INTRODUCTION:

In Uttarkashi Uttarakhand, there are a number of rivulets flowing parallel to the terrains with wide range of catchments area in its course. These ever-flowing water resources can be utilized for electricity generation through fish poultry farming indigenous Ghari and with model as given by Central Institute for Fisheries and Aquaculture (CIFA) for employment generation through appropriate S & T inputs.

In hills, heavy industrial development is not possible and feasible due to its tough topography and demography. To develop employment for ever-growing population is only resource based activities with the input of appropriate science and technologies.

The economy-improving programme for villages based on local natural resources can only bring impact in development of rural areas. The sustained and scientific utilization of existing resources with modern science and technology inputs is the only answer to come-up from the developed constrains in the area for unemployment and rusting economies. The transfer and utilization of appropriate technology for optimum use of natural resources can bring the economics sound and stable and can solve the problems of ever growing unemployment. In outer Himalaya, there are a number of rivulets flowing parallel to the terrains with wide range of catchments area in its course. This ever-flowing water resource can be utilized for employment generation by fisheries activities through appropriate S & T inputs.

We had selected two locations at the bank of rivulets RANUKI GAD for economy and employment based fish farming introduction in Uttarkashi district. Different kind and form of palatable grasses, plant species were given to carp fishes. The most common grasses and plant species were local grasses like Arundinalia, Chrysopogon, Dicanthus species and plant species were Grewia oppositifolia, Bombex ceiba, Bauhinia variegata, Zea mays, finger millet and foxtail millets used as feed and fodder for domestic animals. Not only local grasses or plant species were practices, we practiced local food grains viz Wheat, Brassica campestris (mustard) cake, ragi and mandwa with different forms. Fish rearing for employment generation is not a traditional occupation due to lack of knowledge and initiation. Thus, present paper is formulated to utilize resource for economy and employment generation utilizing modern S & T for fish farming through establishing low cost fish farm and integrated Ghari/fish-poultry farm, we had established 2 integrated fish-poultry farm as a demonstration cum production unit for fish farming.

Important exotic fishes Cyprinus carpio communis (Scale carp), Cyprinus carpio nudus (Leather carp), Cyprinus carpio specularis (Mirror carp) were introduced by ua at Ranu ki Gad area of Uttarkashi district since 2001-2003 for income generation and livelihood enhancement from the financial assistance of Department of Science and Technology (DST) and World Food Programm(WFP) and Technical assistance of HESCO Dehradun.

All these varieties are fast growing omnivorous species and posses numerous colors and scale. Their large size and water fouling properties require good management to prevent problem arising.

District Uttarkashi is one of the areas from where major rivers i.e. Ganga and Yamuna have its origin with several snow-fed rivulets that form the major resource for income generation. The major problem to utilize this resource is lack of awareness, knowledge and skill. Second major problem in the area is illegal fishing from these resources and almost all cold water fishes become endangered and if the practice will continue these important fish fauna will disappear in near future. Thus, there is an urgent need to train the local folk for fisheries activities that involve the fish cultivation in their own farms and make the unit multi-faceted for involving more and more families for employment generation. This activity will also help in improving their dietary composition thus solving the mal-nutrition problem particularly among women and children.

Why Fish farming in hills?

In hills, the consumption of fishes and meat is higher. Marketing for products of this unit is not a problem. The previous experience of the myself is very good in terms of marketing. The consumers will take the products from the unit himself. Other market possibilities are Indo Tibet Border Police head quarter, Nehru Institute of Mountaineering (NIM), Border Road Organization (BRO) are big buyers of fishes and meat. So, marketing is not a problem. The groups of beneficiaries that are involved as project partner will be made responsible for marketing and enterprise development. The organization will also help them in marketing, maintenance of accounts, and distribution of benefits to member of group, and deposition of benefits for next year running of the activities and for developmental activities in the villages.

Why Fisheries in Uttarkashi?

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The Common carp is very widely distributed all over the world, and three varieties of fish are known according to Alikunhi (1966). All these varieties are fast growing omnivorous species and possess numerous color and scale. Their large size and water fouling properties require good management to prevent problem arising.

The three varieties of Common carp are:
- Cyprinus carpio communis (Scale carp)
- Cyprinus carpio nudus (Leather carp)
- Cyprinus carpio specularis (Mirror carp)

C. carpio communis is commonly called Scale carp owing to the presence of regularly arranged rows of scales. C. carpio nudus is commonly called Leather carp owing to general lack of scales. C. carpio specularis is commonly called Mirror carp.

It is characterized by the presence of few scales arranged in an irregular pattern or just scattered.

The Common carp can be cultivated under tropical conditions up to an altitude of 1,000 m sl but growth is retarded below 150 m sl and above 600 metre. The optimal water temperature ranges between 20-25°C. Under the favorable conditions, the growth rate is 20-25mm per month (Pandey and Shukla, 2002).


**MATERIALS AND METHODS:**

For the study of lengthweight relationship, the fish Cyprinus carpio communis was procured from Genwla fish pond, Uttarkashi. Fortnightly sampling was carried out from 17th October 2002 to 27th January 2003. The total length of the fish measured from tip of the snout to the tip of the caudal fin and the total length measured to be in cm. The weight of the fish measured with the help of the balance and was taken to be...
nearest gm.

On obtaining the data of the length and weight, the common length-weight relationship was calculated. The linearity of regression was tested by the analysis of variance and the significance of difference by analysis of covariance. The final relationship was expressed logarithmatically by the formula.

\[
\log w = \log a + n \log L
\]

or parabolically

\[
w = a L^n
\]

Where, \( w \) represents the weight in gms.

\( L \) represents the total length in cms.

\( a \) and \( n \) are the constants.

**RESULTS AND DISCUSSION:**

The data of the length-weight relationship of *Cyprinus carpio communis* were studied and analyzed. In the present study, the length ranges were from 17.0 cm to 22.2 cm and weight varies from 60.0 gm to 185.0 gm. A minimum length of the fish was caught during December (17.0 cm) and maximum length of the fish during October (22.2 cm). Minimum weight of the fish caught during October having weight 60 gms. And maximum weight of the fish during November having weight 185 gms. The result of length weight analysis is presented in the table 3.1. In the present case according to the mean fish length the ranges were 18.76 to 19.52 cms. and weight 109.0 gms. to 132.12 gms.

Table 1.0 Fortnightly variations in the length and weight of the *Cyprinus carpio communis*

<table>
<thead>
<tr>
<th>Date</th>
<th>No. of fish examined</th>
<th>Mean fish length (in cms.)</th>
<th>Mean fish weight (in gms.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-10-2002</td>
<td>8</td>
<td>19.38 (± 1.35)</td>
<td>120 (± 34.36)</td>
</tr>
<tr>
<td>12-11-2002</td>
<td>10</td>
<td>19.02 (± 0.98)</td>
<td>113 (± 29.72)</td>
</tr>
<tr>
<td>27-11-2002</td>
<td>12</td>
<td>19.81 (± 1.11)</td>
<td>109 (± 33.35)</td>
</tr>
<tr>
<td>2-12-2002</td>
<td>8</td>
<td>19.42 (± 1.14)</td>
<td>132.12 (± 59.30)</td>
</tr>
<tr>
<td>31-12-2002</td>
<td>8</td>
<td>19.52 (± 1.15)</td>
<td>117.25 (± 22.53)</td>
</tr>
<tr>
<td>14-1-2003</td>
<td>8</td>
<td>19.37 (± 1.40)</td>
<td>120.87 (± 34.02)</td>
</tr>
<tr>
<td>27-1-2003</td>
<td>9</td>
<td>18.76 (± 1.46)</td>
<td>124.44 (± 15.71)</td>
</tr>
</tbody>
</table>

Fig-1.0 Length Weight height

The length-weight relationship in fishes was considered to follow cube law (Allen, 1938) but Martin (1949) reported that changes occur in shape and size as they grow, thus parabolic relationship was considered to be superior by Lecren (1951). On viewing of the graph the relation follow the cube law thus may be considered as an idle fish (Table 1.0 and Fig.1).

However, the length and weight of the fish have a definite relationship. The length and weight of the fish *Cyprinus carpio communis* are positively correlated as there is increase in length and weight vice versa.

**REFERENCES:**


