

THE RAINBOW TROUT FARMING IN THE FOOTHILLS OF HIMALAYAS WITH SPECIAL REFERENCE TO UTTARAEY, SIKKIM

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Abstract-The cold water aquaculture in India is mainly based on rainbow trout farming (*Oncorhynchus mykiss*, Walbum, 1792). It is a prosperous venture in the state of Sikkim as the production of trout yields reach dividend for the local farmers as this fish sold in high price in market nearby. The village Uttarey in west sikkim is located near the foothills of Himalayas near Indo-Nepal border and has cold climate throughout the year and plenty of cold water streams flowing near the village which constitute a favourable place for trout hatching and seed production. The village has a hatchery and several rearing units and a farmer co-operative system. Several national and state level organizations lent helping hands for the development of the trout farming in this region of the state of Sikkim.

Keywords: Rainbow trout, fish farming, co-operative, hatchery, Uttarey

1. INTRODUCTION

The rainbow trout (*Oncorhynchus mykiss*) is a salmonid trout species which are widely distributed in the cold-water tributaries of Asia, Europe and North America (Cho et al, 1991). This fish species was propagated in India by British settlers from Europe in 18th century for sport fishing. The shallow clear torrential cold waters from the tributaries and hill streams of different rivers in the foothills of the Himalayas are ideal breeding and culture grounds for this fish species. This fish species is the ideal source of protein in the hilly areas of Himalayas and it also cater the needs of nearby plains.

1.1. LIFE CYCLE

Rainbow trouts are freshwater fishes inhabiting in coldwater shallow rivers with bedrock gravel bottoms in different streams originating from the high mountains (Cho et al, 1991). These rivers are well oxygenated due to their swift water currents. Some of the rainbow trouts are the resident of deep and cool lakes of the Himalayas with adequate shallows and vegetation to support production of sufficient food sources. These fish populations can be self-sustaining if they get the access to gravelly bottomed streams. The spawning sites of the rainbow trouts are usually shallow bedrock of the hilly streams. Female rainbow trout usually produce 2000 to 3000 4-to-5-millimetre (0.16 to 0.20 in) eggs per kilogram of weight (Tyler et al, 1996). Immediately after the eggs are released by the female, the milt or sperms are deposited by a male trout which moves alongside the female for fertilization of the eggs. The hatching of eggs usually take four to seven weeks. But, this timing can vary with region and habitat. Area, habitat, life history and quality and quantity of food are few of the limiting factors for the growth rate of rainbow trout (Staley et al, 2000). Small juvenile trouts are called fingerlings as they are approximately the size of a human finger (Fig. 4).

2. MATERIAL AND METHODS

Authors visited the village several times in between 2017-2020 and through proper questioning and interview to the local people, documented the results. The information was received from local people as well as from D.F.O., West Sikkim. The study reveals several interesting information regarding the breeding and rearing of rainbow trouts, Uttarey village clusters in Sikkim. This village has a trout growers'

cooperative society with 21 members and is the oldest village of Sikkim so far the history of trout breeding and farming is concern.

flowing water supply from Uttarey river, which is appropriate for trout farming.

3. RESULTS AND DISCUSSION

3.2. TROUT CULTURE PROGRAMME

3.1. STUDY AREA

For production of seeds of both brown and rainbow trouts six trout hatcheries was set up in Sikkim. The hatched rainbow trout seedlings are distributed to the farmers for culture in their private set up. During the year 2015-16, 1.34 lakhs Rainbow trout green ova were produced by the government farms. Upto 249 beneficiaries have been given financial support by NFDB under the scheme of trout culture in Sikkim. With the increase of the number of trout growers in the area, the production has risen sharply in the past few years. In the year 2008-09 trout production in the state was negligible which has increased to 110 MT in the year 2015-16 (Table-I).

In West Sikkim on the northern slope of Singalila range, Uttarey is a small village (27.2606°N, 88.0950°E) situated near the border of Nepal at an altitude of about 6600 feet. Distance from capital city of Gangtok is 140 km and from Siliguri 150 km. This beautiful village has numerous natural beauties along with a valley of herbal plants and plenty of Rhododendrons at nearby hills. Uttarey is one of the popular trekking gateways of Singalila trek and Nepal. This village has abundant cool and free

Table-I: Year wise and district wise beneficiaries covered under trout culture programme supported by NFDB and DFO, Sikkim

YEAR	DISTRICT				TOTAL
	EAST	NORTH	SOUTH	WEST	
2009 - 10	15	12	5	21	53
2010 - 11	30	20	20	36	106
2011 - 12	7	10	8	15	40
2012 - 13	4	11	---	5	20
2013 - 14	8	7	8	7	30
TOTAL	64	60	41	84	249

3.3. UTTAREY TROUT HATCHERY

each of the tank, there are 5 fry rearing units along with four brooder rearing units with a capacity of rearing 200 kg brooders. The Uttarey trout hatchery has the capacity of 1,00,000 eyed ova, and this is yielding at least 80,000 fingerlings, taking into account of 20% mortality (hypothetical). This hatchery accommodated with 12 troughs for egg incubation (Fig. 1-7).

The trout hatchery in Uttarey, receives plenty of perennial water from the nearby streams and Uttarey river. River Uttarey flows through its vicinity towards its downhill, within a distance of approximately 100 meters. This is by and large the largest active farm of the state and it is catering all seeds required by the farmers of the state (Fig. 1). Constructed in 1980s, the trout farm in Uttarey village was renovated in 2012. Upto 1 lakh green ova can be accommodated in a hatchery unit at the farm in Uttarey village. With a capacity of 1 lakh fry in

In village Uttarey, Sikkim there is an actively functioning trout farmers' co-operative. The farmers' co-operative has worked for the betterment of livelihood and trout culture programme at a large by

providing adequate financial assistance along NFDB. It has membership of around 15 household and has total of 21 tanks in it. Mr. R. B. Rai is the present president of this co- operative. Recently they got financial support for construction and establishment of trout hatcheries from DOF under Blue Revolution mission. The co-operative also encourage the selling of fingerlings outside the village and farmers from the different areas of the state (Singh et al, 2007). Sikkim is a state where there is no shortage of water bodies due to its perennial water resources and having a great prospect and potential for trout farming because of the perfect climate for cold water

fisheries. ICAR-DCFR, Bhimtal and NFDB are mainstays for scientific and technical support and financial assistantship (Pandey et al, 2015). In the national scenario, regarding trout farming Sikkim is one of the fast progressing states. The breeding farm in Uttarey provides an ideal platform for the growth of the trout farmers of the village and has the potential to proliferate the farming prospect in the nearby areas of West Sikkim. The trouts cultured and propagated here are being sold at high price in the market which in turn yield lucrative profit margin for the farmers.



Figs.1-7: 1- Trout breeding hatchery and different breeding and nursery ponds in Uttarey, Sikkim, 2- A local farmer is cleaning the ponds in the hatchery, 3 – Treys for rearing of fry and fingerlings, 4- Row of tray with circulating water for the rearing of fry, 5- Small fingerlings inside a rearing tray with vortexing water, 6- Continuous inflow and outflow of water is necessary for proper growth of the trouts, 7- Adult male and female fishes are kept in separate ponds before they attain marketable size

ACKNOWLEDGEMENT

The authors are thankful to the local administration and co-operative for the permission to conduct the survey in the hatchery and Uttarey and surrounding villages.

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