

How to Bring the Dying Dal Lake to Life?

Nund Rish, the patron saint of Kashmir has a saying: Vethe Hokan Tee Hander Grazan, Teli Mali Assi Wander Raj. (Rivers will dry, Drains will roar; Then My Dear will Monkeys Rule). Many of the old fresh waterways of Kashmir are now used as drains and within the urban areas streams serve as sewers. Kashmir's famous Dal Lake is polluted to the point of being near death as a fresh body of water. There is no disagreement on this point. There are differences on who is responsible for causing the pollution and how to check the deterioration. The Lakes and Water Development Authority of Kashmir (LAWDA) is blamed for its inefficient and corrupt practices. The dwellers in and around the lake are also faulted. The water surface area of Dal is shrinking at an alarming rate due to encroachers converting water surface to land. Raw sewage flows into the lake from surrounding habitations, deteriorating the water quality of the Dal. This Dal debate has raged for four decades, at no avail.

Case in point is the study of the Dal Lake sponsored by the Commonwealth fund. A New Zealand Consultant (Enex Consortium) did a study report on the Dal Lake in 1987. Studying this 30-year old report, a copy of a copy with missing parts and illustrations, and reading the Kashmiri official response to the consultant recommendations and learning of the work done during the last thirty years is proof of the sad but pointed prophesy of Nund Rishi.

According to the Enex Study Report, an estimated 5.5 tons of phosphates and 89 tons of nitrogen annually accumulate in the lake. Enex's finding is that because of the reduction of plant covers on the surrounding hills, soil erosion resulted. Added to this was the increase in agricultural activity in the catchments area and within Dal Lake itself which added even more nutrients to run-off contributed about 70% of the pollution. The direct discharge of sewage from house boats and latrines, a health hazard, contributed about one third of the nutrients. Enex conclusion is that by stopping the nutrients entry into the lake the water quality of the Dal can be restored.

The Enex report recommended measures to control the use of land within the Dal catchments area, with the goal to reduce the nutrients entering the lake from catchments. In the immediate Dal Lake vicinity proposed measures were to divert sewage and separate and seal off polluted water inflow to the lake from the floating garden areas.

Specific recommendations included:

1. Restore the ground cover in the Dal Lakes catchments area by reforestation and control grazing.
2. Construct a water basin to arrest bulk of the sediment and insoluble nutrients entering the lake from the north side, from Telbal Nalla.

3. Extend the existing Boulevard road to the western side of the lake to define the shoreline of the lake and dredge out the northern end of the lake.
4. Separate the floating garden area from the lake's open water areas by constructing an earth bund extending from Dal Gate to Nehru Park then to Kotar Khana continuing to the North West towards the Engineering College and Hazratbal. The bund would have locks to allow access but would prevent flow of nutrient rich water from the floating gardens into the lake's open water areas.
5. Build trunk sewage and electric and water pipes on the proposed bund for connections to house boats.
6. Rearrange the mooring area of the houseboats along the new bund to improve visual appeal and improve water circulation.

The above measures would stop accumulation of nutrients in the lake and over time provide a net loss of nutrients that would in turn curb weed growth and thus improve the water quality. The Enex report provided cost estimates and based on analysis deemed the proposed improvements economically feasible.

In 1977 the Enex Consortium report was submitted to the Kashmir government. The government had a committee of "experts" review the report. Following are summarized committee comments:

1. The "experts" blamed erosion in Dachigam area to the nomadic Banyarees and Dudi Gujares "who carry their cattle and live stocks to the high pastures during the summer months". The committee wanted to fence "all around" to prevent the entry of the nomads and their cattle into the upper reaches of Dashigam.
2. The Enex proposal was for the settling basin surface area of 150,000 sq meters, storage depth of 1.50 meters, to provide a detention time of 20 minutes for a peak flow of 2000 cusecs of water flow. The committee wanted to limit the basin area to 20,000 sq meters and increase the depth to 4.00 meters "(B) because of the paucity of land".
3. Enex proposed sewer pipes along the bund, laid "flat" level on the bund and connected to house boats with flexible pipe. The sewer removal would be gained by flushing at regular intervals. The committee comment: "it is felt that pollution of the lake as a result of entry of sewage, surface drainage or storm water from different direction, can not be regulated unless full-fledged integrated and long term facilities of sewage and drainage are provided in the the city of Srinagar".
4. The Consultants proposal to build an earthen bund to segregate the clear water areas of the lake from the floating gardens was not deemed acceptable. The

committee lamented on forsaking a large portion of the historic water surface of the Dal.

The Enex Consultants in its response doubts practicability and effectiveness of the Committee recommendation.

The floating gardens float no more. The area has very limited free water surface, except in the very shallow - less than 1 meter deep - channels. Enex pointed to the difficulty and cost of disposing of the dredge material, and also the social disruption of large number of displaced families to be accommodated. In addition, the loss of vegetable production from the floating gardens would be difficult to recover from other sources. The question of water quality, pollution and the nutrient balance, was to be the focus of Dal rehabilitation, Enex pointed. The development projects must therefore be to ensure that the nutrients are contained behind an effective barrier and released only near the outlets of the lake, and that the houseboats be confined to areas of easy access near the lake outlet where incidental pollution would be swept out of the lake.

Arguments of the "expert" Committee seem like utterance of arrogance of power and ignorance of the powerful. How else can one explain the Committee recommendation to fence "all around" the Dachigam catchments area, with no regard to the nomads who eked out a livelihood grazing their cattle. How else do you explain arguments rejecting economical and physical viable suggestions for a sewer that would provide for sanitation of the house boat area of the Dal Lake, and instead insist on an impossible "full fledged integrated" sewage and drainage system for all of Srinagar City. The Committee wanted to convert all of Srinagar, a city with medieval infrastructure - there is no sewerage in the city anywhere - into a modern metropolis in one instant, no matter the cost or consequences. And then how do you explain on one hand arguing "paucity" of land for creating an adequate size settlement basin for trapping the nutrient rich eroded soil and on the other hand ask to "eliminate" the most productive agricultural land in Kashmir and a community that cultivates the land. The floating gardens of the Dal Lake produce four vegetable crops a year and the humus soil of floating gardens is ten times more productive than regular soil. There is "paucity" of such land in Kashmir.

Dal Lake is a shallow depth - generally averaging two meters - water body surrounded one side by terraced gentle slopes at the base of mountains which rise up to 1000m above the lake level. The Dal Lake catchments area about 300 square kilometers is fed by springs in the lake bed and streams around the shoreline. Telbal Nulla which drains the large valley, Dachigam enters the lake from the northern end. From the south side Dal is part of a series of bodies of water including Nagin and Nchar Lakes and River Jehlum. River Jehlum drains Srinagar City, spread for the most part on the south end of the lake. Srinagar city itself could be considered as a city made of islands. Dal waters flow out to join Jehlum at Dal Gate, at the south-west corner into channel at Chinar Bagh. On the north side via Nagin Lake and canal Nalla Amir Khan Nalla, Dal flows into Anchar Lake.

The Dal itself is separated into three sub lakes, Hazratbal, Bod Dal and Gagribal by the man made bunds. Nagin Lake is separated from Dal Lake by a narrow strip of land and a causeway which has been bridged.

The Enex proposal to separate the clear water area from the agricultural area by a bund is an effective means of arresting the future deteriorating of the lake. The bund will have a place to provide sewer. And thus handle one of the main factors contributing to the pollution of the lake from the pressure of human settlement along its shores and within the lake basin.

As the Enex study concluded, the key factor of the present state of Dal Lake is the continuing deposition of nutrients in the sediments. Thus the management of the Lake's catchments area is essential. Extensive tree cover in the forest in the hills and mountains surrounding the lake and the planting of more gardens and bush lands would create a natural environment that would help improve quality of the lake water.

Among the official circles of Kashmir the focus is on encroachments. Illegal encroachments rightly are a legitimate concern; encroachments are a legal matter to be dealt in the courts. However, it is evident from the Enex recommendation that the general elimination of encroachments has little bearing and continued deteriorations of Dal Lake. The Enex proposal for the bund is a rational means of making the present floating gardens area into an improved asset. The proposed earthen bund would itself add a unique esthetic element to the Dal landscape, complimenting the Boulevard along the north shore of Dal Lake.

Building on the Enex proposal, imagine the earthen bund, as a pedestrian promenade with restricted vehicular entry along the southern shore of Dal waters from Dalgate to Hazratbal, complimenting the boulevard on the north shore. Imagine this bund lined with weeping willow, cherry and almond trees. Imagine the houseboat clusters around lotus gardens on one side of the bund; and on the other side more lotus gardens as a foreground for a flourishing Malyari community among gardens of vegetable and flower crops.

There is an information gap between the Dal dwellers and the concerned governmental agencies, each blaming the other while conditions continue to worsen. It is essential to bridge the gap and restoration of the Dal Lake is possible only if the Dal dwellers are involved in the planning and improvement process.

Proposals that focus attention to identify issues that need to be resolved and then give measurable program steps to resolve these issues and show progress on the ground: actual improvement in the Dal Lake environment.

There is obviously more than one way of addressing issues. I myself have spent a life time working on revitalizing blighted areas for the most part in under served communities. I believe your effort needs to be cast in a systematic manner to give the

residents of the area and the government agencies a recognizable joint working arrangement to address issues in a cooperative manner.

I suggest the following 7 tasks as a process to breath life to the dying lake:

- (1) Identify the Dal Lake impact area. Mountain ridge line (water catchments area of the lake) may be a good starting point.
- (2) Summarize studies done to date, identify findings and recommendations including similarities and disagreements.
- (3) Identify existing stake holder groups including stakeholder physical boundaries (Muhallas) within the impact area.
- (4) Organize and hold stakeholder meetings at two levels. At local area level and then at impact area wide level.
- (5) Explain information and receive public feedback at the stakeholder meetings.
- (6) Identify immediate action tasks to improve the lake environment (cleanup, removing blighting influences)
- (7) Develop a community consensus program for immediate implementation and a long range program.
- (8) Continue to hold regular public meetings to keep the stakeholders informed.

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