

**DEPARTMENT OF ZOOLOGY
GURU NANAK DEV UNIVERSITY
AMRITSAR**

The Secretary
University Grants Commission,
Bahadur Shah Zafar Marg,
New Delhi-110002

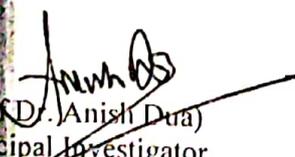
Subject:- Final report of the Major Research Project in Zoology

Respected Sir,

Please find enclosed herewith two copies of the final report of the Major Research Project entitled "**Identification and Conservation of Threatened Fish Species of River Ravi**" F. No. 34-472/2008 (SR) dated 31-12-2008 along with following documents duly signed by the registrar pertaining to the major research project undertaken by the undersigned.

1. Report of the the work done on the project for the peridod 01-02-2009 to 31-01-2012 (Annexure III)
2. Utilizatiuon certificate (Annexure IV).
3. Statement of expenditure incurred during the period 01-02-2009 to 31-01-2012 (Annexure V).
4. Statement of Expenditure incurred on field work. (Annexure VI).
5. Performa for submission of information at the time of sending the final report of the work done on the project (Annexure IX).

Yours' Sincerely


(Prof. Dr. Anish Dura)
Principal Investigator



UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI – 110 002.

Annexure -III

Annual report of the work done on the Major research Project

1. Project report No. 1st/2nd/ 3rd/ final **Final**
 2. UGC reference No. **F.No. 34-472/2008 (SR) dated 31-12-2008**
 3. Period of report: **01-02-2009 to 31-01-2012**
 4. Title of research project – **Identification and Conservation of Threatened Fish Species of River Ravi**
 5. (a) Name of the Principal Investigator **Prof (Dr) Anish Dua**
(b) Deptt. and University/ College where work is progressed
Department of Zoology, Guru Nanak Dev University, Amritsar
 6. Effective date of starting of the project **01-02-2009**
 7. Grant approved and expenditure incurred during the period of the report:
 - (a) Total amount approved **Rs. 7,89,800/- (Received- Rs 6,79,091/-)**
 - (b) Total expenditure **Rs. 6,79,091**
- Report of the work done: (Please attach a sheet separately)
- (i) Brief objective of the project **separate sheets attached (Enclosure IA)**
 - (ii) Work done so far and results achieved and publications, if any, resulting from the work (Give details of the title of the papers and names of the journal in which it has been published or accepted for publication **separate sheets attached (Enclosure IB)**

(iii) Has the progress been according to original plan of work and towards achieving the objective, if not, State reasons

Yes, according to original plan of work

(iv) Please indicate the difficulties, if any experienced in implementing the project

N.A.

(v) If project has not been completed, please indicate the approximate time by which it is likely to be completed. A summary of the work done for the period (annual basis) may please be sent to the Commission on a separate sheet

N.A

(vi) If the project has been completed, please enclose a summary of the finding of the study. Two bound copies of the final report of work done may also be sent to the commission

separate sheets attached Enclosure (1C)

(vi) Any other information, which would help in evaluating of the work done of the project. At the completion of the project, final report should indicate the output, such as: (a) manpower trained, (b) Ph.D. awarded (c) Publication of the results (d) Other impact, if any

separate sheets attached Enclosure (1B)


Principal Investigator


Registrar,
Guru Nanak Dev University,
Amritsar.

Registrar/Principal



ज्ञान-विज्ञान विमुक्तये

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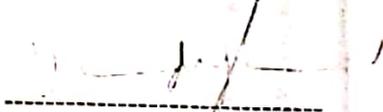
Annexure-IV

UTILISATION CERTIFICATE

Certified that out of the grant of Rs 6,79,091 (Rupees Six lakh seventy nine thousand ninety one only) received from the University Grants Commission under the scheme of support for Major research project entitled "Identification and Conservation of Threatened Fish Species of River Ravi" vide University Grants Commission letter no. 34-472/2008 (SR) dated 31-12-2008, a amount of Rs. 6,79,091/- has been utilized for the purpose for which it was sanctioned and in accordance with the terms & conditions laid down by the University Grants Commission.



Signature of Principal
Investigator



Registrar/Principal
Registrar,
Guru Nanak Dev University,
Amritsar,



UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DEHLI-110 002

Annexure-V

STATEMENT OF EXPENDITURE IN RESPECT OF MAJOR/MINOR RESEARCH PROJECT:

1. Name of Principal Investigator **Dr. Anish Dua**
2. Deptt. of University/College **Department of Zoology,
Guru Nanak Dev University, Amritsar**
3. UGC approval No. & Date **F.No.34-472/2008 (SR) dated- 31-12-2008**
4. Title of the research project **" Identification and Conservation of Threatened
Fish Species of River Ravi"**
5. Effective date of starting the project **01-02-2009**
6. (a) Period of Expenditure: **01-02-2009 to 31-01-2012**

b) Details of Expenditure:

S.No	Item	Total Grant Sanctioned	Expenditure Incurred (Rs.)
I	Books & Journals	25,000/-	22,172/-
ii	Equipment	2, 00,000/-	1,99,477/-
iii	Contingency	80,000/-	76,683/-
iv	Field work/ travel (Give details in the proforma at annexure VII	50,000/-	49,472/-
v	Hiring services	50,000/-	49,909/-
vi	Chemicals and glassware	50,000/-	49,928/-
vii	Overhead	46,800/-	1242/-
viii	Any other items		
	TOTAL	7,89,800/-	4,48,883/-

- (c) Staff **Mrs Rupinder Kaur** **Project Fellow**
- Date of appointment **06-10-2009**

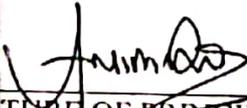
S.No.	Expenditure Incurred	From to	Total Grant Sanctioned	Expenditure (Rs.)
1	Project fellow Consolidated salary @Rs. 8000/- p.m.	06-10-09 to 31-01-2012	2,88,000/-	2,11,631/-
	Grand Total			6,60,514/-

1. It is certified that appointment (s) have been made in accordance with in accordance with the terms and conditions laid down by the commission.

2. If as the results of check or audit objection, some irregularity is noticed, at a later date, action will be taken to refund adjust or regularized the objected amounts.

3. Payment @ revised rates shall be made with arrear on the availability of additional funds.

4. It is certified that out of the grant of Rs.6,79,091/- received from University Grants Commission under the scheme of support of Major Research Project entitled "Identification and Conservation of Threatened Fish Species of River Ravi" vide UGC letter No. F. No. 34-472/2008 (SR) dated 31-12-2008, a sum of Rs.6,79,091/- has been utilized for the purpose for which it was sanctioned and in accordance with the terms and conditions laid down by the UGC.


SIGNATURE OF PRINCIPAL INVESTIGATOR


REGISTRAR/ PRINCIPAL



ज्ञान-विज्ञान विमुक्तये

Annexure-VI

UNIVERSITY GRANTS COMMISSION
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STATEMENT OF EXPENDITURE INCURRED ON FIELD WORK

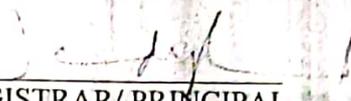
NAME OF PRINCIPLE INVESTIGATOR : Dr Anish Dua

NAME OF PLACE VISITED	DURATION OF VISIT		MODE OF JOURNEY	EXPENDITURE INCURRED (Rs)
	FROM	TO		
AJNALA, GURDASPUR	29-11-09		TAXI	1,065/-
CHAMBA, Dalhousie	13-12-09	15-12-09	TAXI	3,060/-
AJNALA, GAGOMAHAL, KATHLOUR, CHAMBA, BRAHMOUR, HADSAR	19-1-10	23-1-10	TAXI	7,419/-
AJNALA, GAGOMAHAL, KATHLOUR, CHAMBA, BRAHMOUR, HADSAR	5-4-10	12-4-10	TAXI	11,794/-
DELHI	29-10-10		TRAIN	1,680/-
AJNALA, GAGOMAHAL, KATHLOUR, CHAMBA, BRAHMOUR, HADSAR	22-10-10	26-10-10	TAXI	9,974/-
AJNALA, GAGOMAHAL, KATHLOUR, CHAMBA, BRAHMOUR, HADSAR, BUDHIL, HOLI	12-09-22	17-9-11	TAXI	14,480

Certified that the above expenditure is in accordance with the UGC norms for Major Research Projects



SIGNATURE OF PRINCIPAL INVESTIGATOR



REGISTRAR/ PRINCIPAL
Registrar,
Guru Nanak Dev University,
Amritsar.



Annexure – IX

UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI – 110 002.

PROFORMA FOR SUBMISSION OF INFORMATION AT THE TIME OF
SENDING THE FINAL REPORT OF THE WORK DONE ON THE PROJECT

1. Name and Address of Principal Investigator Prof (Dr) Anish Dua
Department of Zoology,
Guru Nanak Dev University, Amritsar
2. Name and Address of the Institution Department of Zoology,
Guru Nanak Dev University, Amritsar
3. UGC Approval No and Date F.No.34-472/2008 (SR) dated- 31-12-2008
4. Date of Implementation 01-02-2009
5. Tenure of the Project
6. Total Grant Allocated 7,89,800/-
7. Total Grant Received 6,79,091/-
8. Final Expenditure 6,79,091/-
9. Title of the Project "Identification and Conservation of
Threatened Fish Species of River Ravi"
10. Objectives of the Project Enclosure (1A)
11. Whether Objectives were Achived (Give Details) Yes
12. Achievements from the Project Enclosure (1A)
13. Summary of the Findings Enclosure (1C)
(IN 500 WORDS)
14. Contribution to the Society
(Give Details)
15. Whether any PH.D enrolled/ Produced out of the Project Yes (Rupinder Kaur)
16. No of Publication out of the Project (Please attach re-prints) Enclosure (1B)


(PRINCIPAL INVESTIGATOR)


Registrar,
Guru Nanak Dev University,
Amritsar
(REGISTRAR/PRINCIPAL)

ENCLOSURE IA

- Providing a consistent frame of reference for communicating stream and river morphology and condition.
- Predicting stream and river behaviour from appearance. Also, to identify physical, biological and chemical structural details of river Ravi and their relationship with fishery parameters.
- Providing a context for evaluating overall aquatic health.
- Providing information regarding the fish fauna of the river Ravi.
- Determining the IUCN status of the fish found.
- To document the fish species abundance, diversity and assemblages of the river Ravi.
- To identify the kinds and magnitude of threats posed to fish fauna of river Ravi.
- Help in the management of a stream & river, and restoration of aquatic habitat and to draft suitable conservation measures for the threatened fish species.

Achievements

- ◆ The river surveys have been carried out where fishing operations were done with the help of various fishing gears.
 - Gill net/drift net- Reservoir
 - Cast net- Streams and shallow waters.
 - Dip net- For collecting small schools of fishes.
 - Angling rods- In fast flowing waters
 - Bifurcated spears- for killing single large fish in shallow waters.
 - Shallow lift net
- ◆ Fish caught was immediately photographed and stored in formalin and fish species identification is carried out by using Morphometric characters and Meristic counts following criteria given by Jayaram (2002), Talwar & Jhingran (1991) and Monograph on the fishes of Re-organised Punjab by Johal & Tandon (1979). We have caught 50 fish species belonging to different families.
- ◆ IUCN status of fishes is checked from Fishbase, IUCN red list.
- ◆ Water quality analysis of the fishing sites has been carried out to determine the Water Quality Index as it is very important for the assessment of level of pollution in a water body.

ENCLOSURE I B

Publications

- **Rupinder kaur** and Anish Dua
Abstract on "Status and Threats of Fisheries of River Ravi in India."
National Seminar on Environmental Analysis & Remediation
organized by Department of Botanical and Environmental Sciences,
GNDU, Amritsar. (21-22 March, 2011).
- **Rupinder kaur** and Anish Dua
Abstract on "Ichthyofaunal Diversity of River Ravi in Indian Region."
15th Punjab Science Congress by Punjab Academy of Sciences,
Patiala organized by, Guru Nanak Dev University, Amritsar. (07-09
February , 2012).

ENCLOSURE IC

SUMMARY

The present study on the ecology of river Ravi was carried out in Punjab and Himachal Pradesh with the view to evaluate its best designated use. Ravi is the smallest of all the five eastern tributaries of the Indus.

Following Rosgen classification, river Ravi and 28 streams making this system were investigated and classified. The altitude ranged between 212-2116 msl. Hill streams falling into Ravi were classified to be of A & B type. The main river Ravi is an F type stream with low gradient, riffle pool morphology. Channel is highly meandering with laterally unstable right bank, silted bottom and vast floodplain area.

Kalsui is classified as Aa+ type stream with highly entrenched channel, steep gradient and is a second order stream with step pools as the dominant features. Panjpula, Chimma, Gehra, Ki, Holi and Ale are A- type, first order headwater streams with no tributaries, turbulent flow, straight channel and steep gradient while Kiyani, Pringala and Patti Khad are classified as B-Type headwater streams.

Naini, Devidera, Chamenu, Garehr, Chirchind, Jura, Noi and Barai are second order; A-type streams with straight channel, small waterfalls, cascades and plunge pools as their dominant features. Kiri and Kuleth are classified as second order B-type streams with riffles, cascades and plunge pools as dominant features.

Chaned, Lil, Kurasi and Gharat are third order streams with high discharge while Manimahesh stream is the fourth order stream and all are classified as A type streams. Sal near Saho is the third order, B-type stream while Budil at high altitudes is the fifth order stream. Kiran nala in Punjab is the second order E-type stream with low gradient, highly sinuous, stable, well vegetated channels and silt-sand as bed features.

River Ravi is an F-type stream with low gradient, riffle pool morphology. It runs with laminar flow and has deep pools at the bends with the depth of 8-12 ft in plains. Channel is highly meandering with laterally unstable right bank, silted bottom and vast flood prone area. In Himachal Pradesh Ravi channel is meandering with low gradient and slightly entrenched channel but the dominant bed features are slit, gravels and cobbles.

Due to impoundment of water for hydroelectric power generation at Ranjit Sagar and Chamera Dams and channelization of water by canals the natural fluvial geomorphology has somewhat been disrupted. Also disposal of sewage and organic waste and toxic chemicals have badly affected Ravi water. Further constructions, removal of boulders has destroyed the habitat of many flora and fauna.

Out of the total twenty eight streams and Ravi main channel, seventeen streams are without any pollution, they are generally situated at a high altitude and nine streams receive sewage and domestic wastes.

Based on the water quality assessment (DO, pH, Acidity, Chlorides, Total hardness, BOD, TDS, TSS) of river Ravi and various streams falling into it at different sites, it was found that the physico-chemical parameters of water quality were within permissible limits of Environmental Protection Agency Criteria for Drinking water and Bureau of Indian Standards for drinking water.

Of the 50 fish species reported from this geographical area many were bearing the brunt of the threats imparted by natural and/or anthropogenic factors. Of these the literature suggests that water extraction, industrial and domestic effluents, the spread of invasive species, altered hydrology, habitat degradation and overharvest of resources are critical. *Schizothorax richardsonii* is assessed as Vulnerable; *Barilius barna* and *Barilius bendelisis* are locally threatened; *Puntius chelynooides* has been assessed to be Vulnerable; *Puntius jerdoni* a bottom feeder is threatened; *Tor putitora* is assessed as endangered species; *Wallago attu* is nearly threatened and *Tor tor* is reported to be near Threatened. The status of fish was determined from IUCN criteria and FishBase.