



## **WATERSHED APPROACH FOR ENVIRONMENT MANAGEMENT**

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### **Abstract:**

*Environment is the most concerned topic for the planners and scholars nowadays. We are a part of environment which encircles us. The rate of environmental degradation has risen so much that it is beyond the natural controlling power to level it. This sudden change in environment is posing an irreparable threat for future. We are the destructionist of our own future by disturbing the prolong process of natural forces resulting environmental degradation and pollution. Nature tends to balance itself around its point of balance but the changes made by humans are so large scaled that no natural power can balance it but human itself by fixing the errors. Many approaches have been used from local to universal level to protect the environment but watershed approach presents the best opportunity to do so. Watershed is a region from where a river or any other water source gathers its water. It is a hydrological, geographical and geological region which meets the needs of any water source. The water source presents as the common feature which assimilates other factors around it. Watersheds are considered as the perfect planning unit. It presents a perfect unit for environmental planning and management. The present paper will discuss about the importance of watershed approach in environmental management and planning and different aspects related to it.*

**Index Terms:** Environment, Environmental Degradation, Watershed, Watershed Approach & Environmental Planning.

### **Introduction:**

Environment is the most concerned topic for the planners and scholars nowadays. We are a part of environment which encircles us. The rate of environmental degradation has risen so much that it is beyond the natural controlling power to level it. This sudden change in environment is posing an irreparable threat for future. There is one way to overcome this which is to determine the problems and find a best suitable strategy to minimize the rate of environment degradation and to do so we first have to find the best approach to understand and define the problems faced by environment.

### **Environment:**

The word environment has been derived from the French word Environir which means 'to surround'. Thus environment means which surrounds, the sum total of the conditions of the surroundings within which an organism, or group, or an object exists (including the natural conditions, the natural as modified by human activity, and the Artificial). In other words, environment is the totality of all physical, social, and biological factors, individually as well as collectively, that comprises the natural and manmade surroundings. Environment plays a vital role in sustaining life on planet earth and life is not possible in its absence so it is a major issue to protect it.

### **Environmental Degradation and Hazards:**

Environmental degradation and hazards are the results of the conditions that pose negative impacts on the healthy natural environment. Releasing pollutants in natural environment and disturbing natural processes through different uncontrolled human activities have caused many serious damages to the environment. It should be

understood that not only natural but also manmade artificial environment is also damaged by this loss of natural environment whether it is direct or in indirect form.

It is now necessary to stop this damage to environment and for this a proper strategy is required because in the absence of a strong base all efforts will be jeopardized and ineffective.

**Environment Management:**

The concept of EVM environment management is one such effort to identify the present environmental problems and find the best solution for them. Environmental management supports welfare of human being along with a healthy environment. It helps to provide a quality life to humans without endangering environment.

**Need for Environment Management:**

**Increasing Rate of Pollution:**

The rise in human population has caused a giant increase in human activities which has increased the human interference in natural environment. Unorganized and uncontrolled human activities are leading towards high release of pollutants in natural environment whether it is air, soil, water or any other resource each vital resource is a victim of pollution in present time.

**Drastic and Unnatural Changes in Nature:**

Natural hazards are getting common day by day the earthquakes, floods etc are more disastrous nowadays. It is not natural but all human organized as many developmental projects are based on economic profits not concerning their natural impacts thus leading towards a fresh manmade disaster. Roads, bridges, buildings are built without concerning the capacity of the geological structure and heavy use of machinery cause fractures in rocks of such regions leading to landslides and earthquakes. Unplanned urbanization leads to the unintentionally invited flood troubles. These are the human errors for which man and nature has to pay accordingly.

**Risk of Extinction of Many Plants and Animals Species:**

Lack of satisfaction is the best curse which has led us to many problems. Man has transferred many plant and animal species from one place to completely different places and sometimes it proves successful and sometimes it fails. Failure is what doesn't matter but success can be in a form of massive destruction of native species who at first lived in their so called environment which is now completely surrounded and captured by the foreign species lending them no merci to exists there thus finally showing them a path of extinction. 'Gajar Ghass' or Parthenium hysterophorus is a weed which is believed to be entered in India near 1956 with the wheat which was imported from USA now has found its way in the middle of the field extracting the nutrients required to grow crops and counted as a major trouble in agricultural fields presently. It poses a great threat to human health too. It has replaced Charota weeds which have medicinal qualities but no longer able to grow freely as its territory has been invaded by 'Gajar Ghass'.

**Heavy Loss to Social and Economic Benefits:**

Not only the natural environment but economy and society have also paying the price of environmental degradation and pollution. One's development is other's loss. If an area is cleared for grazing then it causes massive erosion which leads to sedimentation of surrounding reservoirs and other water sources. If a dam is created for supply of water for agricultural activities or for electricity purposes then it also captures the massive amount of water which was once available for downstream and it effects the livelihood of the fishermen of downstream who once depended on it. The same case has been found in sector 410 which caused trouble for the fisherman of

sector 130 in US. So it is good in form but if taken otherwise it also affects others negatively whether it is economically or socially. Environment management tries to find a middle way to ensure the benefit of both sides.

**Increasing Rate of Environmental Hazards:**

The rate of natural and environmental hazards is increasing. Fast development of infrastructure, unplanned urbanization, uncontrolled agricultural practices, baseless policies and environmental impact ignorance are working forces behind increasing hazards like flood, landslides, earthquakes, forest fires and drought etc.

**To Insure Healthy Environment:**

Environmental management is required to ensure a healthy environment. Environment management supports policies that promote environmentally sound developments which ensure a healthy and better environment for all.

**Benefits of Environment Management:**

- It helps to preserve natural resources.
- Promotes sustainable development
- Ensures social welfare
- Helps to increase economic profits
- Insures a safe and better future for humans and other living organisms
- Helps in providing worthy environmental policies etc.

**Watershed as an Approach for Environment Management:**

Watershed approach is not a new concept but it has been used for many studies. In geography it is one of the most relevant approaches in present time. Watershed approach is also used for resource management, land use and land cover identification, morphometric analysis, forest or soil related studies and water resource management etc. It is firstly required to know about watershed before evaluating its importance as an approach for environment management.

**Watershed:**

Every stream has a drainage basin, which is the spatial geomorphic unit occupied by a river system. It is defined by ridges that form drainage divides; that is, the ridges are the dividing lines that control into which basin precipitation drains. Drainage divide define a watershed, the catchment area of the drainage basin (Lal, D.S., 2009, Christopherson, 1998). This definition explains that watersheds are a geomorphic units and geological formations effects their nature, extent and shape and they can be catagorised as a hydrological unit too because they divides the water in a certain drainage system. Watersheds are also known as drainage basin or catchment area of a river system.

In other words watersheds are the outlined space that delimits a region that drains into any water source whether it is a major river system or a small stream or lake, each has their specifically delimited watershed which holds a special nature in itself with various differences bounded by a drainage system.

The All India Soil and Land Use Surveys (AIS&LUS) of the Ministry of Agriculture, Government of India, have developed a system for watershed delineation. The five divisions of watersheds on the bases of total geographical area are given below:

1. Macro Watershed (> 50,000 Hect)
2. Sub-watershed (10,000 to 50,000 Hect)
3. Milli-watershed (1,000 to 10,000 Hect)
4. Micro watershed (100 To 1,000 Hect)
5. Mini watershed (1 to 100 Hect) (Chandrawati Jee & Shagufta, 2010)

### **Watershed as an Approach:**

Watershed as an approach is a body of techniques that is used for investigation of any phenomena or to get new insights in any field or used for modifying or correlating previous knowledge. An approach is often used to define any natural concept. Watershed as an approach represents a spatial unit for environment management planning implementation.

Watershed approach is hydrologically defined, geographically focused and geologically concerned. This approach includes all influential elements like water and air.

Watershed approach is also supported by many sponsors whether they belong to public or to any private sector on any scale. Watershed approach is a community based idea which has an organized agenda. Watershed approach emphasizes on water resource related issues. It represents a variant environmental space which includes different types of ecological habitats, forests, soils etc so it can be said that many different elements are bounded into one thread named watershed. Using watershed approach integrates many different programs under a watershed region. This approach is based on sound science. Watershed approach includes many strategically plan used for watershed studies and has an applied nature. In this approach management of the entire watershed is given importance. There are five elements generally included when using a watershed approach-

1. Identification of the problems in desired watershed and determine the needs of that watershed
2. Assessing the future results of the programs implemented in watersheds
3. Detecting the project sites
4. Identification of the potential sites for meeting the requirements of watershed
5. Prioritization of project sites

### **Watershed and Environment Management:**

Watershed is a complex unit bounded by a drainage system. The complexity of any watershed depends on its size. A larger watershed is complex in nature than a smaller one. A watershed is region which integrates natural and human resources under one roof. Watersheds have many resources. Environment management tries to ensure a better future to human being along with a healthy environment. The misuse of resources is causing many environmental problems. Watersheds are a perfect unit for the study of water resource related problems but not only this forest, soil and other resource related problems can also be identified in a watershed. There is a concept of watershed ecology related to the watershed studies in which the interaction between human behavior and society to watershed ecology and dependence of human population on watershed ecology is managed. Watersheds are highly affected by human ignorance, resource misusage, over exploitation, and carelessness. A watershed represents many different types of environments from head to mouth and due to different environments they are the habitat for different types of living organs. Each part under a watershed is not same in fertility and not equally usable. Each part of watershed holds a specific characteristic of its own which makes them more or less usable and utilizable. Its each part cannot be used for agriculture, mining and industrial purposes. This specification makes some places dense settled but leaves rest places to be a less populated or barren land. This makes it more complex and environmentally more variant in nature. Watershed ecology concept brings it more close to the environment management related plans. A watershed approach is significant to improving the results of wetland and stream protection and restoration projects.

Following points explain the importance of watershed approach in environment management-

- Watershed approach is time and cost effective. Studying different resources and environmental elements separately in various regions is a time taking and money wasting act where watershed approach presents a perfect framework to study all this in a defined natural unit.
- Integrated management program is based on a single program implementation in a region for different purposes like a single management program for soil, water, forest, agriculture, economy and social development in any region. Watershed approach helps to integrate them all under one umbrella.
- Watershed represents a well defined natural unit for planning which in itself is bounded by a water source thus it is much easier to determine the environmental problems in such region.
- It is easy to get public support for an integrated program rather than having many programs on different scales. A joint program can easily get popular among population and is heartily supported by the habitants of that region. Watershed approach thus presents a better option for public support for environment management related programs.
- Use of Remote Sensing and GIS techniques is very viral in watersheds which enable to collect data much more easily than a field based survey. The data collected through this method is very accurate as it can be checked very easily and quickly whenever required.
- Watershed basically having leaf form, gives well organized area for the survey and planning purposes.

**Conclusion:**

Finally it can be concluded that watershed approach presents an integrated, more effective and less costly option for environment management. It is no wonder that in present time use of watershed approach is highly appreciated. Watersheds which are bounded by a drainage system present a perfect integrated, hydro-geological and geographical region for the Effective implementation of environment management planning.

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