN	1	*	1	*	NIL	NIL	NIL	NIL
7. D.F.O., W.A. W.L. DIVN (TEZPUR)	NIL	NIL	NIL	*	3	3	*	*
TOTAL	28	10	18	*	37	60	2	25

Abbreviation

HR = Horn recored
HM = Horn missing
HND = Horn not developed

Post created by the Govt. of Assam under the Rhino Conservation Scheme.

	FR.	Dy.R.	Fr.I	Fr.II	Fgd.	R.Astt.	Driver	B.man	Total FR.
K N P	-	2	17	10	63	-	4	20	116
K N P Expansion	1	2	10	8	70	1	1	-	93
Manas (WL)	-	-	-	10	44	1	1	-	56
Manas Expansion	-	3	17	10	90	2	1	-	123
Laokhowa/Bura-chapori (Kochmara Complex)	-	-	-	15	50	1	3	-	69
Orang W.L.S.	-	1	6	5	12	1	2	-	28
Pabitora Sanctuary area	1	1	4	4	12	1	2	-	32
Total	2	2	54	62	347	7	16	20	517

Details of Housing, Transport, Wireless sets, Firearms in National Parks and Wildlife Sanctuaries.

National Park/Wildlife	Housing		Transport			RTs			Firearms		
	Sr.	Jr.	Light	Heavy medium	Heavy	Water Craft	Fixed	Mobile	Rifle	Gun	Pistol
KNP	2	86	7	2 Truck 1 Tractor		Nil	6	25	147	40	5
Manas	2	64									
Orang Wildlife Sanctuary	1	17	3	2	x	x	1	9	20	7	
Pabitora	2	10	1	1	x	x	2	7	10	1	
Laokhowa	1	09	1	1	x	x	1	3	5	4	
WAWL Tezpur	1	15	2	x	x	x	1	›	1	1	
Berradpur & Kochmara	1	15	2	x	x	x	1	nil	1	1	

KAZIRANGA NATIONAL PARK

Some information about Kaziranga National Park

The total area of the Kaziranga National Park is 430 Sq.Km (core area).

The proposed addition area is as under :

i)	Ist addition (Burapahar) (for this the preliminary Notification has already been given and for Land Acquisition cases 4 & 5 final notification is also out)	- 43.79
ii)	IInd Addition (Sildubi)	- 6.47
iii)	IIIrd Addition(Panbari)	- 0.69
iv)	IVth Addition (Kanchanguri) (For this area the final notification has been given)	- 0.89
v)	Vth Addition (Haldhibari)	- 1.15
vi)	VIth Addition (Brahmaputra) (This is pending in High Court)	- 401.50
	Total	- 455.00 sq.km.
vii)	Karbi Anglong area 32 sq.k.m. (not finalised).This was taken up in 1971 to include within the Kaziranga National Park but till now nothing has come through.	- 430.00 sq.km.
	As such total area of Kaziranga National Park including additions are	+ 455.00 "
		885.00 Sq.km.
	And total geographical area under jurisdiction of Eastern Assam Wild Life Division cover	Approx.2000 sq.km.

27.98% of the total park area is covered by tree forests, 66.44% by grass lands and 5.88% by water bodies.

Staff at Kaziranga National Park

A. Gazetted

1.	Director (Conservator of Forest rank)	- 1
2.	D.F.O. (Dy. C.F. rank)	- 1
3.	Assistant Conservator of Forest	- 1
4.	Forest Rangers	- 6

B. Non Gazetted

5.	Grade III i) Forester I ii) Forester II iii) Forest Guard iv) Game watcher	223
6.	Grade IV i) Elephant Mahut ii) Elephant Attendant iii) Boatman iv) Chowkidar	122
	No. of field staff (grade III) trained in Forest School	- 40
	No. of field staff (grade III) trained for handling arms	- 24

C. Some home guards are also employed besides the above regular forest staff. - 75

Kaziranga

Records of Animal Census

Attempt to carry out Census of animals in the Kaziranga National Park was carried out in 1966 for the first time since then in the gap of every 6 years Census is carried out. In 1990 Census could not be completed due to rain etc. consequently in 1991 March Census was conducted.

The population figure of animals as per direct count are as follows :

		1966	1972	1978	1984	1991
1)	Rhino	366	658	939	1080	1129
2)	Elephant	349	422	773	525	515
3)	Wild Buffalo	471	555	610	677	1090
4)	Gaur	1	18	23	30	5
5)	Swamp deer	213	516	697	756	635
6)	Sambar	120	105	215	358	55
7)	Hog deer	13	4551	6855	9872	2911
8)	Wild Boar	155	522	733	3645	555
9)	Tiger	20	30	40	52	50

	1993
Rhino	1164 (March 1993)

+

Arms, equipments & other facilities (Kaziranga National Park)

The total number of serviceable arms is 175 ('315 Rifle, SBBL and DBBL Gun) and 4 numbers are unserviceable. Apart from this there area 10 American Rifles, one 0.470 DBBL rifle, one 0.404 Rifle (all are unserviceable) and 5 Revolvers. These arms require frequent repairing therefore further addition of arms is needed.

Wireless: The total number of wireless sets in the Division are 40. Out of which maximum are unserviceable and under repairing.

Fixed Station	Mobile phone	Protophone	Total
6 Nos	9 Nos	25 Nos	= 40 Nos.

4 Nos. of Solar Panels are fixed in different camps to facilitate charging of batteries for the wireless set.

Artificial High Lands

After devastating flood of 1987-88 when casuality of maximum animals took place, about 68 Nos. of Highlands were raised inside the National Park to facilitate shelter for marooned animals during flood as mentioned below :-

	Length in mtr.	Nos.	Location
	1650 Mtr.	1 No.	Eastern Range
	1000 "	2 Nos	Western Range
	200 "	9 "	Eastern Range
	100 "	22 "	[Kaziranga Range
			[Eastern Range
	350 "	2 "	Eastern Range
	30 "	29 "	Kaziranga Range
			Western Range
	25 "	3 "	Eastern Range
Total	3355	Total 68 Nos	

Floating Camps: There are 2 Nos. floating camps viz. Hawk Float, and Samrat in the Brahmaputra river to prevent intrusion of poaching from Northern side of the National Park.

Camps : There are total 103 Nos. of camps in addition to Range headquarters. These camps are of permanent, semi-permanent and of very temporary nature. These camps get damaged during the flood and are shifted as per strategic requirement every year.

Central Camp: There is one Central camp in the centre of the Western Range to facilitate reinforcement to various others camps at the time of encounter or need.

Country Boats

To facilitate the anti-poaching activities as well as to supply rations and other logistic support to the staffs at different camps situated in the interior part of the Country boats are the only means of transport during the rainy season. There are total 88 Nos. of country boats. Every year at least 5 Nos. of boats get damaged by the wild animals.

Speed Boats

Though there are 12 boats with fitted with out board motors but not in a good shape. Required better quality to facilitate quick movement for anti-poaching.

Kaziranga National Park

Mortality of Rhinos due to poaching and Natural

The figures of Rhinos (death due to poaching and due to natural causes are as follows :-

Year	Poaching			Total	Natural	Total mortality
	Pit	Gunshot	Electro-cution			
1980	11	0	-	11	58	69
1981	22	2	-	24	39	63
1982	19	6	-	25	48	73
1983	31	6	-	37	46	83
1984	14	14	-	28	50	78
1985	23	21	-	44	37	81
1986	18	27	-	45	38	83
1987	6	17	-	23	41	64
1988	7	17	-	24	105	129
1989	12	29	3	44	54	98
1990	4	29	2	35	57	92
1991	4	18	1	23	79	102
1992	2	44	2	48	67	115
1993 as on 7.3.93	-	15			12	27

Comparative monthwise statement of poaching of Rhinos for the years 1989, 1990 and 1991 and 1992 as shown below

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
1989	1	3	3	5	3	5	1	2	2	4	6	9	44
1990	11	4	3	3	2	-	1	1	1	2	5	2	35
1991	2	3	2	4	2	1	1	2	-	1	1	2+2	23
1992	4	3	7	5	3	3	3	3	1	5	4	7	48
1993	4	10	3	1									

Kaziranga National Park

Poachers Apprehended

Sl.No./ Year	Number of persons arrested	Numbers of Arms recovered	Remarks
1. 1986	43	5	
2. 1987	29	3	
3. 1988	13	4	
4. 1989	18	2	
5. 1990	49	3	
6. 1991	25	5	
7. 1992	58	10	

Numbers of poachers killed in encounters = 9 during 1992 and 3 during 1993 (upto 31st March).

Kaziranga National Park

Revenue: Since 1985-86

Year	Revenue	Remarks
1985-86	2,96,724.50	Revenues are earned from minor forest produce collected from the areas outside the National Park but falling under the jurisdiction of this Division and from the visitors.
1986-87	3,11,390.96	
1987-88	3,92,792.62	
1988-89	5,08,108.54	
1989-90	3,36,459.00	
1990-91	3,56,915.00	
1991-92	5,72,333.00	

WEST BENGAL

(Jaldapara / Gorumara)

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WEST BENGAL

Some relevant information about the State of West Bengal

Total Geographical Area of the State	88,752 Sq Km
Population of the State as per 1991 Census	67.88 Million
Percentage of total area under cultivation	60.3%
" " " " forest	13.4%
" " " of land which is barren / unculturable	26.3%
Total forest area in the State	11,879 Sq. km
Total protected area network in the State	3960 Sq. Km

Percentage of protected area

(a) To geographical area	=	4%
(b) To forest area	=	13%
Density of human population per sq.km	=	764.82

Organisational Structure of the Wild Life Wing

Minister of Environment & Forests

Secretary, Forest Department (Administration)

Principal Chief Conservator of Forests (P.C.C.F.) (Operations)
Chief Wild Life Warden (C.W.L.W.)

Dy.C.W.L.W.,Central Circle			Dy. C.W.L.W.,Sunderban	Dy.C.W.L.W.,Northern Circle	Dy. C.W.L.W.,Hill Circle		Dy. C.W.L.W.,Calcutta & Howrah	
Wildlife Warden(WLW), Malda-West Dinajpur (Raiganj Sanctuary)	WLW, Birbhum. Ballavpur Sanctuary	WLW Burdwan Ramna-bagan Sanctu-ary	WLW Nadia Mur-shida-bad Bethuada-hari and Bibhuti Bhusan Sanctuary	WLW.24-Parganas Narendrapur. Lothian and Hali-day Sanctuaries	WLW, Jalpaiguri Gorumara and Chapramari Sanct-uaries	WLW,Darjeeling Senchal and Jorepokhri Sanct-uaries)	WLW-I Mahananda Sanctuary and Neora and Singhalila Park	WLW -II Jaldapara Sanctuary

Field Director, Buxa Tiger Reserve

Deputy Field Director

Field Director, Sundarban Tiger Reserve

Deputy Field Director

Checklist of protected areas of West Bengal

Area in Km^2

Sl No.	Name	National Park	Sanctuary	Reserve Forest	Total area
1.	Sunderban Biosphere Reserve				
	a) Sunderbans Tiger Reserve	1330.10	-	892.60	
	(i) Sajnakhali	-	362.40	-	2585.10
	b) 24-Parganas Division				
	(i) Holiday Island	-	5.95	-	
	(ii) Lothian Island	-	38.00		
2.	Buxa Tiger Reserve	117.10	251.89	389.83	758.82
3.	Singalila	78.60	-	-	78.60
4.	Neora Valley	88.00	-	-	88.00
5.	Jaldapara	-	216.51	-	216.51
6.	Gorumara	-	8.52	-	8.52
7.	Chapramara	-	9.49	-	9.49
8.	Mahanenda	-	127.22	-	127.22
9.	Senchal	-	38.88	-	38.88
10.	Jorepokri	-	00.04	-	00.04
11.	Raiganj	-	1.30	-	1.30
12.	Ballavpur	-	2.00	-	2.00
13.	Bethuadahari	-	0.67	-	0.67
14.	Rasmabegan	-	0.14	-	0.14
15.	Bibhutibhushan	-	0.64	-	0.64
16.	Narendrapur	-	0.10	-	0.10
	Total	1613.80	1063.75	1282.43	3959.98

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Composition of staff employed in Wildlife Sector in West Bengal

Authority	Number of Administrator	Number of Works Staff	Number of Field Staff	Total
Control and Supervision	4	32	20	56
Park Management	15	199	777	991
Total	19	231	797	1047

Fluctuation in Rhino Population

Year	Jaldapara	Gorumara
1955-56	Not recorded	5
1956-57	65	8
1958	Not recorded	7
1958-59	Not recorded	4
1964 (May)	72	Not recorded
1965	Not recorded	14
1965-66	75	10 (including 2 calves)
1968-69	80(incl.5 calves)	12 (including 2 calves)
1971-72	Not recorded	13
1972-73	Not recorded	7
1975	23	Not recorded
1978	19	6-8
1980	22	Not recorded
1985	14	8
1988 (April)	24	Not recorded
1989 (February)	27	13
1992 (April)	33	Not recorded

West Bengal

Population of Rhino in Jaldapara Wildlife Sanctuary

Year	No. of Rhino
1980	22
1988 (April)	24
1989 (Feb)	27
1992 (April)	33

Facilities available at Jaldapara and Gorumara Wildlife Sanctuaries

	Housing		Transport				Radio Communi-	Firearms	
	Junior	Senior	Light	Trucks	Elephant	Water Craft	cation	.315	Shotguns
Jaldapara	6	124	2	1	16	3	26	10	38
Gorumara	-	21	1	-	2	-	4	-	4

WEST BENGAL

The details of expenditure incurred for Wildlife Schemes both Central component and State component for the last 3 years (199-91 to 1992-93 are mentioned below:

Rs. in Lakhs

Name of Schemes	Plan Expenditure 1990-91			1991-92			1992-93			1993-94 (Proposed)		
	Central	State	Total	Central	State	Total	Central	State	Total	Central	State	Total
1. Sunderban Tiger Reserve	33.25	14.85	48.10		16.	58.90	27.70	18.05		50.000	20.00	70.00
2. Buxa Tiger Reserve	26.58	15.68	42.26			48.23	41.44	16.30		65.00	200.00	85.00
3. Jaldapara Wildlife Sanctuary	4.50	2.00	6.50			7.88	4.25	4.08		6.00	5.00	
4. Mahananda Wildlife Sanctuary	4.48	2.00	6.48			6.97	4.40	2.80		5.00	3.00	8.000
5. Neora Valley National Park	2.00	-	2.00			2.00	5.00	2.00		5.00	2.00	7.00
6. Singalila National Park	2.00	-	2.00			6.98	5.20	1.99		5.55	2.00	7.55
7. Senchal Wildlife Sanctuary	1.50	-	1.50				1.75	1.00		2.00	1.00	3.00
8. Captive Breeding	1.26	-	2.52									
9. Control of Poaching	2.55		5.05			4.72					3.00	3.00
10. Nature Education & Intepretation	0.98	-										
11. Elephant Project				10.00		10.00	4.68			1.50	-	1.50
12. Eco-development Secheme												
(i) Sunderban Tiger Reserve				4.15	-	4.15		-	9.00	20.00	-	20.00
(ii) Buxa Tiger Reserve				7.95	-	7.95	16.75	-	16.75	54.00	-	54.00
(iii) Mahananda W.L.S.						0.50	-	0.50	4.00	-	4.00	
(iv) Jaldapara W.L.S.						6.62	-	6.62		10.00		10.00
(v) Senchal W.L.S.							1.30	-	1.30	7.0	7.00	
13. Protection & improvement of Wildlife etc.	-	29.66	29.66	-	44.68	44.68	-	38.86	38.86	-	90.80	90.80
14. Wet land Development											2.00	2.00
Total	79.10	58.93	148.03				164.79	-	-		383.50	

Non-plan expenditure during the last three years are as below:

Non-plan Expenditure

Year	Amount (Lakhs)	
1990-91	297.60	
1991-92	549.50	Due to Buxa inclusion
1992-93	578.80	" "

Revenue Rs. 60 million as shown in the Rhino Action Plan includes the revenue of Buxa Division.

Death cases of Rhinos during 1990-91 to 1992-93 are mentioned below :

1990-91	1 No	Poaching
1991-92	2 Nos	Poaching
1992-93	1 No	Poaching

Jaldapara Sanctuary:-

Previous area = 115.53 Km^2

Addition = 100.98 Km^2

Present area = 216.51 Km^2

Projects Requiring Complete Funds

(Figures in Million)

No.	Database Number	Title	Project Activity	Budget Rupee
1.		Construction of boundary wall and energised fence at Jaldapara Sanctuary	Park Management	19.20
2.		Revival of old river course at Jaldapara Sanctuary	Park Management	7.00
4.		Translocation of rhinos from Assam	Research	4.00
5.		Relocation of forest villages	Park Management	2.00
6.		Social facilities for Park personnel	Park Management	2.60
7.		Strengthening and support to field positions	Security	2.40
8.		Eco-development	Park Management	7.8
			Total :	45.00

Yearwise Fund Outlay

	Yr -I	Yr-II	Yr-III	Yr-IV	Yr-V	Total
Fund needed	Rs. 7.5	15.5	13.1	5.3	3.5	4.5