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Point for discussion this month ---

Eternal Words

Till now man has been up against nature, from now on he will be up against his own nature.

- Dennis Gabor

Suburbia is where the developer bulldozes out the trees, then names the streets after them.

~ Bill Vaughn

Modern man talks of a battle with nature, forgetting that, if he won the battle, he would find himself on the losing side.

~ E F Schumacher

Nature knows no indecencies; man invents them.

~ Mark Twain

Dear Readers,

On behalf of SERI team I wish you all a very healthy, peaceful, prosperous and Green New Year 2015!

In 2014 India has seen very positive changes in economy and development due to changes in political scenario. The New Prime minister of India has shown very keen interest in pollution control and restoration of River Ganga. Ministry of Water Resources (MoWR), GoI, a newly formed ministry to deal with water issues is taking some positive steps towards achieving the goals of water security, sustainability and rejuvenation. They are making dialogues and creating platforms such as "Ganga Manthan", "Jal Manthan" to identify local level activities related to water body conservation, preservation and protection.

Thus, India is entering in 2015 with many positive notes. This New Year will surely bring smiles on the faces of 'water worriers' and will bring some good policy changes for our beloved rivers to make them full of aquatic bio diversity and prosper their health.

The semi urban areas in vicinity of any metropolitan city are facing tremendous pressure for development in India. The ever increasing demand for residential complexes puts tons of pollution load on the surrounding environment. If caution is not observed, the solid and liquid waste from these settlements will show grave impact on health of citizens. One such review of the situation around Pune is published in this issue.

The year 2014 was not started on good note for SERI Team as in the beginning we lost our associate, Green Infrastructure's Director, Mr. Probir Sinha to a very short illness. The strong positive energy which he used to carry with him and his devotion for hiswork are the things which we miss the most. We had barely coped with this when the whip of destiny cracked again and threw us in darkness when we lost our mentor, guide, philosopher, pivot, our founder DirectorMr. Sandeep Joshi on 23rd September, 2014. Intelligence, passion and vision he had have played crucial role in establishing SERI as pioneer of Ecotechnology in waste-water treatment systems. 25 years of his relentless work in the field of Eco-technology is well appreciated nationally and internationally. It's been a hardship to tackle this shock. May God endow upon us the strength and courage to work for his passion and fulfill his dreams for sustainable, free flowing, pollution free rivers of his beloved nation.

Thank you,
Chief Editor

Jammu & Kashmir Flood – Warning Alarm of Nature

- Compiled by Pallavi Patil

Located in the northern part of India, Jammu and Kashmir is known as "Heaven or paradise of India" for its marvellous beauty embraced by green hills, snow covered mountains, valley of colourful flowers, and beautiful networking of mountain rivers and lakes. In the first week of September 2014, because of unusually high rainfall,Jammu and Kashmir State battled with devastating crisis of floods. Many places in the Kashmir valley received rainfall of more than 200 mm within 24 hours.

Similarly last year in June 2013, destructive flash flood happened in Uttarakhand due to extreme rainfall of more than 340 mm recorded in short period of time which led to massive land sliding in the area. 13 districts were severely affected, out of which 4 were devastated completely, 5,700 people killed and thousands of people were relocated, more than Rs. 10,000 crores economical losses while immeasurable loss of biodiversity/ecosystem.

Cloud bust, heavy flash flooding and land sliding crises have started to hit India repeatedly. It is an alarming reminder of nature which is pointed towards climatic change and anthropogenic activities

Environmentalists have blamed encroachment of the wetlands and lakes in the valley as the main reason for this devastation because lakes, rivers, riverine wetlands, and streams which play a very important role in controlling flood in the region.

Geographically Jammu and Kashmir (J&K) is divided into 3 regions viz. the plains of Jammu, the Kashmir Valley and the hills of Ladakh As per a report of Department of Environment and Remote Sensing, there are 1,230 nos. of lakes and water bodies in the J&K state out of which 150 in Jammu, 415 in Kashmir and 665 in Ladakh region. The Kashmir valley is scattered with wetlands natural ponds, lakes, rivers, riverine wetlands and streams. The Jhelum, Indus, Tawi, Ravi and Chenab are the major rivers flowing through J&K state. Jammu and Kashmir is home to several Himalayan glaciers

As a part of the project of National Wetland Inventory and Assessment (NWIA) published by Space Applications Centre (ISRO), Ahmedabad and University of Kashmir, Srinagar in 2010, Total 1411 wetlands plus 2240 small wetlands (area <

2.25 ha) are mapped in the state occupying 391501 ha area which comprises two type of wetlands one is Inland-Natural and other is Inland-Manmade.

The Natural wetlands are in dominance in the state occupying around 93.0 % area which includes 36 Lakes/ponds (3.5%), 1143 High altitude wetlands (27.88%), 88 riverine wetlands (2.45%) and 138 River / stream (59.16%) while manmade wetland comprises r mostly 4 reservoirs/Barrages occupies 25132 ha area (4%).

Kashmir valley which is known as the "land of wetlands" also famous lakes likes Sheeshnag, Manasbal, Wular lake , Dal lake, Hokersar, Nilnag, Gangbal, Vaishan sar, Kishan sar, Kausarnag, Khanpur and Waskur located in the Kashmir valley. Large number of lakes are found in the Ladakh region which are mostly originated from glaciers. Tsokar, Tso Moriri and Pangong Tso are main wetland of Ladakh region. These water bodies act as sponge to absorb excess water and control flood in this region.

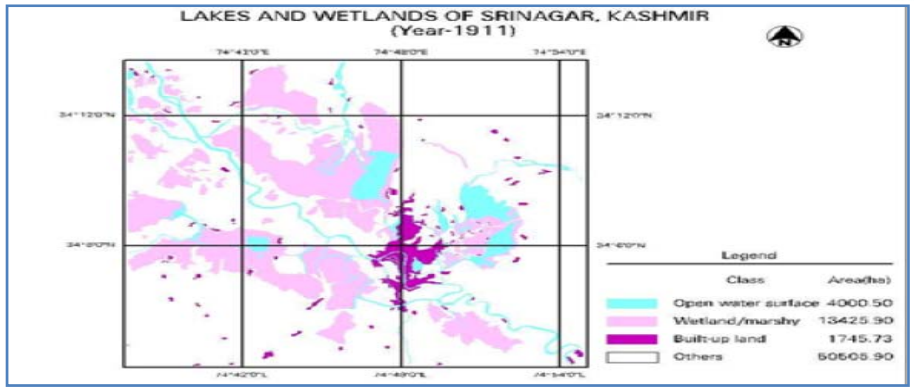
Some of the wetlands in the J&K state are facing major threat due to urbanization. Natural water-bodies in the Kashmir valley are encroached and converted into residential and commercial complexes which led to alteration in the drainage pattern of the area. During rainy season, flooding takes place due to blockages in the drainage system. Alteration in the microclimatic conditions of the Himalayan regions happened due to encroachment on the lakes, river and wetlands. Because of reducing area of wetlands and streams which is inadequate to absorb excess rainwater, flooding situation is created in the region.

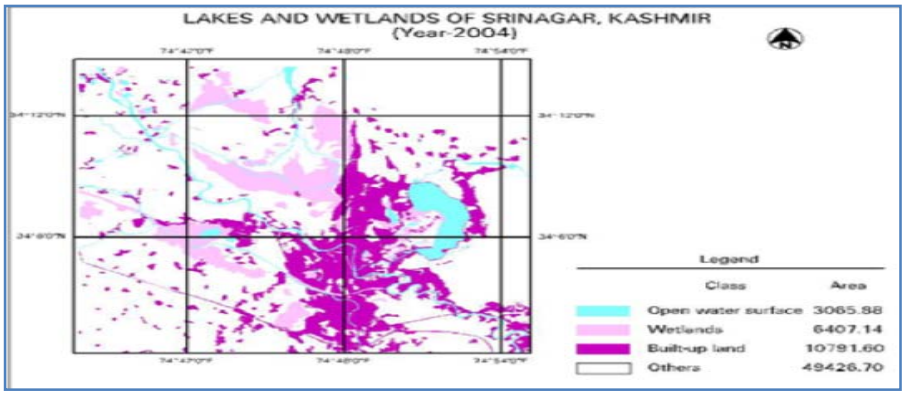
Unplanned growth of residential and commercial area or sometimes encroachment into the catchment area of the water bodies (rivers, lakes and wetlands etc.), undesired changes in land use patterns and deforestation led to excessive siltation in most of the lake and water bodies etc. are some of the main critical issues for environment degradation in Jammu & Kashmir.

Well-known scientist Humayun Rashid and Gowhar Naseem, Directorate of Ecology, Environment and Remote Sensing, published their research paper in 12th World Lake conference held in Jaipur, Rajasthan (I) about "*loss in spatial extent of lakes and wetlands in Srinagar city and its effect on the city using geospatial approach.*"

Comparative studies showed that during period of 1911 nearly 13425.85 Ha and 4000.5 Ha area was covered under marshy area and open water surface respectively while nearly 9119.92 Ha of open water surface and wetlands has been totally lost during the period of 1911 to 2004. It means more than 50% of the lake and wetland area has been lost to other land use pattern/categories. Also studies revealed that there has been tremendous growth in the built-up category which was estimated at 10,791.59 hectares during this period.

Comparative map of Lakes and Wetland area of Srinagar in 1911 and 2004 respectively given as below -





In above map, blue area indicates open water bodies, light pink wetland/marshy land, violet built-up area and white indicates other area.

The studies showed that, Srinagar's natural drainage system has collapsed due to the degradation of the network of lakes. Water from huge catchment area reaches the lake; each lake has its flood discharge channel which drains the spill over. But due to encroachment and excessive siltation, area of water bodies are reduced ultimately it affects carrying/storage capacity of water bodies.

Over the years it has been observed that, two to three days continuous rain in Kashmir valley raises flood threat in the Jhelum River. Two to three decades back, the residential areas which never got flooded is getting flood after continuous rain. This is because wetlands are inadequate to hold the excess water.

After analysis of satellite data published by Rashid and Naseem showed that, Mar nallah is lost due to road, Doodhganga Nallah is converted into residential and commercial buildings, Bemina and Batmalo wetlands are converted into residential colonies. Lake Anchar, Gilsar Lake, Khushalsar Lake and Brar-i-Nambal water bodies which are located in the core area of the city are ecologically degraded due to

excess ingress of pollution load while area of other lakes and wetlands are diminished.

The city was once famous for its traditional ponds and tanks which have been erased to house commercial complexes and parks in the city.

The microclimate data of the Srinagar recorded by meteorological department during past century suggested that, there is a rising trend in the mean maximum temperature during the summer due to loss of water bodies and urban heat islands effect created due to increase in the built-up area in the city.

Comparative analysis of mean monthly maximum temperature during the period 1901-1950 and 1979-1996 shows that mean maximum temperature have increased from 30.8°C to 32.4°C in the month of July in the city. This is supposed to be mainly due to loss of water bodies as microclimate of the city stands altered due to undesired land use change.

It rains for just few days in the year and the remaining period flood plane is relatively dry. Hence now people started constructing residential buildings in the low-line area of river which leads to block and reduce the width of flood channels.

In 2005-06, the department of Irrigation and Flood Control launched a drive to remove encroachers along the Jhelum channel. However, the drive was not to manage the natural drainage of Srinagar but to beautify the river front.

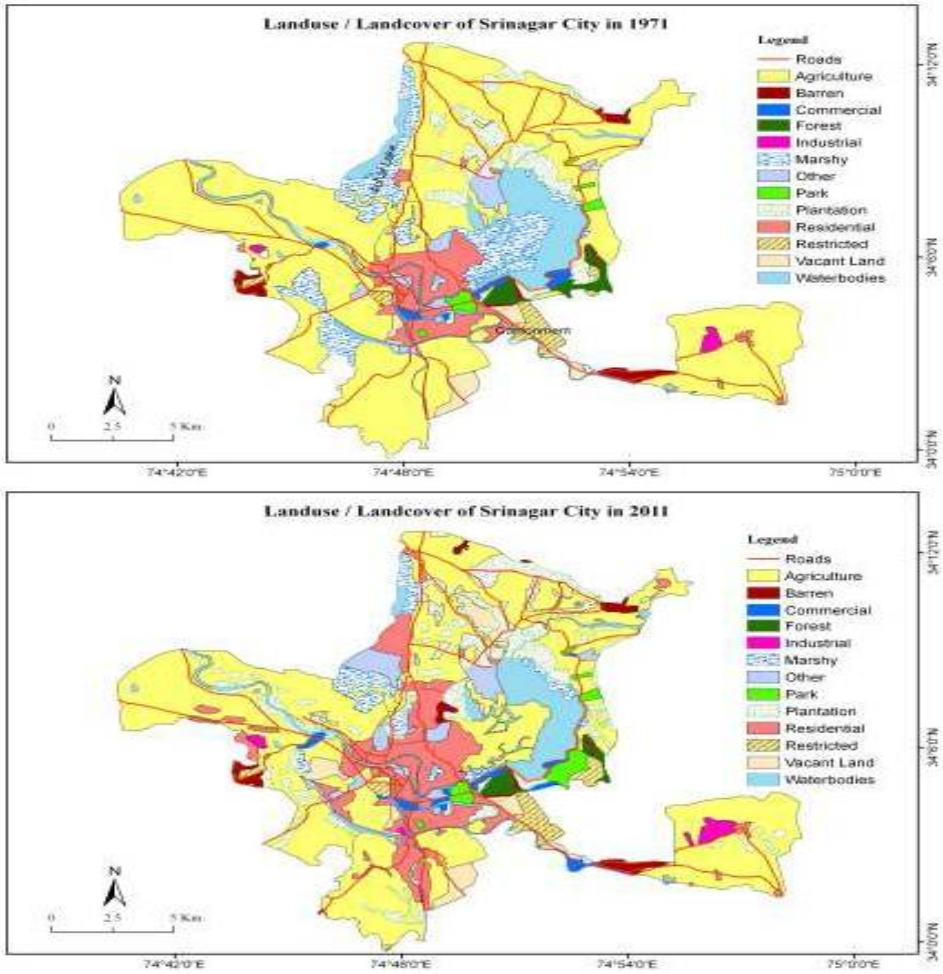
Unchecked deforestation causing soil erosion and silting, human encroachments in and around the water bodies and apathetic attitude and unimaginative policies of the concerned authorities have led to the degradation and shrinking of area of wetlands.

Pune based researchers R. A. Wani and V. P Khairkar published research paper in International Journal of Geomatics and Geosciences about "*Quantifying land use and land cover change using GIS geographic information system: A case study of Srinagar city, Jammu and Kashmir, India*" in 2011.

The studies show that, built up area of Srinagar city has increased from 2556.50 ha and 6626.03 ha in 1971 and 2011 respectively whereas non-built up area had drastically decreased from 20890.00 to 16820.47 ha during the period of 1971 to 2011. It means total built up has increased by 159.61% while non-built up area has decreased by 19.48% from 1971 to 2011.

The land under agriculture has drastically decreased which occupied 61.45% of the land of the city in 1971 to 46.73 % in 2011. Land use/ Land cover of Srinagar city in 1971 and 2011 respectively given as below,

In map, yellow area indicates agriculture land, pink residential, blue water bodies and green indicates forest area.



Due to pressure of urbanization, area of the Srinagar city was 12.8 km² in 1901 which increased to 82.88 km² in 1971 to 270 km² in 2001.

Presently the 1200 house boats inside the Dal Lake and an estimated 9000 metric tons of waste annually disposed directly into Dal Lake. These settlements spill all their wastes into the lakes. This results in increasing levels of solid waste from the peripheral areas and from the settlements into the lake resulting in sedimentation and excessive weed growth.

Change in land use pattern due to urbanization and agriculture etc. affects the physical and ecological properties of the area.

All these studies are pointing figure to the changed catchment of the valley.

How sustainable is our infrastructure development ….???

- Nikhil Sardeshmukh

In modern day urban civilization, providing habitable "shelter" (living infrastructure), to its citizens is considered as one of the most important duties of the local governing body. But population explosion, urban migration, development imbalance and practical limits to the horizontal growth have badly affected the living standards of most of the prominent cities in India, Pune being no exception.

To quote the recent article in TOI by Mr. R. Jadhav about the situation in the Khadakwasla village on the outskirts of Pune, "*Heaps of garbage, the stench of open defecation and clouds of dust greet visitors to Khadakwasla village, which has seen a spurt in illegal constructions in the last few years and manages to attract investors despite its non-existent civic infrastructure. The only amenity, buildings in this village have is electricity*." According to Mr. Jadhav, in this particular area, there are practically no roads, no drains, very fickle supply of potable water, all in all, the surrounding infrastructure is the very exact definition of being " inhabitable" , yet, the infrastructure market in the area is booming like any other part of Pune city as the investors are pouring in, residential complexes/buildings are being set up and despite of all the glitches, they somehow manage to find the people from Mumbai/Pune to invest in such commodities.

The only amenity most of these illegal building can boast of is "Electricity". Analyzing these infrastructural commodities on basis of 5 basic necessities viz, Road, transport, open spaces, toilet and sewage treatment, the current status of these residential units and its surrounding fail miserably on all account. There is absolutely no road connectivity for the many construction sites. Among those which have, many developers have craved the road out of hills and filling in the local small water bodies which is both illegal and dangerous considering the local ecological balance. Even from the human emergency precautionary point of view, many roads are not even wide enough to allow an ambulance or fire brigade trucks to commute freely. As for the local transport is concerned, majority of the areas in this village depended on civic transportation but number of PMC buses plying in this area is very limited, ultimately the larger section of the population is depended on illegal transportation. There are no gardens, playgrounds or any such open spaces in this area. Some builders have created religious structures without the prior approval of PMC and claim to the customers that, the local area will be developed by PMC as per the regional plan. Toilet facility is another big problem in the area and nearby villages. Many of the housing infrastructures have come up with improper, inadequate or absolutely no toilet facilities. Still open defecation is a common practice in many of the nearby villages. And all this lack of proper sanitation is causing several health hazards in the area. In concurrence with the toilet problem, the issue of proper sewage treatment facilities in the surrounding area is also of the major concern. Even the major builders in the fringes have not constructed the proper STPs for their projects. Most of the illegal buildings are releasing the sewage in open or in the nearby natural water body such as river and thus polluting the same. There is an unbearable odour in the nearby area and water body because of this and making it unbearable for the residents of nearby localities.

***Picture courtesy: Times of India (Issue dated December 4, 2014)**

The overall situation observed in this area of Pune city raise many alarming questions over the overall standard of living and sustainability of the so called "infrastructural development" in the region. Villages such as Kondhwe Dhawade have started to resemble slum pockets, albeit in concrete. Sewage water flows on the kutcha roads. "*The situation worsens in the monsoon. Water gushes into the parking and we cannot even come out of our apartments*," says Ramesh Konde, a local resident.

Considering our self pro development and money minded people, it is a high time for all of us to introspect the "cost" of such development. If any development or its aspect isn't sustainable with respect to the local ecology, it will not only be compounding the problems faced by local human population but will also cause irreversible damages to the surrounding ecology. Any development can only be sustainable and long lasting, if both the human activities and environmental activities go hand in hand. So far, in many places like Khadakwasala village, we have and are still causing some serious damages to the local environment in the name of haphazard developmental schemes to sustain the ever so increasing demands of population explosion. Learning lesson from such scenarios, it is a high time for all of us to work out the feasibility and sustainability of such infrastructural "development", before taking off on this nonreturnable journey..!!

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