Dal Lake
The Myth, Perceptions and the Realities
(Area & Weeds)

By Er. Basharat J. Kawoosa

J&K Lakes and Waterways Development Authority Srinagar
Introduction:

Dal Lake, the famous lake of Kashmir in Srinagar City as its jewel is situated in the heart of City between 34°06'N & 34°10'N latitude and 74°05'E & 74°05'4'E at an elevation of about 1583 Meters from mean sea level. Historically the lake has been the centre of Kashmiri Civilisation since BC era. This lake is the main tourist attraction within the City for its uniqueness of staying in Houseboats, the Shikara rides and the floating gardens. The lake is a major source of vegetable supply to the city apart from production of fish. Large quantity of Nadru (Lotus Stem) and vegetables are cultivated within the lake in water, on land masses and floating gardens in addition to fish production for human consumption. Raw water from the lake is lifted for two of the City’s water treatment plants at Nishat and Pokribal and after treatment supplied as potable water. On an average about 45 MLD water from the lake is used after treatment for human consumption. Water Lily in the lake when in bloom is a marvellous sight and its stems and leaves are used as fodder for the cattle.

The lake is a vibrant water body as an important repository of biodiversity with importance for its tourist attraction, flora & fauna and the fresh vegetables.

The Myth, Perceptions and the Realities

(Area & Weeds)
The concerns & myths:

The lake is usually discussed for its size, perceived to have reduced; the quality of water, perceived to have deteriorated; presence of weeds, perceived to having been absent; the houseboats and the dwellers living in hamlets within, perceived to cause pollution and the Shikaras perceived to litter and so on. It is perceived that the lake used to be vast in area with figures being quoted anywhere between 50 and 100 Square Kilometres and even more and now having shrunk to about 13 Square Kilometres. It is also being discussed and believed that the lake was a weed free lake full of crystal clear water within its expanse.

The Lake together with its distinct part, the Nigeen Lake, is certainly under threat and pressure on account of increase in population living around it, in its catchment, within in its hamlets or in houseboats, the urbanisation around and its fallout. The issues of pollution being caused by habitations within and around the lake, on ground or in houseboats and shikaras have been dealt in detail vide different studies and projects under implementation for restoration and preservation of the lake. However the shrinkage in size of the lake and absence of weeds seem to be myths.
The Area of lake:

The dependable sources for the size and area of the lake would be either revenue settlement record or the geographic survey maps. It is revealed in the book “Valley of Kashmir” published in 1895 AD by Sir Walter Roper Lawrence who served in Indian Civil Service in British India and was the first Settlement Commissioner of Kashmir (1889 to 1895), that the area of the lake was 9.9846 Square Miles (25.86 Sq. Kms.) with 7.0346 Square Miles (18.21 Sq. Kms.) as water and 2.95 Square Miles (7.65 Sq. Kms.) as land mass, fixed cultivation, habitations, dembs etc. The old survey maps those are available date back to 1859-60, 1911 and 1924 AD. These maps are available on internet from the collection of Marc Aural Stein a Hungarian British Archaeologist published by John Murray London.

Map-1
Srinagar 1859-60
Map-3
Srinagar 1924
Looking at the maps, the detailing and colour coding has evolved to better from older to latest and the map of 1924 AD is obviously a better choice for a comparison. The map when compared to the present day Maps / Satellite images is matching with existing land marks and therefore a reason to geo reference it. The earlier map does not show a marked difference between clear waters, marshy land, numbal, demb etc. While as the later ones are better detailing them differently. It is interesting to note the existence of distinct water basins in the lake like Gagribal, Bud Dal, Lokut Dal, Dal Kotwal, Suderbal and Sudrakhun (Nigeen). These basins are markedly separated by land masses, marshes and floating gardens. The very existence of these distinct names is suggestive of Dal Lake being a cluster of these distinct clear water basins interconnected with channels and marshes.

A road has existed from Chowdary Bagh on western side upto Ishber on North East side. A branch to this road has got added between 1911 and 1924 on eastern bank south of Nishat Bagh. Part of the original road beyond branch point to Ishbar no more exists now but its reminiscent can be very well seen from present day Google images. Land masses (Malyari) along with small habitations have existed right from Kohnakhun on South along its eastern boundary upto Saidakadal Ashai Bagh and from there along the bund road upto Nandpur, Malpur (Dole Demb). The central portion of Dal Lake on both sides of bund road has been having a dense presence of floating gardens, marshes and malyari land. This is clear from the four maps (Map 1-4), the art work (Art 1-2) and the photograph (Photo-1). The photo (Photo-1) is obviously taken from north side of lake from within the lake across the bund road in the direction of Shankara Acharya (Takhti Sulaiman).

Map-4

(Year not known. Should be between 1911 & 1924)
LAND USE OF DAL-LAKE ON DIGITIZED IMAGE OF MAP 1924
### LEGEND

**Landuse**

- Orange: Built-Up
- Blue: Water Body
- Light Green: Wetland / Nambal
- Green: Floating Gardens
- Dark Green: Gardens / Malyari land
- Gray: Road Network

### Landuse Analysis

<table>
<thead>
<tr>
<th>SNO</th>
<th>LANDUSE</th>
<th>AREA (Sq.km)</th>
<th>PERCENT(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WATER BODIES</td>
<td>12.436</td>
<td>50.83180893</td>
</tr>
<tr>
<td>2</td>
<td>WETLANDS / FLOATING GARDENS</td>
<td>7.869</td>
<td>32.16431617</td>
</tr>
<tr>
<td>3</td>
<td>GARDENS/MALYARI LAND</td>
<td>3.33</td>
<td>13.61138142</td>
</tr>
<tr>
<td>4</td>
<td>ROAD NETWORK</td>
<td>0.26</td>
<td>1.062742634</td>
</tr>
<tr>
<td>5</td>
<td>BUILT UP</td>
<td>0.57</td>
<td>2.290899882</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>24.465</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Source:** Internet

**Prepared For:** Lakes and Waterways Development Authority (Srinagar)
The Lake as surveyed using Electronic Total Station by the Deputy Commissioner Srinagar in 2009 AD suggests the total area of lake as 49432 Kanals 18 Marlas (25 SqKm) with water surface as 39226 Kanals (19.83 SqKm) and 10206 Knals 18 Marlas (5.17 SqKm) as land mass, cultivation etc.

The Satellite image of 2009 got from National Remote Sensing Department (GOI) and analysed by Department of Ecology, Environment and Remote Sensing (J&K) had revealed total area of lake as 25.76 SqKms with the breakup of 20.21 SqKms as water and 5.55 SqKms as land mass, cultivation etc.

The digitized image of 1924 map (courtesy: Town Planning Organisation Kashmir) using computer software reveal that clear waters have been only 12.44 SqKms (50.83%) of a total area of 24.465 SqKms. Numbal/wetlands have been 7.87 SqKms (32.16%). Gardens/Malyari land has been 3.33 SqKms (13.61%). Road Network 0.26 SqKms (1.06%) and the built up area as 0.57 SqKms (2.33%). The gross breakup of water and watery area as such would add up to 20.305 SqKms (83%) and land mass as 4.16 SqKms (17%).

The Satellite Image of 2013 as analysed by Department of Ecology, Environment & Remote Sensing reveals that the total area of the Lake is 24.789 SqKms. (Map- D2). The areas under different land uses have been shown as:

1. Open waters/ with submerged vegetation: 11.88 SqKms
2. Water body with floating/emergent vegetation: 7.077
3. Water body with Roadhs/ Floating gardens: 1.527
4. Water body with Houseboats: 0.358
5. Shikara Ghats: 0.009
   a. Sub Total of Water and watery Surface: 20.851 SqKms

6. Plantation: 0.621
7. Transportation/Road : 0.161
8. Built up: 1.061
9. Vacant land with or without vegetation: 0.278
10. Cultivated Land: 1.816
11. Water Supply Plant: 0.001
   b. Sub Total Land Mass: 3.938 SqKms
   c. Total Area: 24.789

Grossly the water and watery surface as such would add up to 20.851 SqKms (84.11%) and the land mass as 3.938 SqKms(15.89%). However this calculation is at variance with that of area of 1924 AD and 2009 AD mainly on account of exclusion of land mass areas of SKICC, Hazratbal, NIT, Saderbal which were included as area of lake / land mass.

Since the boundary of the lake on east and north are towards hill side, an increase of any substantial area had to be therefore on south and west sides with a raised water level. The historic structures like Hazratbal Shrine with its lawns having existed now for centuries together this expansion would not have been there in the recent historical past. The existence of Shalimar Channel on north would again limit the boundary of open waters to the present day Northern Foreshore Road though the areas from there upto Telbal have been shown previously as marshes and dembs alongwith some habitations. On the basis of comparison of map of 1924 and image of 2013 there is a small increase of 0.324 SqKms in overall area of the lake (areas of Hazratbal, NIT, SKICC and Kohnakhan excluded). There is an increase in water expanse by 0.546 SqKms from 20.305 SqKms to 20.851 SqKms and a reduction in land mass by 0.22 SqKms from 4.16 SqKms to 3.938 SqKms. However there can be an element of slight error because of scale of the map and the pixel size. The reality remains that a significant amount of land mass has been retrieved from the lake from opposite Nishat Bagh area and along Northern Foreshore Road. A hamlet of fishermen from NFR stands fully dredged out and added to water expanse. A number of photographs showing the dredged out areas are given in the end.

It can as such be fairly concluded that the perception of lake having been of the size of even more than 30 SqKms is a myth and not a reality.
The extent of mapping does not represent the legal boundary of the lakes. The area figure depends on the seasonal variability as same keep on changing due to dynamics of phenology and water spread.

Prepared for: Lakes and Water Ways Development Authority, Srinagar

P-18 Dal Lake

The Myth, Perceptions and the Realities

(Area & Weeds)
Fishermen colony at Habak dredged out and dwellers rehabilitated outside lake resulting in addition of water expanse.
Increase of water expanse by dredging out land masses.

Before Dredging

After Dredging

Before Dredging

After Dredging
Before Dredging

After Dredging
AQUATIC VEGETATION / WEEDS:

The lake is part of a natural ecological system and all the components are interlinked and interdependent similar to a water cycle. The lake receives perennial high altitude glacial melt and runoff from a catchment spread over more than 350 Sq Kms.

Photo-1  (1895 AD)
As a result the eroded soil reaches in the shape of sediments to the lake bed where it gets deposited as a nutrient source and is a constant natural process of reduction in depth of the shallow lake. The Aquatic Vegetation present in the lake up-takes / consumes these nutrients and in return produce oxygen and also provide habitat to the fish. The Aquatic Vegetation are practically the breathing lungs for the lake and have existed since ages and must exist. The quantum of vegetation required in balance are essentially required to be present for sustenance of the lake ecosystem. The vegetation when crosses the limit of requirement is then called a weed or an unwanted vegetation.

It can easily be concluded that a weed free lake would be a destruction and an end to the lake eco-system. Dal/ Nigeen is basically a temperate, macrophyte rich, shallow water lake.

**Art-1** (1851 AD)

**Art-2**

(Date not known)
A Foreign Model in Dal Lake in 1960's.
(Aquatic Vegetation / Weed present then)
Source: Facebook