# DISTRICT ENVIRONMENT PLAN

# FOR

# DISTRICT KANGRA

# IN

# HIMACHAL PRADESH

# INDEX

# FOREWORD

Hon'ble National Green Tribunal, New Delhi has passed an order on 15-07-2019 in O.A. No. 710/2017 titled as Shailesh Singh Versus Sheela Hospital and Trauma Centre Shahjahanpur that it is necessary to have a District Environment Plan to be operated by the District Committee.

District Environment Plan in respect of District Kangra covers 7 thematic areas (Waste Management Plan, Water Quality Management Plan, Domestic Sewage Management Plan, Industrial Waste Water Management Plan, Air Quality Management Plan, Mining Activity Management Plan and Noise Pollution Management Plan by capturing basic information on 64 action areas.

District Environment Plan is of immense importance as to involve community participation. It should delineate the mitigation measures, monitoring and evaluation plans, citing specific roles and responsibilities of key personnel, so as to minimize the adverse effects of the human activities to the environment.

# DISTRICT KANGRA AT A GLANCE

## Location

Kangra district lies between 31˚ 21′ to 32˚ 59′ N latitude and 75˚ 47′ 55″ to 77˚ 45′ E longitude. It is situated on the southern **escarpment** of the Himalayas. The entire area of the district is traversed by varying altitude of the Shivaliks, Dhauladhar and the Himalayas from North-West to South-East. The altitude varies from 500 metres above mean sea level (msl) to around 5000 metres above msl. The present Kangra district came into existence on the 1st September, 1972 consequent upon the re-organisation of districts by the Government of Himachal Pradesh. It was the largest district of the composite Punjab in terms of area till it was transferred to Himachal Pradesh on 1st November, 1966 and had six tehsils namely Nurpur, Kangra, Palampur, Dehragopipur, Hamirpur and Una.

Kangra district derives its name from Kangra town that was known as Nagarkot in ancient times. Kangra originally was a part of the ancient Trigarta (Jullundur), which comprises of the area lying between the river "Shatadroo" (probably Sutlej) and Ravi. A tract of land to the east of Sutlej that probably is the area of Sirhind in Punjab also formed a part of Trigrata. Trigrata had two provinces. One in the plains with headquarters at Jullundur and other in the hills with headquarters at Nagarkot (Present Kangra).

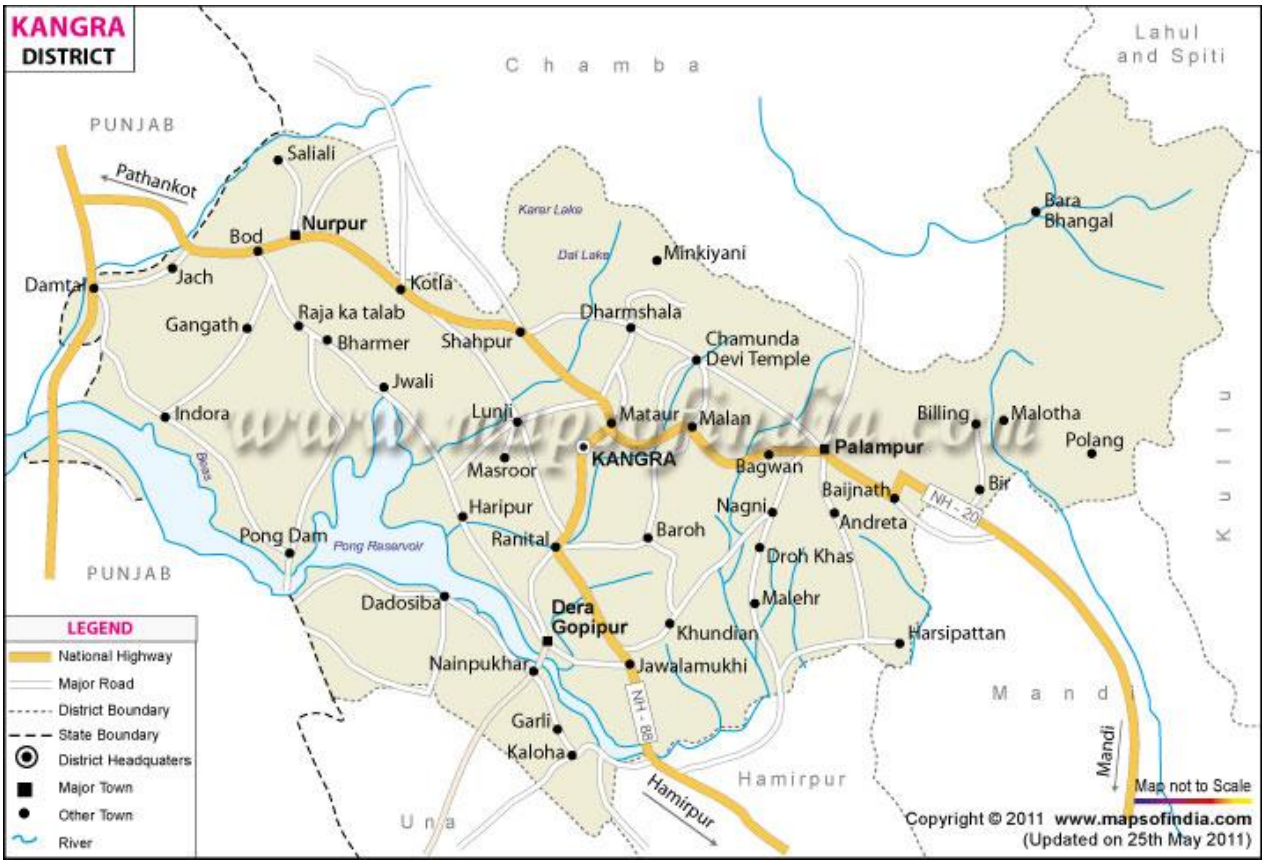
## Boundaries

It is encapsulated in the north by the districts of Chamba and Lahaul and Spiti, in the south by Hamirpur and Una, in the east by Mandi and in the west by Gurdaspur district of Punjab.

## Demography

| | |
|---|---|
| Total Population | 1,510,075 |
| Male Population | 750,591 |
| Female Population | 759,484 |
| Literacy Rate | 85.67% |

As per Census of India 2011




**Administrative Set up**

| | |
|---|---|
| Sub Division | **14 Number** (Kangra, Dharamshala, Nurpur, Dehra, Jaisinghpur, Palampur, Baijnath, Jawali, Jawalamukhi, Fatehpur, Shahpur, NagrotaBagwan, Dheera and Indora) |
| Tehsils | **22 Number** (Kangra, Nurpur, Jawali, Indora, Dehra, Shahpur,Baroh, Khundian, Jaswan, Rakkar, Harchakian, Fatehpur, Baijnath, Dheera, Jaisinghpur, Thural, Dharamshala, Multhan, Palampur, Jawalamukhi, NagrotaBagwan and Dadasiba,) |
| Sub Tehsils | **12 Number** (NagrotaSurian, Kotla, Gangath, Haripur, Panchrukhi, Chadhiyar, Alampur, Darini, Majheen, Bhawarna, Lugru and Pragpur) |
| Development Blocks | **15 Number** (Kangra, NagrotaBagwan, Rait, Baijnath, Dehra, Bhawarna, Fatehpur, Indora, Lambagaon, Nurpur, Panchrukhi, Sulah, Pragpur, NagrotaSurian and Dharamshala) |
| Panchayats | 748 |
| Villages | 3908 |

**Land Use Pattern**

| | |
|---|---|
| Total Geographical Area | 5,77,681 hectare |
| Area Under Forest | 1,80,541 hectare |
| Total Cultivated Area | 1,95,738 hectare |
| Net irrigated Area | 33,528 hectares |
| Area Sown more than once | 97,535 hectare |

**Climate and Rain Fall**

The Kangra lies on 706m above sea level. The climate of Kangra is classified as warm and temperate. The summers are much rainier than the winters in Kangra. In Kangra, the average annual temperature is 21.8 °C and the average annual rainfall is 2500 mm.

| Sr. No | Season | Period | Type | Other Features |
|---|---|---|---|---|
| 1 | Cold Weather or Winter Season | Mid November to Mid March | Cold and Dry | From Mid February to March the season is called the spring season |
| 2 | Hot Weather or Summer Season | April to June | Hot and Dry | -- |
| 3 | SW Monsoon OR Rainy Season | July Mid September | Humid and Hot | -- |
| 4 | The seasons of retreading monsoon or Cool season | Mid September to Mid November | Moderately Hot and Humid | From Mid September to October the season is called Autumn season, which is very pleasant |

# INTRODUCTION

Environment is the complex of biotic and abiotic factors that act upon an organism or on ecological community and ultimately determine its form and survival. Literally, environment means all that which surrounds us.

Biotic components or factors can be described as any living component that affects another organism or shapes the ecosystem.

Abiotic factors are non-living chemical and physical parts of the environment that affect living organisms and the functioning of the ecosystems.

The Earth Science generally recognizes four spheres, the Lithosphere, the Hydrosphere, the Atmosphere and the Biosphere as correspondent to Rocks/ Earth's Crust, Water, Air and Life respectively.

The world environment is going too much worst day by day as one use our natural resources indiscriminately and fail to manage our waste. Our total environmental condition deteriorate in everyday life but we yet not concern ourselves for saving us from different types of natural calamities and extinction of several types of species. It is true that only human are responsible for polluting environment, but if we have a little bit concern that it will make us positive thinker to save our environment.

**CURRENT SITUTAION OF ENVIRONMENT:**

Due to over exploitation of the natural resources, the situation of environment is so poor that could never be imagined by our old generations in previous time. This has led to various types of pollution i.e. Air, Water, Soil and Noise Pollution. Settlements are the main reasons of increasing pollution which have resulted in various diseases and hampered the quality of life.

**SOLUTIONS FOR SAVING ENVIRONMENT:**

Solutions are many but all need proper action and support from all groups of people. Forests are the key operators of natural cycle but due to over exploitation we have forgotten its importance. Thus the first step to save our environment is to plant trees as more as possible. The next is the use of FIVE R's while using our natural resources. They are:

**REDUCE, RECYCLE, REUSE, REFUSE and REPURPOSE:**

The other measures are use of CNG Vehicles, proper implementation of bylaws of environment protection etc.

**ECOSYSTEM-A PART OF ENVIRONMENT:**

An ecosystem is a community of living organisms in conjunction with the non-living components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles. Energy enters the system through photosynthesis and

is incorporated into plant tissue. By feeding on plants and on one another, an animal plays an important role in the movement of matter and energy through the system. They also influence the quantity of plant and microbial biomass present. By breaking down dead organic matter, decomposers release carbon back to the atmosphere and facilitate nutrient cycling by converting nutrient stored in dead biomass back to a form that can be readily used by plants and other microbes.

Ecosystems are controlled by external and internal factors. External factors such as climate, soil and topography, control the overall structure of an eco-system but are not themselves influenced by the eco system. Unlike external factors, internal factors are controlled, e.g. decomposition, root competition, shading, disturbance, succession, and types of species present.

Ecosystems are dynamic entities. They are subject to periodic disturbances and are in the process of recovering from some past disturbance. When a perturbation occurs an eco-system responds by moving away from its initial state. The tendency of an eco-system is to remain close to its equilibrium state, despite that disturbance if any is countered as its resistance. On the other hand the speed with which it returns to its initial stage after disturbance is called its resilience. Time plays a role in the development of rock from bare soil and the recovery of a community from disturbance.

**POLLUTION:**

The word 'POLLUTION' has been derived from the Latin word 'POLLUTIONEM' which means defilement. Pollution is an undesirable change in physical, chemical or biological characteristics of air, water and land. That may or will adversely affect human life and other life forms. Various types of pollution are caused but mainly the following lead to life threatening and adverse effects to humans in general.

**Air Pollution**- It is caused by the occurrence of foreign particles (Aerosols or SPM) or gases in the atmosphere. It is caused by vehicular emission, dust from Katcha Roads and paths, burning of agriculture wastes, burning of fuels and release of hazardous gases from industries.

**Water Pollution**– It is the addition of some substances (Organic, Inorganic, Biological or Radiological) or factor (Heat, pH) which degrades the quality of water so that it either become health hazard or unfit for use.

Water pollution is caused by sewage discharge dumping of municipal/solid waste, biomedical waste, E-waste, C & D waste etc.

**Noise Pollution**–Increase in noise level leads to noise pollution. Noise is defined as unpleasant sound that has an adverse effect on the human. Major causes are the honking of moving vehicles, DJ at Marriage ceremonies and loud music at religious places, running of machines at sites, radios, TVs etc.

**Soil Pollution**–Soil contamination or soil pollution as part of land degradation is caused by the presence of Xenobiotic (Human-made) chemicals or other alteration in the natural soil

environments. It is typically caused by industrial activity, agriculture chemicals and improper disposal of waste.

**Environmental Management:**

There are two main approaches for environmental management.

1. Management based on standards.
2. Management based on best practicable means.

The first approach requires statutory provisions of standards for each pollutant for air, water, noise and soil. In this approach, each polluter could choose a suitable technique for pollution control, based on their evaluation for technical feasibility and economic viability.

The second approach is based on best practicable means. In this case the industry is free to adopt any suitable method which is technically feasible as well as economically viable.

**Polluter Pays Principle (PPP):**

The 'Polluter Pays Principle' is the common accepted practice that those who cause pollution should bear the cost of managing it to prevent damage to human health or environment. This principle underpins most of the regulation of pollution affecting land, water and air.

# OUTCOME OF INVENTORIES

As per the thematic areas suggested through modal DEP prepared by CPCB the following analysis was done.

In District Kangra there is one Municipal Corporation, six Municipal Councils and one NAC as below:

| Sr. No. | NAME OF MC/NAC | REMARKS |
|---|---|---|
| 1 | Dharamshala | Municipal Corporation |
| 2 | Jawalamukhi | Municipal Council |
| 3 | NagrotaBagwan | Municipal Council |
| 4 | Palampur | Municipal Council |
| 5 | Dehra | Municipal Council |
| 6 | Kangra | Municipal Council |
| 7 | Nurpur | Municipal Council |
| 8 | Baijnath-Paprola | NAC |
| 9 | Jawali | Nagar Panchayat |

The Ministry of Environment, Forest & Climate Change, Govt. of India has notified SWM Rules 2016. As per the rules, the role of local body has been specified in rule 15 of SWM, 2016 (Duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations) and as per rule 16 of the said rules, HPSPCB shall enforce the rules through local bodies.

# 1. WASTE MANAGEMENT PLAN

## a) SOLID WASTE MANAGEMENT

The following Action Areas have positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Segregation of Waste | Partially |
| 2 | Door to Door Collection | Partially |
| 3 | Linkage with Recyclers | Initiated |
| 4 | Authorization of Waste Pickers | Initiated |
| 5 | Issuance of ID Cards | Initiated |
| 6 | Composting of Wet Waste | Partially |

The following action areas have to be improved or they have to be included in the future action plans:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Mechanical Road Sweeping | Not Initiated |
| 2 | Bio-Methanation | Not Initiated |
| 3 | Use of Sanitary Landfills | Not Initiated |
| 4 | RDF (Refused Derived Fuel) | Not Initiated |

## SWM in RURAL AREAS:

**Part A:** Rural Areas without Industries

**Part B**: Rural Areas with Industries and having mining activities

In rural areas generally the waste material is Kitchen Waste, Agriculture Waste and domestic animals dung. All these waste materials are being used for making manure (Local composting) by the farmers.

In rural areas having industries and mining activities there is problem of Solid Waste Management. As these areas are densely populated and there is no mechanism by the local bodies for their segregation and disposal in a scientific way. This area needs improvement.

As per new Solid waste Management Rules, 2016, Municipal Authorities are responsible for the implementation of the provisions of these rules, for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid

wastes. Un-segregated waste reaching the composting yard is the main reason for this failure. The waste is processed by the **unskilled manpower** thus resulting into production of contaminated compost as well as degradation of recipient environment. The performance of all the existing facilities is **not much satisfactory.** The remaining municipal authorities dispose off/dumped the untreated / unsegregated waste collected from the respective areas at dumping sites.

## b) PLASTIC WASTE MANAGEMENT (PWM) :

Plastic waste is a global concern. Plastic products have become an integral part of our daily life. Once Plastic is discarded after its utility is over, it is known as Plastic Waste.

In terms of PWM, the following action areas have positive outcomes in r/o ULB's in Distt. Kangra:

| Sr. No. | ACTION AREAS | OUTCOMES |
|---|---|---|
| 1. | Door to door collection | Partially |
| 2. | Prohibiting Sale of Carry Bags Less than 50 micron of thickness | 100% |
| 3. | Ban on Single Use Plastic | Implemented |

The following action areas have to be improved or to be included in the action plan for PWM:

| Sr. No. | ACTION AREAS | OUTCOMES |
|---|---|---|
| 1. | Authorization of PW Pickers | Not Initiated |
| 2. | PW Collection Centers | Not Initiated |
| 3. | Linkage with NGO's | Not initiated |
| 4. | Use of Poly waste | Needs Improvement |

**PWM in Rural Areas:**

In Rural areas of Distt. Kangra there are no collection centers for Plastic collection, this problem is causing a threat in present and for future.

Only PW Pickers/ Garbage Collector/Kabadi are collecting the Plastic Waste from Local people.

## c) C&D (Construction and Demolition) Waste Management in r/o ULB's in Distt. Kangra

It consists of unwanted material produced directly or incidentally by the construction. It may also *contain hazardous* substances. In terms of CDWM, the following action areas have positive outcomes:

| S.N. | Action Areas | Outcome |
|---|---|---|
| 1. | Issuance of Permission by ULB's | Initiated |
| 2. | CD Deposition Points | Initiated |

So the following Action Areas needs improvement:

| S.N. | Action Areas | Outcome |
|---|---|---|
| 1. | CD waste Recycling Plant | Not Initiated |

### CDWM in Rural Areas

There is no mechanism for CDWM in Rural Areas of Distt. Kangra. There are no designated dumping sites for construction and demolition (C&D) waste. Sometimes empty cement bags are reused for making Dangas/Retaining Wall by filling debris.

## d) BIOMEDICAL WASTE MANAGEMENT (BWM)

The MOE &F& CC, GOI vide notification GIR -343(E) dated 26-03-2016 has notified Biomedical Waste Management rules 2016. For the collection, transportation and disposal of Biomedical Waste Treatment facilities (Suraksha Bio-Sanitizer) at Dhugiari has disposal/ incineration capacity of 50 Kg. / hour catering to Biomedical Waste of Health Care Facilities (HCF) of Distt. Kangra. The following Action Areas have positive outcomes:

In terms of BMWM the Distt. Kangra has following positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Linkage with CBMWTFs | Partially |
| 2 | Compliance to Standards | Partially |
| 3 | Barcode tracking by HCFs | Partially |

The following action areas in terms of BMWM are lacking:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Linkage of private HCF with CBMWTF's | Initiated |
| 2 | Daily carriage of BMW | Initiated |

## e) HAZARDOUS WASTE MANAGEMENT (HWM)

It involves treating hazardous wastes to reduce their toxicity and reducing the amount of hazardous substances from the waste, and applying methods to reduce or eliminate exposures to these wastes.

In terms of HWM the following are positive outcomes:

| **Sr. No.** | **Action Areas** | Outcome |
|---|---|---|
| 1 | Industries Linked with TSDF | All the hazardous waste generating industries in District Kangra have been linked to authorized facility i.e. M/s Shivalik Solid Waste Management Ltd, Nalagarh, Surya Oil Traders, Baddi, etc. |

The following action areas have positive outcomes:

| **Sr. No.** | **Action Areas** | Outcome |
|---|---|---|
| 1 | Illegal Transport and Dumping of HW | No illegal transport and dumping of Hazardous Waste is allowed. The whole hazardous waste is being transported through authorized vehicles of authorized facility i.e. M/s Shivalik Solid Waste Management Ltd, Nalagarh, Surya Oil Traders, Baddi etc. HPSPCB is keeping strict vigil in the area. |

## f) E-WASTE MANAGEMENT (EWM)

E-waste or electronic waste includes electric and electronic waste is created when an electronic and electric product, is discarded after the end of its useful life. The rapid expansion of technology and the consumption driven society results in the creation of a very large amount of e- waste.

In terms of EWM the ULB's of Distt. Kangra has no POSITIVE OUTCOMES.

So all the Action Areas in terms of EWM needs to be improved as per detail below:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Toll Free number for deposition of E-waste. | To be Initiated |
| 2 | Collection Centers | To be established |
| 3 | Authorized E-waste Recyclers | Linkage to be made |
| 4 | Involvement of NGO's | To be initiated |
| 5 | Distt. Level Awareness Campaign | To be initiated |

## 2. WATER QUALITY MANAGEMENT PLAN: (WQMP)

In terms of WQMP the following action areas have positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Regular sampling of the river and their tributaries along with water bodies on monthly basis. | Done. The sampling of the rivers and tributaries along with Water Bodies is done on monthly basis under MINARS program. |
| 2 | Regular sampling of hand pumps/borewells on Quarterly basis. | Done. The regular sampling of hand pumps/borewells is done under MINARS program. |
| 3 | Installation of Continuous Water Quality Monitoring Station. | N.A. |
| 4 | Permission for Borewells have been brought under control of IPH | Initiated |
| 5 | Monitoring Cell for UG water &Quality Assessment | Initiated |
| 6 | RWH in Govt. Buildings | Initiated |
| 7 | Awareness Campaign for Water Conservation and Quality | Initiated |
| 8 | Domestic Sewage Management in Rural and Industrial Areas | 08 no. of STPs are operational (Dharamshala, Knagra Zone-I, Zone-II & Zone-III, Jawalamukhi, Palampur, Nagrota Bagwan and Tanda) |

In terms of WQMP the following action areas have negative outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Domestic Sewage Management in rural and industrial areas | 02 STPs (Nurpur and Dehra) are proposed |
| 2 | Industrial area, Kandrori Effluent Treatment Plant status | 01 Common Effluent Treatment Plant (CETP) of capacity 7 MLD is under construction in Kandrori. |
| 3 | No proper plan for immersion of idols and worship materials in Rivers, Nallahs / Water Bodies in Distt. Kangra H.P. | Awareness being done. |
| 4 | Open side defecation problem | Not controlled, awareness program by NGO and local bodies. |
| 5 | Dumping of solid waste | Not controlled. |

**Current Scenario of Water Quality in District Kangra:**

Assessment of the status of water quality of the natural water bodies is one of the most important activity of the Pollution Control Board. Water quality data not only help to ascertain the nature and extent of the requirement for pollution control measures but also indicates its impact on water quality. The Central Pollution Control Board under the National Programme Monitoring of National Aquatic Resources (MINARS) is sponsoring the water quality monitoring of major rivers of the State. The monitoring has been carried out on monthly basis.

The Samples are being analyzed for physico-chemical and bacteriological contents. The results are shown below:

**Results of Major Rivers (MINARS) Points from April 2018 to March 2019**

| Sr. No. | Name Of Location | Parameter | Apr. 18 | May 18 | Jun 18 | Jul. 18 | Aug 18 | Sept 18 | Oct.18 | Nov. 18 | Dec. 18 | Jan. 19 | Feb. 19 | Mar. 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | River Binwa D/S Paprola/ Baijnath | pH | 7.08 | 7.76 | 8.02 | 7.81 | 6.79 | 7.12 | 7.34 | 7.32 | 7.02 | 7.02 | 7.28 | 7.62 |
| | | DO | 8.70 | 7.5 | 7.5 | 7.8 | 7.6 | 7.7 | 7.5 | 7.5 | 7.7 | 8.5 | 8.6 | 8.5 |
| | | BOD | 0.20 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.4 | 0.3 | 0.1 | 0.2 |
| | | TC | -- | -- | 170 | 180 | 79 | 110 | 79 | 70 | 70 | 79 | 63 | 63 |
| 2. | River Neugal D/S Thural | pH | 8.46 | 7.63 | 7.76 | 7.54 | 7.84 | 7.32 | 7.86 | 7.58 | 7.72 | 8.06 | 7.9 | 7.48 |
| | | DO | 7.90 | 7.3 | 7.3 | 7.8 | 7.9 | 7.8 | 7.3 | 7.4 | 7.8 | 8.2 | 8.7 | 8.5 |
| | | BOD | 0.20 | 0.3 | 0.4 | 0.1 | 0.3 | 0.4 | 0.3 | 0.3 | 0.4 | 0.3 | 0.1 | 0.1 |
| | | TC | 70 | 180 | 220 | 140 | 110 | 94 | 110 | 94 | 63 | 79 | 94 | 79 |
| 3. | River Beas D/S Jaisinghpur | pH | 8.28 | 8.01 | 7.56 | 6.92 | 7.48 | 7.88 | 7.96 | 7.9 | 7.82 | 7.86 | 7.72 | 7.56 |
| | | DO | 8.70 | 7.0 | 7.4 | 8.5 | 8.0 | 7.0 | 7.4 | 7.6 | 7.5 | 10.5 | 9.1 | 9.1 |
| | | BOD | 0.20 | 0.6 | 0.3 | 0.3 | 0.4 | 0.5 | 0.7 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 |
| | | TC | 110 | 110 | 280 | 170 | 280 | 110 | 130 | 79 | 94 | 170 | 130 | 94 |
| 4. | River Beas D/S Alampur | pH | 8.3 | 7.74 | 7.59 | 6.89 | 7.82 | 8.04 | 8.08 | 7.84 | 8.05 | 8.04 | 7.62 | 7.52 |
| | | DO | 8.7 | 7.2 | 7.3 | 8.1 | 8.0 | 7.3 | 7.3 | 7.5 | 7.6 | 10.3 | 9.3 | 9.0 |
| | | BOD | 0.3 | 0.8 | 0.3 | 0.4 | 0.3 | 0.3 | 0.8 | 0.4 | 0.3 | 0.4 | 0.5 | 0.4 |
| | | TC | 79 | 130 | 170 | 180 | 170 | 130 | 79 | 110 | 79 | 150 | 84 | 110 |
| 5. | River Ravi | pH | 7.22 | 7.96 | 7.52 | 7.08 | 6.98 | 8.31 | 8.39 | 7.94 | 6.92 | 7.05 | 7.62 | -- |

| Sr. No. | Name Of Location | Parameter | Apr. 18 | May 18 | Jun 18 | Jul. 18 | Aug 18 | Sept 18 | Oct.18 | Nov. 18 | Dec. 18 | Jan. 19 | Feb. 19 | Mar. 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **U/s Madhopur HW** | DO | 7.3 | 7.2 | 7.5 | 7.1 | 7.2 | 7.3 | 7.6 | 7.2 | 7.3 | 9.2 | 7.6 | -- |
| | | BOD | 0.3 | 0.1 | 0.2 | 0.1 | 0.1 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | -- |
| | | TC | 170 | -- | 220 | 140 | 94 | -- | -- | 110 | 49 | 79 | 79 | -- |
| **6.** | **River Beas Pong Dam at Pong Village (1292)** | pH | 8.10 | 8.07 | 7.18 | 7.36 | 7.04 | 8.04 | 7.42 | 7.59 | 12.5 | 7.26 | 7.48 | 7.06 |
| | | DO | 7.2 | 7.0 | 7.0 | 6.9 | 7.3 | 7.4 | 7.4 | 7.3 | 7.2 | 8.2 | 8.3 | 8.7 |
| | | BOD | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.3 | 0.2 | 0.3 | 0.2 | 0.1 | 0.2 | 0.3 |
| | | TC | 180 | -- | -- | 180 | 140 | -- | 94 | 70 | 63 | 94 | 94 | 94 |
| **7.** | **River Beas D/S Pong Dam** | pH | 7.66 | 8.13 | 7.28 | 7.32 | 7.18 | 8.15 | 7.54 | 7.96 | 7.92 | 7.43 | 7.24 | 7.18 |
| | | DO | 7.5 | 7.2 | 6.9 | 7.3 | 7.2 | 6.9 | 7.3 | 7.2 | 7.1 | 8.7 | 8.9 | 8.9 |
| | | BOD | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.4 | 0.3 | 0.4 | 0.1 | 0.4 | 0.3 | 0.2 |
| | | TC | 220 | -- | -- | 170 | 94 | -- | 79 | 63 | 94 | 110 | 110 | 130 |
| **8.** | **River Beas D/S Dehra** | pH | 7.5 | 8.42 | 8.06 | 7.52 | -- | 7.65 | 7.32 | 7.93 | 7.88 | 7.58 | 7.38 | 7.25 |
| | | DO | 7.3 | 7.6 | 6.7 | 6.7 | -- | 7.0 | 7.1 | 6.9 | 7.1 | 9.5 | 7.9 | 9.5 |
| | | BOD | 0.8 | 0.2 | 0.4 | 0.4 | -- | 0.5 | 0.3 | 0.4 | 0.3 | 0.2 | 0.5 | 0.2 |
| | | TC | 70 | 220 | 170 | 180 | -- | 110 | 130 | 79 | 79 | 70 | 70 | 170 |
| **9.** | **Mol Khad U/s Palampur** | pH | -- | 7.25 | 7.88 | 7.65 | 7.08 | 7.34 | 7.38 | 7.45 | 7.28 | 7.43 | 7.14 | 7.7 |
| | | DO | -- | 7.4 | 7.2 | 7.4 | 7.4 | 7.3 | 7.2 | 7.2 | 7.6 | 8.2 | 8.4 | 8.3 |
| | | BOD | -- | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 |
| | | TC | -- | 70 | 180 | 220 | 94 | 170 | 70 | 79 | 79 | 94 | 79 | 70 |
| **10.** | **Mol Khad D/s Palampur** | pH | -- | 7.31 | 7.91 | 7.53 | 6.94 | 7.18 | 7.88 | 7.38 | 7.42 | 7.53 | 7.02 | 7.72 |
| | | DO | -- | 7.0 | 7.3 | 7.3 | 7.3 | 7.2 | 7.1 | 7.3 | 7.3 | 8.1 | 8.2 | 8.2 |
| | | BOD | -- | 0.4 | 0.2 | 0.1 | 0.1 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 |
| | | TC | -- | 140 | 220 | 280 | 70 | 130 | 120 | 94 | 63 | 79 | 110 | 110 |
| **11.** | **Manjhi Khad U/s Dharamshala** | pH | -- | -- | 7.21 | 7.23 | -- | -- | 7.54 | 7.82 | -- | 7.35 | 7.58 | 7.15 |
| | | DO | -- | -- | 6.9 | 6.2 | -- | -- | 6.3 | 6.5 | -- | 7.2 | 7.1 | 7.4 |

| Sr. No. | Name Of Location | Parameter | Apr. 18 | May 18 | Jun 18 | Jul. 18 | Aug 18 | Sept 18 | Oct.18 | Nov. 18 | Dec. 18 | Jan. 19 | Feb. 19 | Mar. 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | at Khaniara | BOD | -- | -- | 0.2 | 0.1 | -- | -- | 0.1 | 0.3 | -- | 0.2 | 0.1 | 0.1 |
| | | TC | -- | -- | -- | 130 | -- | -- | 70 | 49 | -- | 63 | 70 | 140 |
| 12. | Manjhi Khad D/s Dharamshala at Chetru | pH | -- | -- | 7.18 | 7.76 | -- | -- | 7.82 | 7.48 | -- | 7.66 | 7.63 | 7.32 |
| | | DO | -- | -- | 7.1 | 6.5 | -- | -- | 6.0 | 6.2 | -- | 7.5 | 7.6 | 7.2 |
| | | BOD | -- | -- | 0.1 | 0.1 | -- | -- | 0.2 | 0.2 | -- | 0.3 | 0.2 | 0.2 |
| | | TC | -- | -- | -- | 170 | -- | -- | 79 | 46 | -- | 70 | 63 | 170 |

## Results of State Water Quality Monitoring Points from April 2018 to March 2019

| Sr. No. | Name of location | Parameters | Apr.-18 | July-18 | Oct.-18 | Jan.-19 |
|---|---|---|---|---|---|---|
| 1. | Chounch Khad D/s Ind. Area Bain Attarian | pH | -- | -- | 8.21 | 7.98 |
| | | DO | -- | -- | 6.2 | 6.8 |
| | | BOD | -- | -- | 0.4 | 0.5 |
| | | TC | -- | -- | -- | 110 |
| 2. | Chounch Khad U/s Ind. Area Bain Attarian | pH | -- | -- | 8.16 | 7.78 |
| | | DO | -- | -- | 6.8 | 6.9 |
| | | BOD | -- | -- | 0.2 | 0.3 |
| | | TC | -- | -- | -- | 94 |
| 3. | River Beas U/S Pong Dam | pH | 7.74 | -- | -- | 7.5 |
| | | DO | 7.20 | -- | -- | 8.9 |
| | | BOD | 0.20 | -- | -- | 0.2 |
| | | TC | 180 | -- | -- | -- |
| 4. | U/S Swan Khad IA Sansarpur Terrace | pH | -- | -- | -- | 7.58 |
| | | DO | -- | -- | -- | 7.3 |
| | | BOD | -- | -- | -- | 0.2 |
| | | TC | -- | -- | -- | 110 |
| 5. | D/S Swan Khad IA Sansarpur Terrace | pH | 7.82 | -- | -- | 7.24 |
| | | DO | 6.20 | -- | -- | 7.2 |
| | | BOD | 0.40 | -- | -- | 0.5 |

| Sr. No. | Name of location | Parameters | Apr.-18 | July-18 | Oct.-18 | Jan.-19 |
|---|---|---|---|---|---|---|
| | | TC | 220 | -- | -- | 130 |
| **6.** | **Lund Khad U/s STP Jawalamukhi** | pH | 7.58 | -- | 8.25 | 7.63 |
| | | DO | 7.60 | -- | 7.1 | 7.8 |
| | | BOD | 0.20 | -- | 0.3 | 0.3 |
| | | TC | -- | -- | 110 | 49 |
| **7.** | **Lund Khad D/s STP Jawalamukhi** | pH | 7.56 | -- | 8.38 | 7.81 |
| | | DO | 7.70 | -- | 7.0 | 7.4 |
| | | BOD | 0.20 | -- | 0.5 | 0.4 |
| | | TC | -- | -- | 140 | 63 |
| **8.** | **Baner Khad U/s STP TMC** | pH | 7.56 | -- | 7.67 | 7.92 |
| | | DO | 7.30 | -- | 7.3 | 8.1 |
| | | BOD | 0.20 | -- | 0.3 | 0.2 |
| | | TC | -- | -- | 94 | 79 |
| **9.** | **Baner Khad D/s STP TMC** | pH | 7.62 | -- | 7.76 | 7.86 |
| | | DO | 7.40 | -- | 7.1 | 8.3 |
| | | BOD | 0.30 | -- | 0.5 | 0.3 |
| | | TC | -- | -- | 79 | 70 |
| **10.** | **Charan Khad U/S STP Dharamshala** | pH | 7.29 | -- | 7.93 | 7.38 |
| | | DO | 7.30 | -- | 7.1 | 7.4 |
| | | BOD | 0.20 | -- | 0.3 | 0.2 |
| | | TC | -- | -- | 94 | -- |
| **11.** | **Charan Khad D/S STP Dharamshala** | pH | 7.50 | -- | 7.88 | 7.68 |
| | | DO | 7.20 | -- | 7.1 | 7.2 |
| | | BOD | 0.20 | -- | 0.2 | 0.3 |
| | | TC | -- | -- | 110 | -- |
| **12.** | **Dal Lake Naddi** | pH | 7.04 | -- | 7.44 | 7.06 |
| | | DO | 7.90 | -- | 7.3 | 8.1 |
| | | BOD | 0.30 | -- | 0.7 | 0.4 |
| | | TC | 220 | -- | 110 | -- |

| TABLE B: PRIMARY WATER QUALITY CRITERIA | | |
|---|---|---|
| **Designated Best Use** | **Class of Water** | **Criteria** |
| Drinking water source without conventional treatment but after disinfection. | A | 1. Total Coliform organism MPN/100ml. shall be 50 or less.<br>2. pH between 6.5 and 8.5.<br>3. Dissolved Oxygen 6 mg/l or more.<br>4. Biochemical Oxygen Demand 5 days 20$^{o}$C 2 mg/l or less. |
| Outdoor bathing (Organized) | B | 1. Total Coliform organism MPN/100ml.shall be 500 or less.<br>2. pH between 6.5 and 8.5.<br>3. Dissolved Oxygen 5 mg/l or more.<br>4. Biochemical Oxygen Demand 5 days 20$^{o}$C 3 mg/l or less. |
| Drinking Water Source after conventional treatment and disinfection | C | 1. Total Coliform organism MPN/100ml.shall be 5000 or less.<br>2. pH between 6 and 9.<br>3. Dissolved Oxygen 4 mg/l or more.<br>4. Biochemical Oxygen Demand 5 days 20$^{o}$C 3 mg/l or less. |
| Propagation of Wild Life & Fisheries | D | 1. pH between 6.5 and 8.5.<br>2. Dissolved Oxygen 4 mg/l or more.<br>3. Free Ammonia (as N) 1.2 mg/l or less. |
| Irrigation, Industrial Cooling Controlled Waste Disposal | E | 1. pH between 6.5 and 8.5.<br>2. Electrical Conductivity at 25$^{0}$C micro mhos /cm max. 2250.<br>3. Sodium absorption ratio Max. 26.<br>4. Boron Max 2 mg/l. |

If three parameters falls in category ‘A’ but fourth parameter falls in category C then the overall quality of river will fall under Class ‘C’.

Following conclusion were drawn from the above studies:

In case of major rivers on the basis of Primary Water Quality Criteria, it can be concluded that water quality of rivers fall under ‘A’ category of water with respect to pH, DO and BOD in general. The critical parameters observed is Total Coliform according to which category of river comes down to either category ‘B’ if the Total Coliform are more than 50 MPN/ 100 ml or category ‘C’ if the Total Coliform are more than 500 MPN/100ml.

## 3. DOMESTIC SEWAGE MANAGEMENT PLAN (DSMP) DATA ANALYSIS

Domestic Sewage is a type of waste water that is produced by a community of people and is characterized by volume of flow, physical condition, chemical characteristics and toxic constituents and bacteriological status.

In terms of DSMP, the following action areas have positive outcomes in r/o Distt. Kangra:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | 08 no. of STPs are functioning in various local bodies. | In operation |
| 2 | 02 nos. of STPs ( Nurpur and Dehra) | Under Construction |
| 3 | 01 CETP of capacity 7 MLD | Under Construction |

In terms of, the following action areas have negative outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Lacking of STP's in Industrial Area & Maximum areas of District | 08 no. of STPs are operational and 02 STPs are proposed<br>01 CETP of capacity 7 MLD is under process in Kandrori |

Water samples were collected from final outlets of the operational Sewage Treatment Plants during the year 2018-19. The analysis results are detailed below. Notices have been issued to I&PH Department to bring the effluent quality of the concerned STPs within the prescribed limits and to comply with all the provisions of Water (Prevention & Control of Pollution) Act, 1974.

**STP Results for the period 2018-19**

| STP | Date of sampling | SS 100mg/ Ltr | BOD 30mg/ Ltr | COD 250mg/ Ltr | O&G 10mg/ Ltr | ph 5.5-9.0 |
|---|---|---|---|---|---|---|
| Dharamshala | 04-04-2018 | 28 | 2 | 16 | Nil | 7.76 |
| | 05-29-2018 | 30 | 8 | 76 | 0.68 | 7.61 |
| | 06-29-2018 | 16 | 5.5 | 40 | 0.44 | 7.1 |
| | 07-31-2018 | 11 | 2.5 | 36 | Nil | 7.87 |
| | 04 -10-2018 | 5 | 5 | 64 | 0.16 | 7.81 |
| | 12-24-2018 | 39 | 3.5 | 28 | 0.2 | 7.98 |
| | 11-28-2018 | 49 | 18 | 80 | 0.36 | 7.92 |
| | 01.05.2019 | 17 | 2.6 | 24 | 0.2 | 7.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 03-18-2019 | 29 | 9 | 60 | 0.32 | 7.52 |
| Jawalamukhi | 04-05-2018 | 5 | 9 | 56 | 0.48 | 7.89 |
| | 05-31-2018 | 44 | 8 | 64 | 0.56 | 7.94 |
| | 06-14-2018 | 6 | 8 | 52 | Nil | 8.03 |
| | 09-02-2018 | 2 | 5 | 44 | Nil | 7.32 |
| | 08-08-2018 | 2 | 1.2 | 20 | Nil | 7.76 |
| | 08-10-2018 | **152** | **95** | **264** | 0.4 | 7.82 |
| | 03-01-2019 | 25 | 20 | 104 | 0.48 | 7.98 |
| | 02-25-2018 | 6 | 14 | 84 | 0.4 | 7.76 |
| | 12-03-2018 | 3 | 3 | 52 | 0.28 | 7.48 |
| Kangra Zone I | 04-28-2018 | 23 | 6 | 40 | 0.32 | 8.42 |
| | 05-29-2018 | 44 | 5 | 68 | Nil | 7.16 |
| | 06-29-2018 | 16 | 6 | 48 | 0.32 | 7.21 |
| | 07-30-2018 | 29 | 3.5 | 56 | 0.28 | 7.74 |
| | 03-01-2019 | 62 | 12 | 64 | 0.4 | 7.75 |
| | 09-01-2019 | 16 | 12 | 60 | 0.48 | 7.85 |
| | 12-03-2019 | 80 | 17 | 100 | 0.24 | 7.73 |
| | 03-18-2019 | 68 | 13 | 84 | 0.48 | 8.06 |
| Kangra Zone II | 06-29-2018 | 9 | 2 | 20 | Nil | 7.82 |
| | 07-30-2018 | 6 | 4 | 64 | 0.32 | 8.67 |
| | 08-10-2018 | 36 | 5 | 40 | 0.16 | 9.42 |
| | 09-01-2018 | 23 | 10 | 64 | 0.24 | 7.56 |
| | 12-03-2018 | 28 | 6 | 60 | 0.24 | 7.5 |
| | 03-01-2019 | 12 | 12 | 88 | 0.48 | 7.32 |
| | 03-18-2019 | 21 | 3.5 | 40 | 0.12 | 7.34 |
| Kangra Zone III | 04-28-2018 | 21 | 3.5 | 36 | Nil | 8.32 |
| | 05-29-2018 | 30 | 3.5 | 44 | Nil | 7.09 |
| | 06-29-2018 | 10 | 0.8 | 12 | 0.28 | 7.14 |
| | 07-30-2018 | 32 | 0.8 | 16 | Nil | 7.68 |
| | 03-01-2019 | 30 | 5 | 56 | Nil | 7.66 |
| | 09-01-2019 | 19 | 5 | 48 | 0.32 | 7.71 |
| | 12-03-2019 | 32 | 6 | 68 | 0.32 | 7.52 |
| | 03-18-2019 | 32 | 6 | 64 | 0.4 | 7.38 |
| Nagrota bagwan | 03-01-2019 | 32 | 5.5 | 48 | Nil | 7.28 |
| | 04-28-2018 | 3 | 3 | 28 | Nil | 7.88 |
| | 05-29-2018 | 11 | 7 | 52 | 0.48 | 7.12 |
| | 06-29-2018 | 11 | 2.4 | 20 | 0.28 | 7.12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 07-30-2018 | 6 | 0.8 | 16 | Nil | 7.64 |
| | 08-16-2018 | 16 | 6 | 44 | 0.4 | 7.22 |
| | 09-01-2019 | 21 | 5 | 40 | 0.36 | 8.82 |
| | 09-01-2019 | 21 | 5 | 40 | 0.36 | 8.82 |
| | 12-03-2019 | 55 | 19 | 104 | 0.32 | 7.45 |
| | 12-03-2019 | 30 | 12 | 72 | 0.16 | 7.62 |
| | 03-18-2019 | 52 | 20 | 112 | 0.2 | 7.14 |
| Palampur | 04-03-2018 | 42 | ***40*** | 132 | 0.96 | 6.92 |
| | 05-21-2018 | 54 | 18 | 104 | 0.92 | 6.63 |
| | 06-18-2018 | 3 | 5 | 36 | 0.16 | 7.19 |
| | 07-03-2018 | 11 | 2 | 20 | 0.28 | 6.64 |
| | 08-06-2018 | 60 | 1.8 | 20 | 0.16 | 6.54 |
| | 09-04-2018 | 46 | 19 | 104 | 1.04 | 7.09 |
| | 12-21-2018 | **128** | **36** | 196 | 0.96 | 7.12 |
| | 09-01-2018 | 38 | 9 | 56 | 0.32 | 7.38 |
| | 02-28-2019 | 25 | 5.5 | 44 | 0.28 | 7.45 |
| | 03-20-2019 | 14 | 8 | 72 | 0.48 | 7.36 |
| | 04-04-2019 | 18 | 11 | 64 | 0.48 | 7.69 |
| Tanda Medical Collage | 04-28-2018 | 6 | 3 | 32 | Nil | 7.67 |
| | 05-29-2018 | 24 | 10 | 64 | 0.68 | 7.08 |
| | 09-29-2018 | 16 | 5 | 40 | 0.16 | 7.4 |
| | 07-30-2018 | 11 | 1 | 20 | Nil | 7.16 |
| | 08-16-2018 | 72 | 26 | 148 | 0.96 | 6.58 |
| | 09-01-2018 | 18 | 4 | 36 | 0.28 | 7.58 |
| | 03-19-2019 | 38 | 8 | 64 | 0.16 | 7.42 |

## 4. INDUSTRIAL WASTE WATER MANAGEMENT PLAN: (IWMP)

In terms of IWMP the following Action Areas has positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | CETF ( Common Effleunt Treatment Facility) by means of CETP | Initiated in Kandrori industrial area. There are 45 industrial units having ETPs and 11 no. of units having STPs in the district Kangra. |
| 2 | Maximum no. of Industries having their own ETP's | Industries have provided their own ETPs. Number of ETPs = 45 |
| 3 | Complaints regarding industrial pollution | Complaint redressal system. Immediately the complaints are attended and problems are solved. |
| 4 | Reusing of treated effluent by Industries | Most of Industries are reusing treated effluent in Gardening/floor washing, etc. |
| 5 | Direction and action to be taken against the industry for improving the conditions of existing Water Pollution Control Devices and increase in vigilance | Being done. Regular inspection and monitoring of all industries is being carried out by HPSPCB. If any violation is observed, HPSPCB is taking strict against under Water Act, 1974 and Air Act, 1981. Recently Environmental Compensation was imposed on total 9 no of industries for violating the norms. |
| 6 | Adoption of ZLD by Industries | Initiated |

**NEGATIVE OUTCOMES:**

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Untreated domestic sewage from industrial areas | The industrial units having manpower more than 150 no have provided their own STPs and Govt. owned industrial area have common septic tanks, which are required to be upgraded in terms of capacity enhancement and treatment technology up gradation. |
| 2 | Discharge Standards by Industries | Regular surveillance is carried out. |

## 5. AIR QUALITY MANAGEMENT PLAN (AQMP)

Air Quality Management refers to all the activities, for which regulatory authority undertakes to help and protect human health and the environment from the harmful effects of air pollution ,in order to achieve the air quality goals successfully. The air quality managers need to implement programmes for pollution control strategies.

The following action areas in terms of AQMP have positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Establishment of AQM Stations | 2 AQM Stations are in the district. |
| 2 | Proper Identification of Air Polluting Sources | Initiated |
| 3 | Control open Burning Stubble | Controlled, no incident reported. |
| 4 | Control of Forest Fires | Partially |
| 5 | Vehicle Pollution Act | During the current year 2 awareness camps have been organized. |
| 6 | Up-gradation of Air Pollution Control Devices | All air polluting industries have provided APCDs i.e. Cyclones, Bag filters, ESPs, wet scrubbers etc and upgraded as per revised stringent norms. |
| 7 | Maintenance of roads to control fugitive emissions | Being done. The action plan is already prepared for Non-Attainment Cities in reference to OA No. 681/2018 by Hon'ble NGT and is being implemented. This need is required to be catered for the other parts of the district also. |
| 8 | Plantation | HPSPCB has carried out plantation of approx. 15173 plants in Damtal area ( Sirat and nearby panchayats). |

**The following action areas in terms of AQMP has negative outcomes**

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Vehicular Pollution Control | Initiated. |
| 2 | Dust suppression | Partially initiated. Roads pavements needs to be pucca one. |
| 3 | Air Pollution Complaint Redressal System | The complaints are attended and problems are solved. |
| 4 | Encourage use of cleaner fuels (pet coke/furnace oil/LSHS may be avoided). | Initiated. |

**Current Scenario of Air Quality in District Kangra:**

The monitoring of Ambient Air Quality was started in 1986-87 under the **National Ambient Air Quality Monitoring Programme (NAMP)** with the objective to find the current status of pollution and to study the trends as a result of increasing industrialization. The general objectives of the programme are:

1. To evaluate the general air quality conditions in the cities and to provide the basis for analyzing long term trends of pollution concentrations.

2. To provide the data for subsequent development of air quality standards and pollution prevention and control programme for the cities.

The Respirable Suspended Particulate Matter (RSPM) is monitored with the help of Respirable Dust Sampler on the basis of three days per station per week for 24 hours.

Air quality standards fixed for 24 hour average is 100 $\mu g/m^3$ for RSPM, 60 $\mu g/m^3$ for $PM_{2.5}$, 80 $\mu g/m^3$ for $SO_2$& $NO_2$, 100 $\mu g/m^3$ for $O_3$ (8 hours), 400 $\mu g/m^3$ for $NH_3$ and annual average standard is 60 $\mu g/m^3$for RSPM, 40 $\mu g/m^3$ for $PM_{2.5,}$ 50 $\mu g/m^3$ for $SO_2$, 40 $\mu g/m^3$ for $NO_2$, and 100 $\mu g/m^3$ for $NH_3$.

**Annual average of $SO_2$, $NO_2$, $NH_3$ & $O_3$of NAMP Stations in Kangra for the year 2018-19**

| Stations | $SO_2$ Annual Average | $NO_2$ Annual Average | $NH_3$ Annual Average | $O_3$ Annual Average |
|---|---|---|---|---|
| Damtal I | 2.0 | 10.4 | 0.4 | 3.2 |
| Damtal II | 2.0 | 10.5 | 0.4 | 3.0 |
| Kotwali Bazar, Dharamshala | 2.0 | 6.5 | 0.3 | 3.0 |

| | | | | |
|---|---|---|---|---|
| HPSPCB, Residential Building, Daari, Dharamshala | 2.0 | 6.9 | 0.3 | 3.0 |

**Annual Average of RSPM and PM 2.5 of NAMP Stations in District Kangra for the year 2018-19**

| **Stations** | **RSPM Annual Average** | **$PM_{2.5}$ Annual Average** |
|---|---|---|
| Damtal I | 63.2 | 26.8 |
| Damtal II | 60.3 | 28.1 |
| Kotwali Bazar, Dharamshala | 36.8 | 15.4 |
| HPSPCB, Residential Building, Dari, Dharamshala | 43.8 | 19.7 |

**CONCLUSION:**

Annual average values of $SO_2$, $NO_x$, $NH_3$ & $O_3$ at the NAMP stations were observed well below the permissible limit for the annual average. The annual average values of RSPM at Damtal station I&II was observed above the permissible limits for the annual average. While at NAMP Station at Dharamshala Station-I&II was observed well below the permissible limit for the annual average. The Peak value of RSPM was observed 871 $\mu g/m^3$ at Damtal NAMP station-I during the month of June-2018 & peak value of $PM_{2.5}$ was observed 148.0$\mu g/m^3$ at Damtal Station-I during the month of June 2018.

At NAMP Damtal Station-I & II and Dharamshala Station-I & II, increase in the level of RSPM has been observed in comparison to previous year data.

## 6. MINING ACTIVITY MANAGEMENT PLAN (MAMP)

There are 39 (25 in Kangra and 14 in Nurpur) number of major areas of mining for Sand Stone & Bajari in Distt. Kangra but general mining activities for collection of sand and pebbles are common in the rivers of Distt. Kangra.

In terms of MAMP the following action areas has positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Controlling Mining Activity | Initiated |
| 2 | Complaints against Mining Pollution | NIL |

In terms of **MAMP the following action areas has negative outcomes:**

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Air Pollution caused due to mining | Controlled |
| 2 | Pollution of Water Bodies due to Mining | No such case detected. |
| 3 | Sound Pollution due to Mining Activities | Controlled. |

## 7. NOISE POLLUTION MANAGEMENT PLAN (NPMP)

Noise Pollution also known as Environmental Noise or Sound Pollution: the propagation of Noise with harmful impact on the activity of Human or Animal Life. The sources of Noise Pollution may be Machines, Transport or Propagation Systems.
In terms of NPMP the following Action Areas have positive outcomes:

| Sr. No. | Action Areas | Outcome |
|---|---|---|
| 1 | Noise Monitoring | Being conducted regularly |
| 2 | Sign Boards in Towns | Installed time to time for public awareness but at present requires attention. |
| 3 | Implementation of Ambient Noise Standards & Court orders in Residential/Silent Zones | Implemented |

The State Board is regularly conducting ambient noise monitoring for different areas/zones at selected locations (4 locations) in the District. The State Board is regularly spreading awareness about adverse affect of noise pollution among public through advertisement in newspaper and jingle through FM radio.

As per notification dated 1-5-2001 issued by the State Government, the respondent State Board has mandate to submit report to the State Government regarding complaint received and disposed off under the provisions of Noise Rules 2000.

Further, State Board regularly issues directions to all Deputy Commissioner/Superintendent of Police and Regional Officers of the State Board to take necessary measures to comply with the Noise Pollution (Regulation and Control) Rules, 2000 regarding monitoring and control of noise pollution and ensure that noise and ambient air quality standards are maintained within area of their jurisdiction during Diwali festival. The State Education Department is also being advised to educate students about the harmful effect of noise & air pollution. The State Board also monitors ambient noise monitoring during Diwali festival to assess the air and noise pollution due to bursting of firecrackers, besides, conducting awareness campaign/ mass awareness program for reduction of bursting of fire crackers.

# ACTION PLAN

## SOLID WASTE MANAGEMENT PLAN IN R/O DISTT. KANGRA

### ACTION PLAN/MITIGATION MEASURES (SWM) IN R/O ULB'S

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | Formation of Ward Sanitation Committee | ULB | To keep vigil and educate people |
| 2 | To make ULB's Dust Bin Free(LARGE DUSTBINS ONLY) and to increase 100% door to door collection, | ULB | Proper Collection and Segregation |
| 3 | Involvement of NGO's/ECO clubs NCC/NSS/Scout Guide | ULB/ Schools/ Colleges | Awareness |
| 4 | Segregation at Collection Vehicle Level | ULB | Segregation |
| 5 | Use of Sanitary Land Fills | ULB | Proper Disposal |
| 6 | Material Recovery Facility | ULB | Recovery |
| 7 | Reuse of flowers in making Dhoop &Agarbattis | ULB | Conversion of waste into useful dhoop and agarbatties.Thus proper use. |

### ACTION PLAN/MITIGATION MEASURES (SWM) IN R/O RURAL AREAS

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | Reuse of Gobar (Dung in making Bio Bricks/Flower Pots/Logs) | Panchayat | To be used in Funeral& as Fuel |
| 2 | Reuse of Gobar as DIYAS | Panchayat | Lighting. |
| 3 | Agriculture Waste as Fuel or Compost | Panchayat | Fuel & Manure |
| 4 | Pine Needles | Industries | Fuel Briquette |
| 5 | Lantana | Industries | Furniture |
| 6 | Cow Urine | Panchayat | Pesticide/Fertilizer |
| 7 | Zero waste management shed | DRDA | Segregation of waste |
| 8 | Making of soak pits for liquid waste | DRDA | Control of water pollution. |
| 9 | Establishment of Distt. Compost Research Centre | Distt. Adm. | Scientific disposal |

## ACTION PLAN FOR PLASTIC WASTE MANAGEMENT

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | PW Collection centers | ULB/Panchayat | Collection |
| 2 | Authorization of PW Pickers | ULB/Panchayat | Collection |
| 3 | Linkage with NGO's/ECO Clubs | ULB's/Schools | Awareness & Collection |
| 4 | Use in Road Making | PWD | Disposal |
| 5 | Making of Poly bricks, Poly wall, Poly toilets, Poly benches | Panchayat | Reuse |
| 6 | Fuel for Cement kiln | Industries | Disposal |

## ACTION PLAN/ MITIGATION MEASURES FOR C&D WASTE

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | Establishment of Deposition Points | ULB/Panchayat | Collection/Settlement |
| 2 | CD Waste Recycling Plant | ULB | Recycling |
| 3 | Empty Cement Bags | ULB/Panchayat | Recycling . |

## ACTION PLAN/MITIGATION MEASURES FOR BIOMEDICAL WASTE MANAGEMENT

The Ministry of Environment ,Forest & Climate Change Govt. of India vide notification GSR-343(E) dated 28-03-2016 has notified Bio Medical Waste Management Rules 2016 for the collection, transportation and disposal of Biomedical Waste to treatment facilities for treatment :

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | CBWTF Facilities for each medical block | Health Deptt., Ayurveda/Vet. | Proper & Regular Disposal |
| 2 | BAR CODE system | Health, HPSPCB | Effective disposal |
| 3 | Covering of Ayurvedic and Vet. Hospials Under CBWTF | Health, HPSPCB | Proper Disposal |
| 4 | Regular Inspection by HPSPCB | HPSPCB | Proper Functioning |

## ACTION PLAN/MITIGATION MEASURES FOR HAZARDOUS WASTE MANAGEMENT

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 3 | HW treatment plant at Distt level (one plant established in Sansarpur Terrace) | HPSPCB | Treatment |
| 4 | Implementation of bylaws | HPSPCB | Proper regulation |
| 5 | Approval of non HW industries | Industry | Environment. Protection |

## ACTION PLAN/ MITIGATION MEASURES FOR E-WASTE MANAGEMENT

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | TOLL FREE NO. FOR COLLECTION | ULB/Panchayat | Collection |
| 2 | Collection Centers | ULB/Panchayat | Collection |
| 3 | Authorization of EW Pickers | ULB/Panchayat | Collection |
| 4 | Proper Disposal Centers | ULB/HPSPCB | Disposal |
| 5 | Mass Awareness | ULB/Panchayat ,PCB | Awareness |
| 6 | Extended Producer Responsibility | Producer/ULB | Collection and Proper Disposal |

## ACTION PLAN/ MITIGATION MEASURES FOR WATER QUALITY MANAGEMENT

In Distt. Kangra there are three types of water sources namely: Rivers, Water Bodies, Under Ground Water sources which are being affected by various humans/animals activities etc. The following measures are needed for Water Quality Management**:**

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | Mobile toilets for industrial areas | Industries | ODF |

| | | | |
|---|---|---|---|
| 2 | Biodegradable Idols | ULB | Contamination Free |
| 3 | Worship Material Biodegradable | ULB/Panchayat/HPSPCB | Contamination Free |
| 4 | Ban on Commercial Sale of Water | IPH | Replenishment of UGW |
| 5 | Water Recharge Methods | IPH | Increase the UG Water Level |
| 6 | Plantation | Forest/ Panchayat | Rain & Increase the UG |
| 7 | Mass Awareness | DPRO/Education/PCB | Awareness about quality |

**ACTION PLAN/MITIGATION MEASURES FOR DOMESTIC SEWAGE MANAGEMENT**

| S.No. | Action Areas | Agency | Remarks |
|---|---|---|---|
| 1 | Need of Common STP's | ULB & rural development. | Collection and Treatment |
| 3 | Bio Fuel Cell | ULB & Rural Development. | Treatment and electricity production |

**PHYTOREMEDIATION (Sewage):**

With the help of certain plants the domestic sewage can be treated and it can be rid of the biotic and abiotic pollutants as these plants can absorb these pollutants from soil and water. These plants have been identified and based upon various research papers. Some of them are as follows:

| Sr. No. | Name of the Plant | Botanical Name | Remarks |
|---|---|---|---|
| 1 | Jacarnda | *Jacarndamimosifolia* | Antimicrobial Action against E.coli and Staph bacteria |
| 2 | Willow | *Salix babylonica* | Improve the quality of ground water by absorbing ammonical nitrogen and heavy metals |
| 3 | Canna | *Canna spp.* | Used for removal of ammonical nitrogen from sewage |
| 4 | Azolla | *Azollapinnata* | Used for cleaning of Sewage and degrades diesel fuel<br>And absorbs Mercury and cadmium |
| 5 | Southern Cattail | *Typhadomingenesis* | Reduces bacteria from water and absorbs Al, Fe and Zn from Sewage |

**ACTION PLAN/MITIGATION MEASURES FOR INDUSTRIAL WASTE WATER MANAGEMENT**

| Sr. No. | Action Areas | Agency | Remarks |
|---|---|---|---|
| **1.** | Inventorization of the water polluting industries in the catchment of River Markanda and Yamuna covering assessment on aspects relating to status of Consents under Water & Air Acts and Authorization, Effluent Generation, ETP Capacities and final mode of effluent discharge | HPSPCB | The inventorization of water polluting industries is already completed. There are total 45 nos of industries having ETPs and 11 nos. of industries having STPs in District Kangra. The list is enclosed herewith as Annexure. |
| 2. | ETP Plants | Industries | The water polluting industries in the district have provided ETPs and as so far 45 industries have provided ETPs. Similarly 11 STPs have also been provided in addition to 8 STPs of I &PH. |
| 3. | Landfills for industrial water from Boilers | Industries | Treatment |
| 4. | CETP | HPSPCB | In Kandrori under construction. |
| 5. | Regular Inspections | ULB /Panchayats/ Industry Department/ HPSPCB | carried out by PCB. |
| 6. | Action against the identified industries in operation without Consent under Water & Air Act/Authorization under HOWR, 2016. | HPSPCB | HPSPCB is keeping regular vigil in the area. If any industry is found without consent of State Board, power supply disconnection order is being issued. |
| 7. | Regular monitoring and sampling of water quality of Rivers and various drains on monthly basis. | HPSPCB | Regular sampling and monitoring of rivers is being done by HPSPCB on monthly basis |

**PHYTOREMEDIATION (Industrial Effluents):**

With the help of certain plants the Industrial Waste water can be treated and it can be rid of the biotic and abiotic pollutants as these plants can absorb these pollutants from soil and water. These plants have been identified and based upon various research papers. Some of them are as follows:

| Sr. No. | Name of the Plant | Botanical Name | Remarks |
|---|---|---|---|
| 1 | Golden Rain Tree | *Cassia fistula* | Absorbs Arsenic and Fluoride from Industrial Water |
| 2 | Kaner | *Neriumindiana* | Absorbs chromium from Industrial Water |
| 3 | Mulberry | *Morus alba* | Absorbs Zn, Hg, As, Pb, Cu and Cd from Industrial Water |
| 4 | Pine | *Casurinaequisetifolia* | Remediation of textile dye water |
| 5 | Sheesham | *Dalbergiasisoo* | Absorbs nutrients from sludge |
| 6 | Castor | *Ricinuscommunis* | Uptake of Cd & DDT from soil |
| 7 | Crown Flower | *Caloptropisgigantea* | Helpful in absorption of Radioactive elements from soil |
| 8 | Duckweed | *Cemma minor* | Absorbs Cr and Pb from water |
| 9 | Indian Mustard | *Brassica tunecia* | Absorbs Zinc from Soil |

**ACTION PLAN/MITIGATION MEASURES FOR AIR QUALITY MANAGEMENT**

| Sr. No. | Action Areas | Agency | Purpose |
|---|---|---|---|
| 1 | Up gradation of existing Air Pollution Control Systems | All air polluting industries have provided APCDs i.e. Cyclones, Bag filters, ESPs, wet scrubbers etc and upgraded as per revised stringent norms. | Reduction in air pollution. |
| 2 | Direction to the industries for improving the conditions of APCDs and increase in vigilance | All air polluting industries have provided APCDs i.e. Cyclones, Bag filters, ESPs, wet scrubbers etc and upgraded as per revised stringent norms. | Reduction in air pollution. |
| 3 | Providing Online Continuous Emission Monitoring System in all red-large industries. | All 17 category industries have already provided Online Continuous Emission Monitoring System | To check compliance |
| 4 | Conversion of brick kiln to induced/forced draft | The brick kilns in District Kangra have provided induced/forced draft system. Conversion of some of the units is under process. | Reduction in air pollution. |
| 5 | Proper implementation of measures for Stone Crushers | Industry | Prevents Air Pollution |

| | | | |
|---|---|---|---|
| 6 | Proper maintenance and checking of Vehicular Engines | Transport | Prevents Air Pollution |
| 7 | Road maintenance by pavement etc. | HPPWD/ NHAI/ municipal bodies/forest deptt. | Prevents Air Pollution |
| 8 | Ban on Garbage burning | ULB/ Panchayat | Prevents Air Pollution |
| 9 | Ban on burning of Agriculture /Horticulture Waste as Parali etc. | ULB/ Panchayat | Prevents Air Pollution |

**PHYTOREMEDIATION (Air Pollution):**

With the help of certain plants the pollution in air can be reduced as these plants absorb the pollutants present in air. These plants have been identified and based upon various research papers. Some of them are as follows:

| **Sr. No.** | **Name of the Plant** | **Botanical Name** | **Remarks** |
|---|---|---|---|
| 1 | Aloe Vera | *Aloe barbedensis* | Eliminates Benzene and formaldehyde from Air |
| 2 | Spider Plant | *Chlorophytumcomosum* | Eliminates Xylene, Toluene & CO from Air |
| 3 | Snake Plant | *Sansevieriaisurentii* | Eliminates Benzene, trichloroethylene from Air |
| 4 | Arica palm | *Dypsislutescens* | Eliminates Benzene, CO & Xylene from Air |
| 5 | Peepal | *Ficusreligiosa* | Produces oxygen day and night |
| 6 | Neem | *Azadirichtaindica* | Absorbs dust from air |
| 7 | MuskiKapoor | *Cinnamomumcamphora* | Insect repellent and flea killer |
| 8 | Kapoortulsi | *Ocimumkilimandscharicum* | Insect and mosquito repellent |

**ACTION PLAN/MITIGATION MEASURES FOR NOISE POLLUTION MANAGEMENT**

| **Sr. No.** | **Action Areas** | **Agency** | **Purpose** |
|---|---|---|---|
| 1 | Ban on pressure horns | Transport and Police | Prevents Noise Pollution |
| 2 | Formation of Silent Zones | Administration | Prevents Noise Pollution |

| | | | |
|---|---|---|---|
| 3 | Sound Absorbers in Industries | Industry | Prevents Noise Pollution |
| 4 | Implementation of Bylaws | Administration Police/ HPSPCB | Prevents Noise Pollution |
| 5 | Formation of Green Muffler | HPPWD/Forest and Industries | Prevents Noise Pollution |
| 6 | Proper Maintenance and service of Vehicular Engines | Transport | Prevents Noise Pollution |

**PHYTOREMEDIATION (Sound Pollution):**

With the help of certain plants the Sound levels can be reduced upto comfortable level. These plants have been identified and based upon various research papers. Some of them are as follows:

| **Sr. No.** | **Name of the Plant** | **Botanical Name** | **Remarks** |
|---|---|---|---|
| 1 | Harshingar | *Nyctanthesarbortrestis* | Absorbs noise. |
| 2 | Peace Lily | *Spthiphyllum* | Absorbs noise. |
| 3 | Weeping Fig | *Ficusbenjamina* | Absorbs noise. |
| 4 | Fiddle Leaf Fig | *Ficuslyrata* | Absorbs noise. |
| 5 | Guina Chestnut | *Pachiraaquatica* | Absorbs noise. |

# CONCLUSION

District Environment Plan emphasizes various action plans for thematic areas. In our District i.e. District Kangra the current Environmental Status is within safe limits.

There are gaps identified in each and every action area. But these Action Plans which are suggested have to be implemented to minimize these gaps. But this cannot be done only at Administration level; Public Participation is to be increased many folds to achieve the target of clean environment. Behavioral change may only be achieved by mass awareness.