



REJUVENATION AND CONSERVATION OF SAUJ JHEEL OF MAINPURI SOCIAL FORESTRY DIVISION



Social Forestry Division, Mainpuri

Integrated Management Plan for Sauj Jheel, Mainpuri

Jheel Name	Sauj jheel, Mainpuri
Jheel Area(in ha)	40.7590 ha
Area Of Zone Of Influence	~ 179.993 ha
Significance	Provide habitat for large population of the Sarus crane
Name of the nodal agency for implementation of the project	Environment, Forest and Climate Change Department Govt. of Uttar Pradesh (Social Forestry Division, Mainpuri)

Objectives:

1. To survey, analysis of physical factors and human settlement
2. To Evaluate the major threats of jheel
3. To check the soil erosion in catchment areas and increase water availability in the jheel
4. To improve the habitat, nesting and roosting sites for the *Sarus crane*
5. To develop this site for eco-tourism.
6. To make a detailed plan for monitoring and patrolling during the winter season when migratory birds are landed here.
7. To ensure local people's participation to conserve and protect the jheel.



Chapter 1

1. Introduction

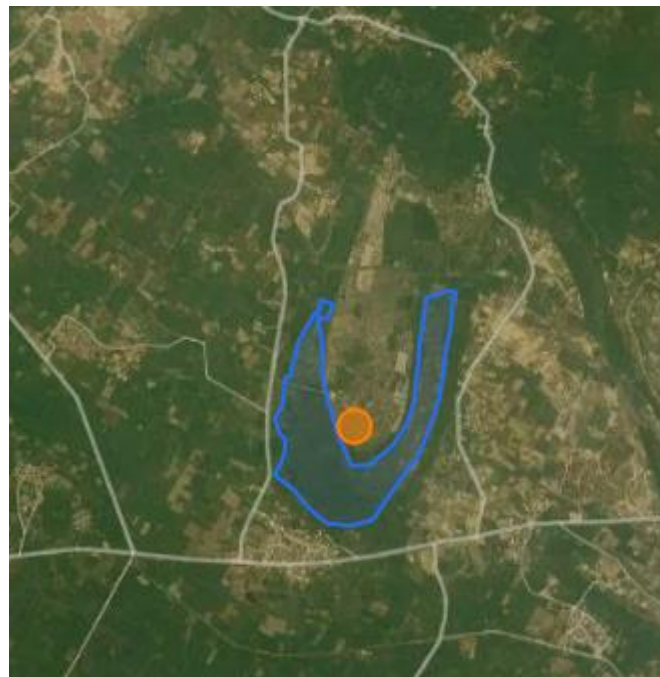
A jheel is typically an area of land that is completely saturated with water, whether all throughout the year or only during certain seasons. Because these areas of land are covered in water as well as a variety of different land and water dwelling plant life, they are well known to have rich and distinct ecosystems. As a direct result of this rich ecosystem, jheels are especially important to the world because they are the homes of most endangered wildlife and plant life in the world. Jheels are important to us as they remove pollution, recharge groundwater supplies, control floods, and provide home for variety of plants and animals. Jheels include swamps, marshes, bogs and fens. Jheels are lifelines of the society. They provide vital support to human well-being through their wide-ranging ecosystem services and biodiversity values. As these ecosystems degrade or are adversely altered, the water cycle, and the interlinked carbon and nutrient cycles are also adversely altered, leading to water, food and climate insecurity, and loss of biodiversity. Some of the major ecosystem services provided by jheels are Water storage, Support livelihoods by providing food, water and fiber; Regulation of water regimes and stream flows; Ground water recharge; Water purification; Nutrient recycling; Buffer shorelines from erosion; Buffer communities against floods, droughts, cyclones and wave surges; Support a

variety of life forms through extensive food webs; Habitat to diverse flora and fauna, including resident and migratory species; Habitat for migratory species such as water birds and fish; Provide recreational opportunities; Integral part of cultural identities; Enhance landscape aesthetics; and Stabilize local climate. The ability of a jheel to provide the aforementioned ecosystem services and support biodiversity is dependent on local conditions, geomorphic settings and linked livelihood systems.



Sauj jheel:-

Sauj jheel is spread in land of 40.7590 ha. It is situated adjoining to Saman Bird Sanctuary in Kishani Tahsil of district Mainpuri of Uttar Pradesh and surrounded by Sauj, Nagla Dude, Seha Sauj, Seha Kala and Samaan, Paharrpur villages. It is 32 km away from the Mainpuri city. It is seasonal jheel where rainy water collects every and stay from July to March. It is habitat of several bird species specially Sarus crane. Sauj jheel is surrounded by agricultural fields where rice is grown as major crop. Rice fields attracts lots of sarus crane. After harvesting the rice, Sarus crane needs an alternate habitat which can be provide by Sauj jheel.



Figur: .kml image of the jheel



Figure: Sauj jheel

Chapter 2

2.1 Survey, analysis of physical factors and human settlement

Location and extent

Sauj jheel is spread in land of 40.7590 ha. It is situated adjoining to Saman Bird Sanctuary in Kishani Tahsil of district Mainpuri of Uttar Pradesh and surrounded by Sauj, Nagla Dude, Seha Sauj, Seha Kala and Samaan, Paharrpur villages. It is 32 km away from the Mainpuri city.

It is about 3 Km away from Saman Bird Sanctuary, A Ramsar Site, of District Manipuri. The lake is surrounded by agricultural fields and human settlements.

Catchment& Ownership

The Sauj jheel Area Of Zone Of Influence is approximately 179.993 ha. Lake collectes rain wáter from the surrounding. The lake's ownership is belong to Gram Panchayat and manage by Village Wetland Committee, under

Supervision of District Wetland Committee Office Of District Magistrate Mainpuri, Uttar Pradesh,

Altitude-The Average altitude of the jheel 150.0 m. above MSL.

Geology, Rock and soil

Geology- The Tract is drained by the rivers Jamuna and Chambal. Topography is Almost flat with depression in the lake area. The entire formation consists of genetic alluvium with kanka layers,

Soil- The top soil course, angular sand with small clay fraction and crumb structure. Soil is slightly alkaline to saline.

Climate- Climate is dry and of an extreme type, characteristic of southern and southern-western Uttar Pradesh. Three distinct seasons, summer very hot marked with a high velocity hot wind (Locally known as Loo) During April and May, rains about 650mm, during July and October, and a normal winter.

Temperature- Maximum temperature: 46°-48⁰, minimum temperature 4°-5°.

Land use patterns in the catchment: -

Limits and boundaries of jheel catchment: -

The Catchment of Sauj Jheel comprises a zig-zag area. Jheels are considered as most productive zone and have high degree and susceptibility to change. With the increasing human population lake is being converted gradually into agricultural fields. Lake and its surrounding are being used for the following purposes: -

1. Crop cultivation.
2. Cattle grazing ground.

3. Fishing.

Most of the lake area remains water logged and inundated during monsoon under 1-5 feet deep water. Paddy crop is cultivated where depth is shallow and Trapa where lake is somewhat deeper. Whole of the water body is covered with Trap plants. After September water starts receding, farmers grow wheat, and other water Rat crops in the area:

In catchments are, paddy and millet cultivation is quite common during Rabi crop and wheat during Kharif Crop.

Human Settlement –

There are five nearby villages, which are dependent for one or the other purpose on the lake. Land use involves crop-cultivation, fisheries, Trapa cultivation the demographic data of these villages are as under: -

S.N.	Name of Village	Population
1	2	3
1	Sauj	9500
2	Nagal Dude	2500
3	Seha Sauj	3000
4	Seha Kala	3000
5	samaan	4000
	Total	22000

Small number of villagers as per details given below is also engaged in other professions, like services, fishing and cash crop cultivation.

Agriculture- Agriculture is the main source of their livelihood. Rabi and Kharif, both the crops are given using canal irrigation facility. Paddy, wheat, barley, millets, and potato are the main crops.

Water capacity of Sauj Jheel and source of inflow and outflow of water.

Inflow: -

The lake receives most of its water from monsoon rains but sometimes nearby Canal. A minor branch of the Lower Ganga Canal due to overflow during irrigation.

Outflow

Water outflows from the lake in the near by agricultural fields. But during summer, lake remains dry when birds like sarus cranes need water, Here hundreds of sarus congregate during summer for pairing purposes.

Biodiversity in the Jheel:-

Animals found around the jheel are follows:

Invertebrates –Some of the main spp. Of invertebrates are as euglena, paramecium, earthworm, lichens, water floacrab, centlpedes, millipedes, spider, scorpion, cockroach, praying mantis, grasshopper, honey bee, wood ants. Red ants, giant bug, termite, dragon fly, water scorpion, beetle lady bird, fire fly hornet, mud wasp, different spp. of butterflies like kaiser hind great zebra, blue bottle, common mine, glossy tiger, common tiger ,plain sulphur, tree yellow, grass yellow, tiger brown.

Fishes:-Katla, Rohu, Main, Singhi,Patra,Taingani.

Reptiles:-Turtels: Indian soft shelled turtle,Indian flap shelled turtle,spotted pond turtle.

Snakes:- Common krait,Russel viper,Russell,Sand boa, Redsand boa, Rat snake, Wls snake,python Cobra,Dhaman.

Lizards :-Gargess lizard, Common Indian monitor.

Flora of Jheel:

Terminalia arjuna, *Syzygium cumini*, *Azadirachta indica*, *Calotropis procera*, *Drimys indica*, *Typha elephantina*, *Cannabis sativa*, , *Capparis zeylanica*, *Ichocarpus fruticosa*, *Vitis repanda*, *Zizyphus oenoplia* mill, *Samanea indica*, *Asparagus racemosus* wild, *Saccharum spontaneum*, *Chrysopogon fluvus*, *Vetiveria zizanioides*, *Desmostachya bipinnata*, *Cynodon dactylon*, *Saccharum mung*, *Nelumbo nucifera*, *Ipomoea aquatica*, *Eichhornia*.

Avifauna-

Marbel teal, common teal, gray leg goose, coot, painted stork, pintail, snipe, teal, bareheaded goose, Whistling teal, bronze jacana, wagtail, night heron, Indian reef heron, open bill stork, white necked stork, black necked stork, flamingo, avocet, comb duck, Common pochard,

Blue rock pigeon, pied crested cuckoo, crow pheasant, great horned owl, green bee eater, house, swift, pied kingfisher, common kingfisher, white breasted kingfisher, swallow, brahminy myna, pied myna, common myna, bank mayna, house crow, jungle crow, red vented bulbul, white checked bulbul, tree pie, purple sun bird, house sparrow, red munia, blue throat, pond heron, hawk tawny eagle, great spotted eagle, crested hawk eagle, booted hawk eagle, rain quail, jungle bush quail, black partridge, gray partridge, common peafowl-water hens, purple moorhen, jacanas, green imperial pigeon, Sarus cranes, cormorants, darters, purple heron, gray heron, egrets, black ibis, glossy ibis, spoon bills, white ibis, Indian river tern, common sand piper, common babbler.

2.2 To Make a detailed plan to check the soil erosion in catchment areas and increase water availability in the jheel

The Sauj jheel is located in low altitude area as compared to surrounding. So, during the rainy season a large amount of water is gathered in lake. This runoff water from surrounding comes with a lot of silt from cultivated and non-cultivated land, resulting in low accumulation of water in the lake. A study was done in the catchment area and concluded that plantation of *Prosopis juliflora* and grass in non-cultivated land will be beneficial to check the erosion. Secondly, encouragement and free distribution of saplings to the villagers of catchment area will help to check the soil erosion.

2.3. Improve the habitat, nesting and roosting sites for the *Sarus crane*

Sarus crane is basically a jheel bird and commonly seen in marshland, paddy field, non-cultivated agricultural field, marshlands, potato, lentil, mustard and wheat fields where they feed on insects, snails, grains, tubers etc. They spend a long hour of the day in feeding. During night time, they rest on agricultural field and marshland. During night time, they do not allow coming close and also produce loud calls if approached. In the field, for the rest, Sarus cranes stand on one leg. Sarus cranes make calls during courtship and also while feeding in a flock. When a flock of Sarus feeds in a marshland and agricultural field and other Saruses are passing in flight over this group, both the flock give a note call to each other. They spend more time in feeding during summer because the water sources get dry and food availability is less.

We recorded different sized nests. The nest diameter and height of nesting were also recorded. The height of nests from water surface was recorded along with the diameter. The average nest diameter was 155-165 cm, whereas average nest height was 28-32 cm. The major portion of the nest material was *Oryza sativa* (Paddy straw), *Cynodon dactylon* (Doob grass), *Impomea aquatica*, *Cyprus rotundus* etc.



So it was suggested that supplement of water is needed from canal or other source in the summer season since Sauj lake has only

seasonal source of water. It is also suggested to keep the nesting raw material of at several places so that Sarus can easily get nesting material.

Chapter -3

3. Evaluation of the major threats of jheels :--

3.1 EVALUATION

Sauj lake is located near the Saman Bird sanctuary which is recognized as Ramsar site. So it is important jheel which can provide additional habitat for the migratory birds who visit the saman bird sanctuary during the winter. The majority of the migratory birds are jheel dependent. Thus, the availability of water is the most important feature that needs to be planned. The area has witnessed a marked variation in the rainfall pattern and the amount of runoff reaching the jheel. Hence, artificial supplementation of water to the lake needs to be resorted to as and when necessary.

The habitat quality is also a function of clear water spread area, the amount of silt reaching into the lake, the water holding capacity of the lake, the availability of the food for the birds, the extent of weed infestation and availability roosting and nesting sites etc. All these factors have been considered while prescribing activities to achieve the desired objective.

3.2 THREATS

The Jheel is surrounded by the populated area and there is a great biotic pressure from the human and cattle population. These villagers have no pasture land. Many people of the surrounding villages were depending on the Sauj lake for grazing, fishing, collection of fuel wood. Overall control of the Jheel is affected by lack of Co-operation between different department and political pressure Of vested interests' groups and the local land holder.

A. Grazing Activities:-

Grazing activities leads to habitat destruction, cattle destroys the nesting grounds, eggs, and chicks of migratory water birds. Heavy hooves compact muddy soils, reducing water infiltration and triggering severe shoreline erosion leads to Soil Degradation. Animal waste introduces excess nitrogen and phosphorus, driving eutrophication and toxic algal blooms results in water pollution. Domestic herds outcompete native wild herbivores for limited vegetation, forcing wild animals out of their natural habitats. Heavy Grazing result in stripping shoreline vegetation leaves soil bare, letting rain wash sediment into the water and rapidly shallowing the basin.

B. Catching Fish:-

High demand and poor regulation reduce fish variety and numbers. Practice of using fine nets catch fish eggs and tiny fishlings, harming future populations. Nets accidentally trap and kill water birds, turtles, and other animals. Pollution, shrinking water areas, disrupt fish migration and breeding not only result in loss of livelihood of local people but also food availability for the water birds.

C. Encroachment:-

Encroachment is a major threat due to increasing population. Lake bed is being converted into agriculture fields, hence its area is shrinking continuously every year.

D. Denudation of catchment areas leading to siltation:-

Soil erosion in catchment areas and siltation is a real threat to the perpetual existence of the jheel. While the rate of saltation has yet not been quantified, it is quite possible that this is serve.

E. Prolific growth of noxious aquatic word: –

Large areas of jheel are under threat of specific weeds

F. Electrification:-

Open electrification of the high voltage line is major threat to the sarus crane in the sau jheel. Sarus crane takes low flight and get stuck to the wire cause several death every year.



G. Lack of Legal Status:-

As the jheel has not been notified yet by any legal body. The use of jheel to other forms of land is major threat.

H. Decrease in biological diversity:-

As very little baseline data exist from the time before jheel deterioration started, it is difficult to exactly define the quantitation or qualitative decrease in biological diversity.

The species of endemic and indigenous flora that have been perceived to have significantly reduced are crabs (*Carcinus* spp) raptors and vultures. The disappearance of vultures and raptors is of course a country wide phenomenon and cannot be considered as a localized phenomenon concerning the jheel exclusively.

I. Deterioration in water quality:-

There have been no proper studies on the water quality of the jheel. Although there are no direct discharges of industrial or urban effluents into the jheel, it is logical to assume that pollution of the jheel is increasing with the increased use of agriculture pesticides and fertilizers in the catchment. The quantities of these substances reaching the jheel through all possible pathways will either increase the BOD, and COD or if pollutant are non-biodegradable or stable compounds with very long half-life they will accumulate in the jheel ecosystem. Jheel possess considerable ability of ameliorating the harmful effects of pollution by processing and cycling of pollutants and the exact status of pollution of the jheel can be determined only after considerable study of the various phenomenon involved .

Presently various chemicals such as general insecticides , DDT, Aldrin, various herbicides, fungicides, methyl-mercury compounds and rodenticides are believed to be in use in the jheel catchment for control of various forms of agriculture and insect pests. In addition, various forms of organic fertilizers such as urea are in use, which may upset the nutrient balance of the jheel and encourage weed proliferation.

J. Decrease in the Population of Resident and Migratory birds:-

The necessary baseline data to exactly quantify the decrease in the population of either resident or migratory birds or even assess the loss in species diversity does not exist, so it is not possible to precisely assess the decrease in the populations or diversity of migratory birds . However there is an apparent downwards trend in the arrivals of certain conspicuous species, such as sarus crane and geese , and it may be assumed that , such reduction has occurred with many other species as well.

Chapter 4

Brief Approaches to be adopted to conserve Sauj jheel

1. **Survey/ Demarcation** – After survey area of lake will be demarcated. Earthen bund around the lake, adjoining forest area will also be taken and plantation in other departmental schemes.
2. **Afforestation/ Raising of Nurseries:-** A part from plantation activities of forest land afforestation on agricultural land on bunds and other vacant land will be encouraged Saplings will also be distributed among local villagers for planting in their fields and houses.
3. **Weed Control** – Water hyacinth is obnoxious weed. Continuous preventing measures will be taken the lake free from weeds.
4. **Soil Conservation Measures:-** Vegetative cover will be developed adjoining forest and local areas in catchments of Sauj Lake. All round lake area is flat and remains submerged during the monsoon.
5. **Wildlife Conservation:** - The seeds of fishes of local species, if required, will be propagated into the water body and their requirement of food will be ensured. Technical guidance regarding species will be taken from Fisheries Department of U.P. Government.
6. **Control of Pollution:-**
 - (i) To discourage use of polythene made materials.
 - (ii) To enhance use of bio- fertilizers and bio- insecticides/ Pesticides.
 - (iii) To solicit people's participation for conserving the existing trees increasing vegetation over by afforestation.
7. **Environmental Awareness:-**

To create awareness among the people of villages adjoining the project area importance of jheel and their role in the existence and betterment of local community, importance of flora and fauna will be done through person contact, public meetings, pamphlets, posters and audio- visuals programmers.
8. **Health Camp:-**

Health Camp will be the organized for domestic cattle and local people to improve their health which will ultimately improve the economics of Local people living around the jheel.

Chapter 5

Institutional arrangements

5.1 REVIEW OF EXISTING ARRANGEMENTS

The Jheel has not been notified as protected area under the any existing Act so far, so department has limited power to regulate the anthropogenic activities. At the local level, it is headed by Gram Panchayat which comes under the Jurisdiction of Revenue department. Range Forest Officer, Kishni range is main custodian of wildlife in the lake who works under the supervision of the Director social forestry division Mainpuri. Thus forest department is the main government organ responsible for protection and management of this jheel.

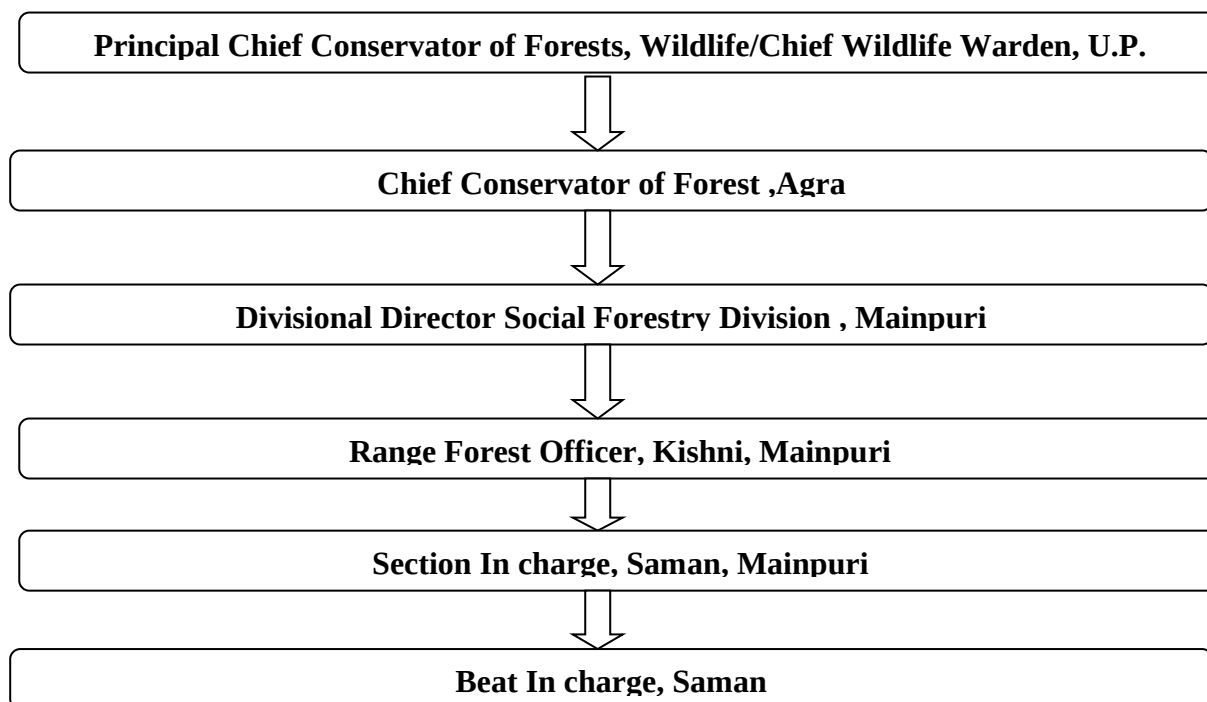
Importance of cultural heritage, indigenous knowledge, local practices by local people and role of civil societies cannot be underestimated. The civil societies help to aware the people about the importance of jheel. Local people play a key role in providing the information about the poachers.

5.2 GAPS

Sauj lake is not notified and falls under the jurisdiction of revenue department so department has limited legal authorities to control the activities in the area.

5.3 PROPOSED ARRANGEMENTS FOR JHEEL MANAGEMENT

The present arrangement is effective and adequate and the same will be continued.



Chapter 6

Setting management objectives

6.1 GOAL AND PURPOSE

The goal of this management plan is “The long term conservation of Sauj Jheel for posterity and the maintenance of the ecological process and functions supported by it for the benefit of nation and the humanity.”

The Sauj jheel is the maser habitat of the Sarus crane which is declared as state bird of the Uttar Pradesh. So the long term aim is to be free this area from anthropogenic pressure. It is also aimed to ensure the local people participation in the conservation of jheel.

6.2 BENEFITS

The benefits that will accrue due to wise management of the jheel is a habitat that would support thousands of migratory species of aquatic birds which flock the region during severe winters. The jheel supports wide variety of flora both terrestrial and aquatic which play a huge role as producers in the complex food web of the jheel ecosystem. The jheel serves a great role in the region by providing provisioning, regulating, supporting and recreational services like buffering communities from extreme events as floods and storms, groundwater recharge, acts as a sink for sediments, has significant cultural and religious values. If the ecosystem is managed efficiently with effective eco-tourism strategy it would also provide livelihood opportunities for the villagers living in and around the sanctuary.

6.3 MANAGEMENT OBJECTIVES

- (i) Protection and conservation of natural habitat of avifauna in particular of Indian Sarus Crane.
- (ii) Restoration of Sarus habitat and bio-diversity of Sauj Jheel.
- (iii) To create awareness among people regarding the potentials of Sauj Jheel .
- (iv) To associate local villagers in conservation of bio-diversity.
- (v) To create interpretation centre for people where people can learn about wildlife and bio-diversity through audio-visual technology.

6. 4 Strategies -

To achieve the above objectives following measures are suggested:-

- (i) Survey , delineation and bunding of lake to avoid encroachment of lands in future.
- (ii) To make the people know about the adverse effect of use of chemicals and pesticides for crops.
- (iii) To create awareness about the status of avi-fauna in particular about Sarus Crane.
- (iv) Training awareness programme for staff and local people regarding jheel management and eco-development.

- (v) Construction of a watch tower to facilities bird watchers to have effects vigil on the area and also to study flora and fauna.
- (vi) Necessary equipment's for bird watching and management activities.
- (vii) Extension activities people's training, awareness, nature camp, publication of brochures, etc.

6.4.1 Jheel Management –

Following works will be taken up to improve the habitat with aim to facilitate migratory birds and other fauna and flora of the area.

- (i) Raising of suitable indigenous plant species around the area that can provide shelter and food for avian fauna.
- (ii) Deepening of the lake to ensure the availability of water throughout the year to facilitate aquatic fauna.
- (iii) Removal of weeds , like water hyacinth, etc.
- (iv) Construction of small earthen islands inside the lake to provide nesting and roosting grounds for birds.

6.4.2 Restoration Measures:-

Adopting following activities, restoration of the jheel can be done-

- (i) Removal of slit through depending of the lake.
- (ii) Removal of weeds , like water hyacinth, etc.
- (iii) Promoting vegetative cover in the catchment area.
- (iv) Strict vigil on poaching of the birds.
- (v) To discourage trapa cultivation.
- (vi) Supplementing fish population in the lake by adding local fish seeds increase food availability for avian fauna.

6.4.3 Hydrological Measures:-

- (i) To make economical use of water.
- (ii) Construction of outlet regulator of the drain to ensure eater availability the lake.
- (iii) To supplement lake water through irrigation net –work.

6.4.4 Socio- Economic Development through community participation-

After consultation and making villagers aware of the benefit of the project. It will be implemented. During the project period sufficient employment will be generated which will improve socio-economic condition of the people.

6.4.5 Public Awareness and Education-

Construction of interpretation Centre near the lake in which proper and scientific information will be available. All the villagers in the vicinity of the water body will be made aware and trained regarding environmental pollution biodiversity, aquatic and avi-fauna, water conservation, etc. by means o training, posters, pamphlets, etc. through local NGOs/ CBOs.

6.4.6 Legislative and Administration Measures:-

In case of any adversity, offence, etc. action under Wild Life Protection Act, 1972 will be taken. Administration staff present in that area will also be motivated and trained to become people friendly and wildlife oriented.

Chapter- 7
Developing an action plan

7.1 COMPONENT WISE ACTIVITIES LINKED WITH MANAGEMENT OBJECTIVES

All the activities being prescribed for the next 05 years are listed in the table below:-

Management Plan Component	Activity	Location
Catchment area	Plantation of 8-12 feet plants	Catchment Area
	Maintenance of the Nallahs	Catchment Area
	Construction of earthen bund around the jheel	Catchment Area
	Computer operator remuneration	Catchment Area
Protection	Day and night Patrolling of Sauj Jheel watchmen.	Sauj Jheel
	Patrolling in the jheel by boat	Sauj Jheel
Extension and Publicity / Livelihood Development and Other	Construction of new boards,banners, pamphlets, hoardings, maintenance of old boards for the awareness of local people and visitors and purchasing books, binoculars, small search lights etc.	Sauj Jheel
	Public awareness camp (one day)	Sauj Jheel
	Nature Camp (One Day)	Sauj Jheel
	Health Camp for Domestic Cattle (For local people)	Sauj Jheel
	Human Health Camp (for people living around Jheel)	Sauj Jheel
	Educational excursion program for the local people	Sauj Jheel
	Staff training program	Sauj Jheel
	Wildlife Week celebration	Sauj Jheel
	Reward for the informer for effective prevention of poaching	Sauj Jheel
Habitat Restoration Measures	De-siltation work to in the jheel (by mechanical method)	Sauj Jheel
	Expenditure on removal of soil dug by de-siltation from every distance of more than 30 m (additional lead of 30 m)	Sauj Jheel
	Making of earthen bund around jheel	Sauj Jheel
	Removal of harmful weeds	Sauj Jheel
	Maintenance old island	Sauj Jheel
	Birds census	Sauj Jheel
	Construction of dykes with gate to control the water flow form the lake as per water log condition	Sauj Jheel
	Construction of breeding and nesting sides for sarus crane	Sauj Jheel
	Releasing suitable species of fish seed / turtle	Sauj Jheel

Ecotourism Development	Land Scaping	Sauj Jheel
	Childern park	Sauj Jheel
	Public toilets	Sauj Jheel
	Staff room	Sauj Jheel
	Dustbins	Sauj Jheel
	Fencing	Sauj Jheel