Best Practice of Rainbow Trout Farming

in

Himachal Pradesh

By: Khem Singh Thakur Assistant Director Department of Fisheries Himachal Pradesh.
Attempts to introduce Trout in Himachal were made during 1909 with the transportation of eyed ova of Brown trout from Kashmir to Mahili Hatchery near Patlikuhal Kullu district and the fingerlings so produced were stocked in the river system of Kullu Valley.

Further a consignment of 5000 eyed ova were brought from Kashmir and the progeny so produced on attaining sexual maturity were bred successfully and fry produced were stocked in the streams of Chamba, Manadi, Shimla and Kinnuar Districts of Himachal Pradesh.

Farm with indoor hatchery was established at Patlikuhal and seed produced was stocked in river Beas and its tributaries till 1991;
During late eighties, a bilateral project on commercial trout farming was signed with following targets for transfer of the technology to the state from Norway.

I. Establishment of modern trout hatchery in Kullu valley, capable of producing fingerlings normally required to produce 10 tonnes of table sized fish annually;

II. Installation of feed mill and formulation of economically viable artificial dry feed;

III. Training of project staff and local farmers to take up trout farming in a commercial way.
Fisheries Resources of Himachal Pradesh

General waters (Rivers) – 2400 km
Trout Waters (Streams) – 600 km
Reservoirs 5 No. – 43785 ha
Ponds – 800 ha
High Altitude Lakes 232 No. – 617 ha
Trout Raceways – 762
Highlights of Himachal Fisheries

One of the highest per kg price of the fish of Pong Reservoir
- 2018-19 – Rs. 251.00 per kg

Trout farming in private sector
- No. of Trout Units - 762
- No. of Trout Growers - 366

Promotion of Angling in the state
- No. of Anglers visited during 2018-19 – 6181

No. of Fishermen = 11864
No. of Fish farmers = 1539
Total Fisher folk = 13413
Agreement signed between Norway & India for commercial trout farming in Kullu District of H.P.

1991 - Infrastructural works completed by March & import of eyed ova of Rainbow trout

March 1992 - Another consignment of 1 lakh eyed ova was imported and first sale of table size trout

1997 - Trout farming introduced in private sector

Presently 366 trout growers with 762 trout units across the state.
DEPARTMENTAL TROUT FARMS

Patlikuhal Distt. Kullu
Barot Distt. Mandi
Holi Distt. Chamba
Dhamwari Distt. Shimla
Sangla Distt. Kinnaur
Hamni Distt. Kullu
Thalla, Bharmour Distt. Chamba
• **Trout Fish Patlikuhal:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Total area of the farm</td>
<td>2.2 Ha</td>
</tr>
<tr>
<td>II. Trout Race ways</td>
<td>16</td>
</tr>
<tr>
<td>III. Angling lake</td>
<td>1</td>
</tr>
<tr>
<td>IV. Training Center</td>
<td>1</td>
</tr>
<tr>
<td>V. Aqua Shop</td>
<td>1</td>
</tr>
<tr>
<td>VI. Fish Pathological Lab</td>
<td>1</td>
</tr>
<tr>
<td>VII. Trout Feed Mill</td>
<td>2</td>
</tr>
</tbody>
</table>

(But unfortunate during Sep/2019, the flesh flood in the area washed away the water supply of the farm causing heavy fish mortality in the farm.)
Trout farming in the state

• Initially farmers of the state adopted commercial farming in Kullu near Patlikuhal during early nineties.
• The technology of trout farming has now disseminated to the farmers of the state successfully.
• Farmers of the state has been assisted for construction of trout raceways and 1st year inputs under various central sponsored schemes.
• Department of Fisheries Govt. of Himachal Pradesh is promoting trout culture in the state by providing fish seed and feed to the farmers.
• Farmers of the state are getting remunerative price of Rs. 450/Kg for their produce.
**trout farming**

- Department of fisheries Govt. of Himachal Pradesh is providing trout fish farming training camps for the farmers in different parts of the state to promote the trout culture.
- Practical training has been imparted to the Fish farmers at trout fish farm including hatchery management.
- Department of fisheries has given more emphasis on the cluster approach to promote trout fish farming in the state and trout feed mill and hatchery has been given for each cluster.
- Financial as well as technical assistance are given to the farmers under Blue Revolution schemes.
TROUT FARMING IN PRIVATE SECTOR

TROUT UNITS = 762
TROUT GROWERS = 366
TROUT PRODUCTION DURING 2018-19 = 560.10 MT
VALUE OF TROUT = Rs. 2520.45 Lac
Skill development Programme for Trout Farmers
<table>
<thead>
<tr>
<th>States</th>
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<tbody>
<tr>
<td>Bhutan</td>
</tr>
<tr>
<td>Uttrakhand</td>
</tr>
<tr>
<td>Sikkim</td>
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<td>DCFR, Bhimtal</td>
</tr>
</tbody>
</table>
TROUT SEED STATISTICS (In Lakh)

- **Ova produced**
- **Fry produced**
- **Seed stocked in streams**

<table>
<thead>
<tr>
<th>Year</th>
<th>Ova produced</th>
<th>Fry produced</th>
<th>Seed stocked in streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>11.11</td>
<td>7.12</td>
<td>0.93</td>
</tr>
<tr>
<td>2015-16</td>
<td>11.536</td>
<td>14.27</td>
<td>1.1</td>
</tr>
<tr>
<td>2016-17</td>
<td>16.31</td>
<td>13.67</td>
<td>0.41</td>
</tr>
<tr>
<td>2017-18</td>
<td>16.157</td>
<td>5.93</td>
<td>0.342</td>
</tr>
<tr>
<td>2018-19</td>
<td>18.027</td>
<td>14.576</td>
<td>0.203</td>
</tr>
</tbody>
</table>
Department of Fisheries Himachal Pradesh is pioneer in Trout culture and in a position to supply fish seed as well as feed to private growers and other states/institutions.
## ACHIEVEMENTS OF GOVERNMENT/PRIVATE TROUT FARMS

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fish produced at departmental farms (M.T)</td>
<td>14.19</td>
<td>17.63</td>
<td>18.78</td>
<td>10.53</td>
<td>8.343</td>
</tr>
<tr>
<td>2</td>
<td>Value of fish produced at departmental farms (Rs. In Lakh)</td>
<td>49.67</td>
<td>61.69</td>
<td>84.50</td>
<td>47.39</td>
<td>37.55</td>
</tr>
<tr>
<td>3</td>
<td>Fish produced in private sector (M.T.)</td>
<td>337.08</td>
<td>399.60</td>
<td>415.65</td>
<td>446.20</td>
<td>560.10</td>
</tr>
<tr>
<td>4</td>
<td>Value of fish produced in private sector (Rs. In Lakh)</td>
<td>1179.78</td>
<td>1398.60</td>
<td>1870.43</td>
<td>2007.90</td>
<td>2520.45</td>
</tr>
<tr>
<td>5</td>
<td>Revenue earned from departmental Trout farms (Rs. In Lakh)</td>
<td>114.66</td>
<td>120.96</td>
<td>141.34</td>
<td>129.75</td>
<td>118.22</td>
</tr>
<tr>
<td>6</td>
<td>Angling licences issued (Number)</td>
<td>2200</td>
<td>2400</td>
<td>2470</td>
<td>2724</td>
<td>3191</td>
</tr>
</tbody>
</table>
A feed mill with 300kg/hour capacity was installed at fish farm Patlikuhl during 1991 and another feed mill with 500 kg/hour capacity was installed during 2011;

Main ingredients are fish meal, whole wheat, de-oiled soya cake, yeast, fish oil, vitamin premix, DL-methionine, Choline chloride and mineral mixture. Protein content varied between 41-53%;

Manufactured feed has high stability, better acceptance and desired conversion value of 1.5:1;

More than 100 M.T. feed is being produced at trout fish farm, Patlikuhl annually and production cost ranges between Rs. 100-120/-per kg.
CHEMICAL ANALYSIS (in %) OF DIFFERENT TYPES TO TROUT FEED

<table>
<thead>
<tr>
<th>Type</th>
<th>Proteins</th>
<th>Fats</th>
<th>Carbohydrates</th>
<th>Fibre</th>
<th>Ash</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Feed I</td>
<td>53</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Start Feed II</td>
<td>49</td>
<td>13</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Production Feed</td>
<td>46</td>
<td>9</td>
<td>16</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Brooder Feed</td>
<td>45</td>
<td>18</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>
Angling in trout waters is permissible from 1st March to last day of October every year as the period from November to February, being the breeding season of trout is closed for angling;

**Angling license** can be availed from all departmental offices or online from departmental website [www.hpfisheries.nic.in](http://www.hpfisheries.nic.in) and is issued on daily basis @ Rs. 100/- per day per fishing rod. There is also a provision of annual license @ Rs. 8000/- per year.

**Angling Lake**: An angling lake has been constructed at Patlikuhl over an area of 1775 sq.m with an aim to provide assured fish catches to the anglers.
Department has created staying facility to the anglers at Barot Distt. Mandi, Patlikuhl and Hamni Distt. Kullu, Sultanpur and Holi Distt. Chamba, Pong Dam Distt. Kangra, Kangra Distt. Kangra and Ghagus Distt. Bilaspur in addition to the other department’s rest houses and tourist lodges of HPTDC.
Trout Fish Farm Patlikhal
DISINFECTION OF SPENT BROODERS
SPENT BROODER RETURN BACK IN BROODER TANK
RAINBOW TROUT EYED OVA
HATCHING OF EYED OVA
ALVIN FORMATION

ONE DAY OLD ALVIN SPHERICLE YOLK SAC

THREE DAY OLD ALVIN YOLK SAC ELONGATED
ALVIN FORMATION

ONE DAY OLD ALVIN SPHERICLE YOLK SAC

THREE DAY OLD ALVIN YOLK SAC ELONGATED
ALVIN GROWTH

ALVIN WITH 80% YOLK SAC

ALVIN WITH 70% YOLK SAC
SWIMM UP FRY'S IN HATCHING TRAY
FRY IN STARTER FEEDING TANKS
FRYS IN NURSURY PONDS
HEALTHY FISH FOR MARKETING
TROUT HARVESTING
TROUT TRANSPORTATION

During winter in Drum

During summer in tharmocol