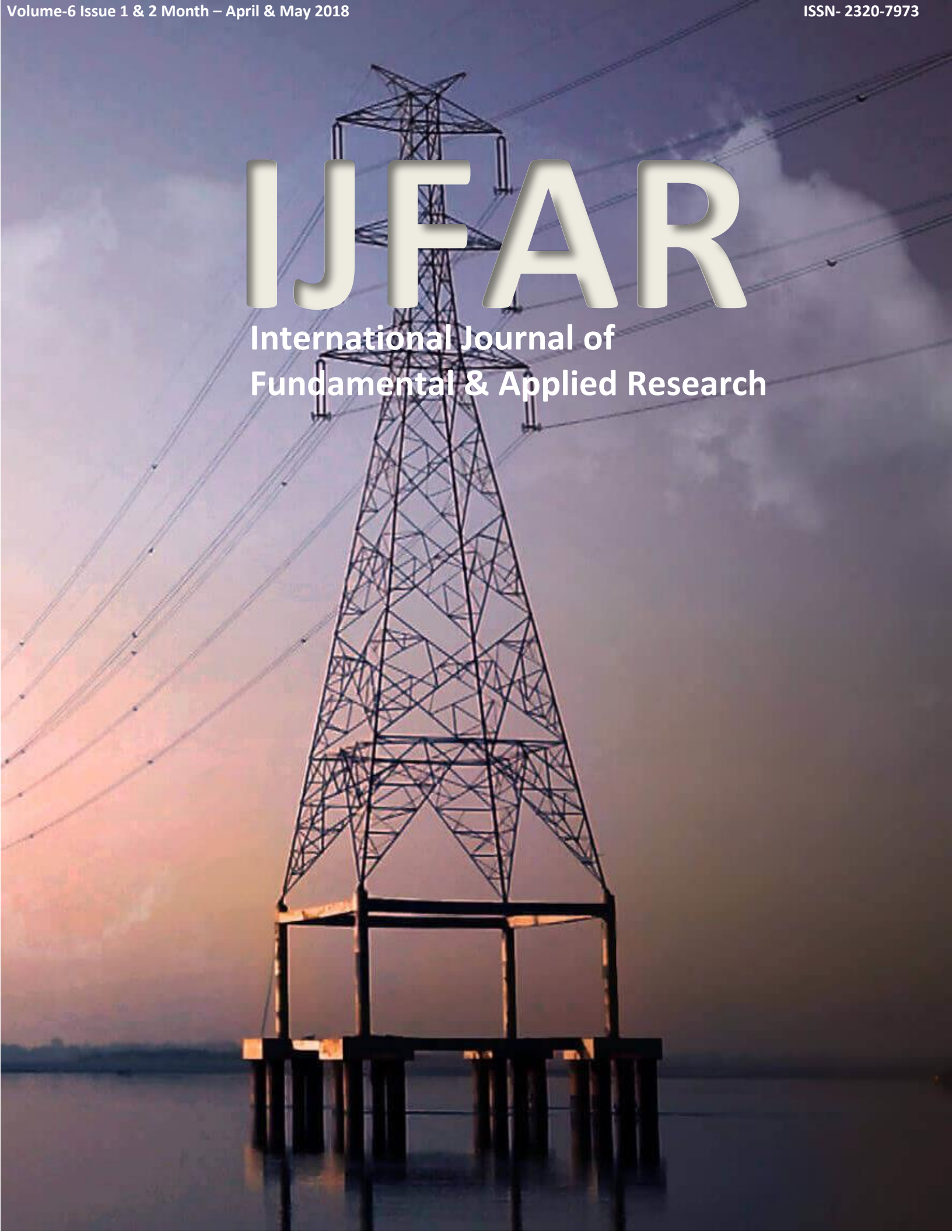


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Status and Distribution of Gharial and Mugger in Son Gharial Sanctuary

R.K. Sharma¹, Dileep Kumar², Udyan Rao Pawar³ & Sanjay Sharma⁴

1: National Chambal Sanctuary, Morena Madhya Pradesh, India

2: Additional Principal Chief Conservator of Forest and Wildlife , Bhopal (M.P.)

3: Pawar Kothi Dusshera Maidan, Near G.R. Medical College, Gwalior (M.P.) 4740 09

4: 23- Vikas Nagar, Gwalior 474 002

ABSTRACT

The Son Gharial Sanctuary has been a safe adobe for Gharial and mugger for past three decades. No extensive study has been done so far to establish proper population density and trends. The present study was carried out to find out the status of Gharial, Mugger. Approximately 122 km. stretch in the Sanctuary was surveyed and data related to population of Gharial and Mugger, in relation to their habitat, profile of river, human interference and threats were collected. A total of 24 Gharial and 19 Mugger were observed. Only two groups of Gharials were located at **Jogdah Ghat** and **Kutlideh Ghat**. Major stretch of the river was found sub-optimal for sustenance of viable population of Gharial since biotic pressure was observed to be too high in terms of sand mining, fishing, grazing, cattle wading, agriculture and other anthropogenic activities. Construction of **Ban Sagar Dam** also reduced the water level making most of the stretch sub-optimal for Gharial and Mugger. Thus these animals were found confined in deep pools at scattered places. Recommendations suggested on the basis of the observations during the present survey includes need of extensive survey of the entire river stretch for habitat management, reduction in human interference and flow management.

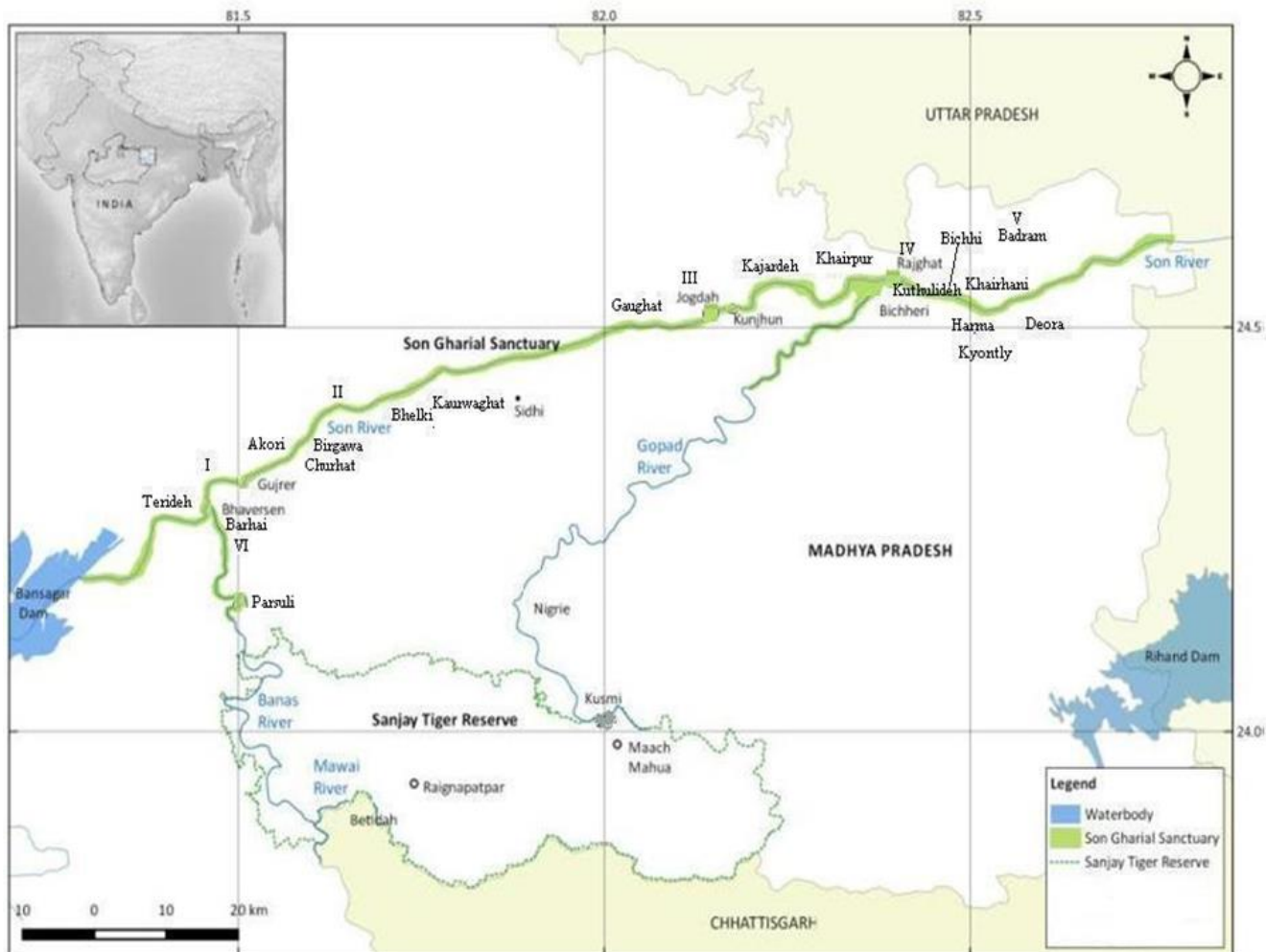
INTRODUCTION

The **River Son** is a major tributary of **River Ganga**. It originates from **Shosa Kund** in Amarkantak Bilaspur District of Chhattisgarh. The river flows through Madhya Pradesh, Uttar Pradesh and meets Ganga in Bihar. The **Son Gharial Sanctuary** was notified as Sanctuary by Madhya Pradesh Forest Department in 1981 (*vide Gazette No. 14-47-80-10(2)Bhopal. dated 23-09-1981*) and includes the 161 km stretch of the Son River from the **Ban Sagar Dam** to **Deora** up to U.P. Border. The Sanctuary falls within longitude 81°20' and 82°50' E and latitude 24.15' and 25°40' N. This stretch of the river Son flows initially along the border between Shadol/Satna and then Shadol/Sidhi Districts and finally in the Sidhi District of Madhya Pradesh. The Sanctuary also includes **Gopad** and **Basnas River** totaling an additional 48 km. Near the

Ban Sagar Dam site, the Son passes through a narrow gorge beyond which the River widens to a span of one km. At certain points, the river varies widely in depth from 1 feet to 40 ft. **The Sanctuary was a safe adobe for Gharial, mugger, turtles and birds for past decades. It was also declared as breeding ground for Indian Skimmer and Chitra indica in recent years.**

As per the initial surveys done on the Son river [Sharma *et al* (1994), IUCN (2000), Sharma *et al* (1999)], a total of 13 Gharials were sighted in the Son Gharial Sanctuary. Sharma *et al* (2011) conducted a survey in 2010 and observed 14 Gharial in Son Gharial Sanctuary. Sharma & Sharma (1997) observed 35 Gharials in the Son Gharial Sanctuary in 1996. Nair and Katdare (2013) survey in 2013 on river Son reported 20 Gharials. Sharma & Singh (2015) reported

presence of Muggers in the river Chambal falling in National Chambal Sanctuary.



METHODOLOGY

The survey was conducted during **5th to 10th December, 2017**, covering a total stretch of approximately **122 kms. in Son Gharial Sanctuary**, comprising of **101 km. of son river** between **Terideh to Deora**, and **21 kms. of Banas river** (a tributary of son river) between **Parsuli to Barhai**. A comprehensive study was carried out for identification of Gharial and Mugger habitats. The Investigation team along with supporting staff moved by row boat and vehicle as a group

between 10:00 hr and 17:00 hr. Team members used 10×50 Binoculars to spot Gharial and Muggers, mostly as they basked on land or were swimming or on their appearance on surface for breathing. Animals seen, were recorded along with sighting time, GPS locations and nearest village name on data-sheets. Photographic records were made by 10× Optical 100 M Sony Camera. The spatial-temporal distribution of Gharial and Mugger were recorded at geographical co-ordinates. The population of

Gharial and Mugger was estimated by direct sighting method for different age groups according to Size class criteria given in Table 1. The study area in the Sanctuary has been divided into smaller zones as shown date wise in table -1. The month of December was found to be more suitable for Gharial and Mugger survey because the animal can easily be located when they come out for basking, since the water temperature is low. Therefore, this period, has been selected for Survey as most of the animals can be counted in single operation.

RESULTS AND DISCUSSION

During the present survey, a total of 24 Gharials comprising 08 adult females, 07 sub-adult, 09 juveniles were recorded. (Table-1). The maximum numbers of Gharials (22) were sighted at *Jogdah ghat* (Survey zone III) and the minimum numbers (2) were sighted at *Kuthulideh* (Survey Zone IV) The Zone wise details of Gharial enumerated are given in Table-1.

Table-1, Number of Gharials and Mugger Sighted in Son Gharial Sanctuary

Survey Zone	Area Covered (Date)	Distance	Water Depth (in Feet)	Gharial			Mugger			
				A	SA	J	A	SA	J	Y
I	Terideh, Bhavarsen Gujrer (05.12.2017)	9.8	15-25	0	0	0	1	1	0	0
II	Akori, Churhat Bridge, Birgawa, Bhelki, Kaurwaghat (06.12.2017)	16.47	10-15.	0	0	0	0	0	0	0
III	Gaughat, Jogdah, Kukrwa (07.12.2017)	28.3	35-40	7	6	9	5	4	2	1
IV	Lahurghat, Jhariaghat, Baghar, Kajardeh, Kherpur, Rajghat, Kuthulideh, Bichhi (08.12.2017)	18.25	12-18.	1	1	0	2	2	1	0
V	Khairhani, Harma, Kyontaly, Badram (Deora) (09.12.2017)	28.10	5-8.	0	0	0	0	0	0	0
VI	Parsuli, Kathbauglow, Naudhiya, Barhai (10.12.2017)	20.7	1-5.	0	0	0	0	0	0	0
	Total	121.62		8	7	9	8	7	3	1

A = Adults ; SA = Sub Adult ; J = Juvenile ; Y = Yearling

The total no of 19 muggers of various size groups. There are 08 adults , 7 sub adults, 3 juveniles, and 1 yearling which were recorded in the sanctuary.

The Son Gharial Sanctuary has continued to be a safe place for Gharial and Mugger ever since the populations were discovered in 1980s. The son river in its natural form supported a substantial number of those elegant animals. Biotic pressure started rising as human habitation started encroaching the river banks. Increase in agriculture and livestock grazing, construction of Ban Sagar Dam resulted in water extraction from the river. This lowered the water level and resulted in low flow condition in the river. Lowering of flow also enhanced siltation and further lowered the depth. All of these phenomena synergistically affected the Gharial and mugger, as these large aquatic animals need specific depth and flow of water. Grazing, agriculture and other human activities degraded the nesting and basking sandy beaches along the river bank. The local community is dependent for food upon the fishes in the river and also practices unsustainable methods of fishing with explosives and netting. It has done havoc on the fish and turtle population and endangered Gharial and Mugger populations.

RECOMMENDATIONS

Some important aspects proposed for holistic management of the sanctuary and population of Gharial and Mugger are as under:

1. In the Son Gharial Sanctuary, with all its male Gharials wiped out has resulted in a stoppage of their breeding. There is an urgent need of reintroducing male Gharials from other habitats for ensuring the breeding and propagation of the species, otherwise it will result in their extinction in the sanctuary. During the

survey, the team found suitable Gharial release site, which is **Jogdah**.

2. To give a boost to the existing population of Gharials, release of juvenile Gharials should also be made. The juveniles must be taken to the artificial enclosure made in **Jogdah** and then be released to multiple sites from there. The suitable sites for gharial release are - **Terideh, Bhelki, Jogdah, Kajardeh and Kuthulideh**.
3. The Forest Staffs in the field should be given technical training in terms of handling of Gharial eggs, artificial nest construction and caring during hatching of the eggs.
4. As Indian Skimmer was observed in this Sanctuary at **Bichhi Ghat** on the sand bank, it should be protected by barring human interference from the island. These birds should be monitored regularly and proper care should be taken as they may nest in this region till breeding (May-June).
5. A complete vigilance against illegal sand mining fishing, agriculture and grazing activities in the Sanctuary should be maintained.
6. The local community who are dependent upon fishes for food should be made aware of conservation values of endangered species.
7. To maintain a near natural flow regime in the dry months, timely water release from the Dam may be provided to optimize the depth and flow requirement of Gharial and Mugger.
8. The water quality of the River may also be analyzed on a regular basis to find out pollution status of the river water.
9. Field staffs should be provided with proper equipment and knowledge to

keep scientific record of the population trends in Gharial and Mugger.

10. Annual census of key aquatic fauna and major aquatic birds should be done throughout the Sanctuary.

ACKNOWLEDGEMENTS

We are indebted to Shri Jitendra Kumar Agrawal, Principal Chief Conservator of Forest (Wildlife) Bhopal, for his keen interest and valuable suggestions. Without his support this survey could not have been completed. We appreciate Shri M. Kalidurai, CCF Rewa for his support and encouragement. Thanks are also to Shri R.N. Choudhari, Incharge, Joint Director, Sanjay Tiger Reserve Sidhi for his sustained interest and extending cooperation in various ways during the survey. We are also very thankful to Game Range Officer, Deputy Ranger and field staff of Son Gharial Sanctuary, Sidhi for their active co-operation during field work.

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Physico-chemical analysis of Laboratory waste effluents at the Outlet of Govt. Sarojani Naidu Girls P.G. College, Bhopal

Pallavi Gupta
MANIT, Bhopal

ABSTRACT

When laboratory waste effluents are discharged directly into water resources it badly affect the environment. Various type of pollution take place as water , air and soil pollution which makes these chemicals enter the water cycle, food chain , bio accumulate in humans and other living organisms especially those consumed eventually by man , making it possible to cause cancer and many other life reducing diseases .It also pollutes the environment leading to erratic weather conditions , heat waves , ozone layer depletion , melting of ice, bringing about imbalance in the various ecosystem .All these make it important for legislative regulations to be formulated for environmental management by all stakeholders.

INTRODUCTION

Laboratory waste are also responsible for producing diseases and due to dumping in a water body can also contaminate the water and the accumulation toxic substances in the food chain through the plant and animals that feed it. The laboratories waste broken glass, syringes benefits, thermometer can be collected in perches registrant containers. Students who work in chemical laboratories are exposed to many kinds of hazards. Although many kinds of workplaces, laboratories have a variety of hazards as chemicals in which some hazards are seldom encountered elsewhere. The laboratories in which chemicals are used must be prepared to deal with hazardous substances.

Methodology : The samples of laboratory, chemical waste and there waste now from towards water reservoirs were collected and preserved as per

prescribed procedure of APHA, and BIS
Prior to this a general survey was conducted to know about other outlets and minor streams leading to probable pollution sources. Preservation of sample and pre-treatment methods were apphed was analysis recommended by APHA and BIS. Sample will be kept for long duration may suffer change in composition because of various interactions. The optimum sample aging time range from immediate for analysis pH and temperature and DO 7 days for metals, it is therefore must be compulsory to preservation techniques for the sample, because these are essential for retarding the biological action hydrolysis and precipitation of chemical compounds and complex, and reduction of volatility of constituents available in the sample. In order to get approtoxiate results the DO was analyzed at the time of sample collection. With in 4 hours and 24 hours for others, from the time of collection.

PRESERVATION

Preservative Technique used	Effect on Sample	Type of samples for which the method is employed
Nitric acid	Keep metals in solution	Metal Containing samples.
Sulphuric acid	Bactericide	Biodegradable samples Including organic carbon, COD oil and grease
Sodium hydroxide	Formation of sodium salts with volatile acids.	Volatile organic acids, cyanides.
Mercuric chloride	Bactericide	Samples containing various forms of nitrogen or phosphorous, some biodegradable organics
Cooling (4°C)	Inhibition of bacteria, retention of volatile material	Micro organisms, acidity, alkalinity, BOD, Organic C, P, and N, Colour, odour.
Chemical reaction	Fix a Particular constituent	Dissolved oxygen determined by the winkler method.

Handling of Samples:-

Parameter	Size of the sample (ml)	Sample container used	Preservation Technique
pH	100	Plastic	Measure within 0-4 hours
COD	500	Plastic	Keep the sample in a refrigerator add conc H ₂ SO ₄ to pH 2-2.5
NH ₃	500	Plastic	Quickly analyze the sample, add 0.8 ml of conc H ₂ SO ₄ .
NO ₃	500	Plastic	Add 40 mg HgCl ₂ /litre and place the sample in refrigerator
Sulphate	500	Plastic	Add 1 ml of zinc acetate (2N) and 2 ml of NaOH (1M) shake and keep the sample in refrigerator.
Phosphate	500	Plastic	Same as in case of NO ₃ + NO ₂
Heavy metals	500	Plastic	Add 5 ml of conc HNO ₃ per litre and place in the refrigerator.

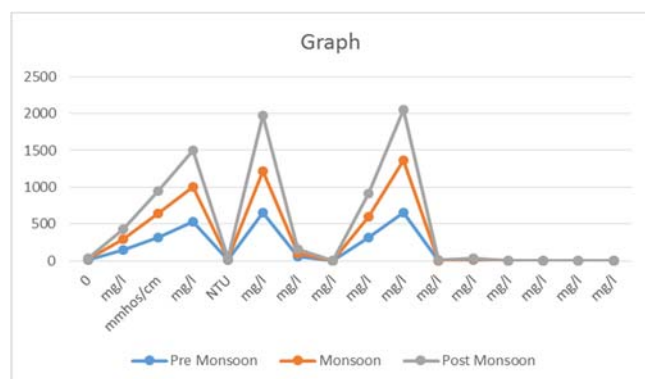
Result and discussion: During the tenure of the study at Govt. sarojani Naidu Girls P.G. college Bhopal. pH maximum at pre monsoon and minimum at monsoon. Total Hardness maximum at monsoon and minimum at post monsoon. Elec. Conductivity same at pre monsoon and monsoon while minimum at post monsoon. Total solid maximum at pre monsoon and minimum at monsoon. Turbidity maximum at post monsoon and minimum at monsoon. Ammonical nitrogen maximum at post monsoon minimum at monsoon. Nitrate maximum at post monsoon and minimum at monsoon. Phosphate

maximum same at pre monsoon and monsoon while minimum at post monsoon. Chloride same at pre monsoon and post monsoon while minimum at monsoon. BOD maximum at monsoon and minimum at post monsoon. COD maximum at monsoon and minimum at post monsoon. Amount of Cu maximum at post monsoon while same at pre monsoon and monsoon. Amount of Pb maximum at pre monsoon while same at monsoon and post monsoon. Amount of Fe same at pre monsoon, monsoon and post monsoon. Amount of Cr maximum at monsoon and same at pre monsoon and post monsoon.

TABLE NO. – 1 : Chemicopotential study of Laboratory Liquid Waste at the Outlet of Govt. Sarojani Naidu Girls P.G. College Laboratory, Bhopal

S.No.	Parameter	Unit	Pre Monsoon	Monsoon	Post Monsoon
1	Ph	0	11.1	10.8	10.9
2	Total hardness	mg/l	143	148	141
3	Ele. Conductivity	µmhos/cm	320	320	310
4	Total Solid	mg/l	532	467	498
5	Turbidity	NTU	13.6	10.0	14.2
6	Ammonical Nitrogen	mg/l	653	569	750
7	Nitrate	mg/l	52	45	65
8	Phosphate	mg/l	0.2	0.2	0.3
9	Chloride	mg/l	311	287	311
10	Sulphate	mg/l	653	711	693
11	BOD	mg/l	2.6	3.0	2.5
12	COD	mg/l	13.1	13.7	11.4
13	Copper	mg/l	0.03	0.03	0.04
14	Lead	mg/l	0.08	0.02	0.02
15	Iron	mg/l	0.6	0.6	0.6
16	Chromium	mg/l	0.17	0.18	0.17

Graph:



Conclusion : Limits of BIS and APHA Rules . So it is Clear that water quality is not suitable for various proposes in the environment. Studies carried out in present investigation revealed that one of the most important causes of water pollution is disposal of untreated chemical effluents without adequate attention to suitable management of toxicants Hence it is

concluded that maximum parameter are found in excess than permissible .

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मन्नू भण्डारी की कहानियाँ—हिन्दी कहानी को योगदान

चंदा मोदी,

सहायक प्राध्यापक,

आनंद विहार कॉलेज भोपाल

सार संक्षेप

स्वातंत्र्योत्तर हिन्दी कहानी में आधुनिकता की चुनौतियों को कई रूपों में स्वीकार किया गया है। विभिन्न रूपों का मार्मिक चित्रण करने में महिला कथाकारों में मन्नू भण्डारी एक सफल लेखिका हैं और यही वजह है कि महिला कहानीकारों में सबसे बड़ा साहित्यिक योगदान इनका है। उनको कहानी लेखिका के रूप में ही सर्वाधिक ख्याति प्राप्त हुई है, उन्होंने समकालीन कहानीकारों में विशिष्ट स्थान बनाया है। साहित्य जगत में उनका आगमन कहानी पत्रिका में प्रकाशित **“मैं हार गईं”** कहानी से हुआ, इसके बाद उन्होंने कभी पीछे मुड़कर नहीं देखा। मन्नूजी पारिवारिक और सामाजिक परिवेश में नारी मन की टूटन एवं घुटन, पुरुष के मन में उठने वाले संदेह एवं ईर्ष्या भावना आदि को अपनी कहानियों में अभिव्यक्ति प्रदान की है, वहीं दूसरी ओर कहानियों में आधुनिकता की चुनौतियों, कुंठा, संत्रास, यौन चित्रण, अजनबीपन, अंतर्द्वन्द्वता, पश्चिमीकरण, राजनीतिक फूहड़ता तथा आधुनिकता से उत्पन्न नई नैतिकता की धारणा का चित्रण अपनी कहानियों में किया है और यही वजह है कि उनकी कहानियों में जीवन स्थितियों का जीवंत चित्र उपस्थित होता है। उनकी कहानियाँ मध्यमवर्गीय विवशताओं की कहानियाँ हैं जिनमें पात्र कुछ न कर पाने की स्थिति में रहते हैं, उनमें एक प्रकार की निरीहता और विसंगतियों के साथ समझौता करने का भाव स्पष्ट दिखाई देता है। अतः इस प्रकार मन्नू भण्डारी की कहानियों ने हिन्दी कहानी को महत्वपूर्ण योगदान दिया है।

कथावस्तु

मन्नूजी सही अर्थों में आधुनिकता के महानगरीय परिवेश की कहानी लेखिका हैं। इसलिए महानगरीय जीवन से संबद्ध सामाजिक, पारिवारिक और मध्यमवर्गीय जीवन की विडंबनाएँ ही उनके कहानी साहित्य की वस्तु हैं। फलतः जीवन की विसंगतियों, परंपरागत संबंधों की टूटन, सुख की तलाश में भटकते स्त्री-पुरुषों के त्रासद और दमघोंटू स्थितियों, सेक्स स्वेच्छाचार की बढ़ती प्रवृत्ति, दाम्पत्य संबंधों तनाव, संदेह, ईर्ष्या, घुटन और टूटन आदि स्थितियों का अंकन इन्होंने अपनी कहानियों में उभारा है। इसके अलावा ग्रामीण और राजनैतिक परिवेश को छूने के साथ ही नारी स्वतंत्रता के लिए जहां पहली आवश्यकता आर्थिक स्वतंत्रता को माना है तो वहीं दूसरी ओर इन्होंने विवाह को परिवार की रीढ़ निरूपित किया है।

वे आधुनिक चेतना की समर्थ कथाकार हैं। इन्होंने अपने समग्र साहित्य में नारी अस्तित्व और उसकी अस्मिता की खोज की है। जीवन यात्रा में निकले हुए और इस यात्रा पर हर प्रकार की विडंबनाओं से गुजर रहे आज के मानव की पीड़ा को मार्मिक और अनुभूतिपूर्ण अभिव्यक्ति प्रदान की है। आज के समूचे मध्यमवर्गीय समाज की विभीषिका, टूटन, बनते-बिगड़ते जीवन की टकराहट से उत्पन्न विडंबनाओं को साफ-साफ उभारने में सफल हुई हैं। वे कथानक का संयोजन कुछ इस प्रकार करती है। कि सादगी लुभाती है और पाठक पर सीधा प्रभाव छोड़ती है। यही कारण है कि उन्हें जिस तेजी के साथ साहित्य की दुनिया में प्रतिष्ठा प्राप्त हुई वह प्रायः कम लोगों को ही मिल पाती है।

कहानी में पात्रों का बहुत महत्व होता है क्योंकि वे कहानी के एक छोटे से प्लॉट को विस्तार देने और उद्देश्य तक पहुंचाने में अनिवार्य भूमिका निभाते हैं। चूंकि मन्नू भण्डारी

परिवार, समाज विशेषकर महानगरीय जीवन की लेखिका हैं इसलिए उनके पात्र अपने आसपास के होते हैं। स्त्री पात्रों के साथ-साथ अन्य पात्र इनकी कहानियों में स्वाभाविक रूप से आए हैं। कहानियाँ पढ़ते हुए कहीं यह अनुभव नहीं होता है कि पात्रों का भराव किया गया है।

कहानी की रचना में यद्यपि संवाद या कथोपकथन की नितांत आवश्यकता नहीं होती है फिर भी चुटीले संवाद कहानी में प्रभाव उत्पन्न करने के साथ पाठक की जिज्ञासा बढ़ाते हैं। मन्नू भण्डारी भी इनसे अछूती नहीं है। इनकी कहानियाँ ऐसे चुटीले संवादों से भरी-पूरी हैं। कहानी में जहाँ छोटे-छोटे संवाद चरित्र को उजागर करते हैं वहीं गंभीर विचार के परिचायक भी होते हैं। मनःस्थितियों का चित्रण भी संवाद के माध्यम किया है।

भाषा रोजमर्रा की और जनजीवन से जुड़ी हुई है, लेकिन इन्होंने संवादों में उसका इतना सरलीकरण भी नहीं किया है कि वे किसी तरह से कहानी के सौंदर्य और मूल उद्देश्य को क्षतिग्रस्त करें। ऐसी भाषा पर अधिकार जिन कथाकारों जिन कथाकारों के पास होता है वे पाठक के मन में सरलता से अपनी जगह बना लेते हैं ऐसा कहानियों की सादगीपूर्ण भाषा शैली के कारण ही है। आम मुहावरे और विचारात्मक सूत्र, टिप्पणियाँ इत्यादि भी इनकी कहानियों में मिलती हैं। संवादों में कहीं बनावटीपन या पात्रों पर थोपे जाने का अहसास पाठक को नहीं होता है। इस अर्थ में मन्नूजी के पास जो भाषा शिल्प है वह उन्हें अन्य कथाकारों से अलग करता है।

कहानी रचना में देश-काल, वातावरण का बहुत महत्व होता है। यदि कोई लेखक इसका निर्वाह नहीं कर पाता है तो उसकी कहानियाँ यथार्थ से परे अनुभव होती हैं। इनकी

कहानियों में देशकाल और वातावरण के अनुसार परिस्थितिवश भाषा की प्रधानता मिलती है। देशकाल एवं परिस्थितियों के अनुसार इनका भाषिक अंदाज भी बदला हुआ है जिससे कहानी के कथ्य सम्प्रेषण में बड़ी सहायता मिलती है। इनमें गत्यात्मक बिम्बों, प्रतीकों तथा संकेतों की आयोजना हुई है। संरचना की दृष्टि से इनकी कुछ कहानियाँ मानसिक जगत पर उहापोह की पुनरावृत्ति करती है। यह पुनरावृत्ति अनेक स्थलों पर रचना को कमजोर करती है फिर भी यह कहा जा सकता है कि “यही सच है”, “बंद दरवाजों के साथ” और “ऊँचाई” कहानी को छोड़कर विस्तार के पक्ष में अधिक दृढ़ता से नहीं कहा जा सकता है। मन्नूजी के कथा विस्तार और घटनाक्रम से यह आभास सहज ही हो जाता है कि अंत क्या होगा। इस दृष्टि से “यही सच है”, “छत बनाने वाले”, “ऊँचाई”, “क्षय” आदि कहानियाँ उल्लेखनीय हैं।

कहानी में उद्देश्य प्रमुख होता है चाहे कहानी छोटी हो या बड़ी। कहानीकार घटनाक्रम को विस्तार देते हुए पात्रों के माध्यम से अंत में अपना उद्देश्य या प्रमुख विचार स्पष्ट करता है। मन्नूजी की कहानियाँ वैचारिक उद्देश्य को लिए हुए हैं। इसका तात्पर्य यह नहीं कि वे किसी राजनैतिक विचारधारा से प्रतिबद्ध लेखिका है। एक तटस्थ लेखिका के रूप में वे अपनी सामाजिक भूमिका अदा करती हैं। वे नई कहानी आंदोलन के सूत्रधारों में से हैं। उनकी कहानियाँ अनुभूति की प्रामाणिकता एवं रचनात्मक स्तर की विविधता लिए हुए होने के कारण एक अलग ही पहचान लिए हुए हैं। उनकी गहरी संवेदनशीलता, अनुभव की सच्चाई, प्रस्तुति कौशल आदि ने उन्हें सहज की लोकप्रिय बनाया है। यद्यपि आरंभ में वे स्त्री-पुरुष संबंधों के सीमित दायरों में बधी रही पर आगे चलकर सामाजिक आयामों से भी जुड़ गईं। उनकी कहानियों के इस निरंतर विकासत्मक दृष्टि ने जहाँ उन्हें समकालीन अन्य कथा लेखिकाओं से आगे निकाला है वहीं उनके कहानीकार को दुहराव से बचाया है। आज जब आलोचक हिंदी कथा लेखिकाओं से यह शिकायत करता है कि वे नारी पुरुष के संबंधों तक सीमित रहकर अनुभव के सीमित दायरे में केंद्रित हो गई है तो उन्हें मन्नू को इनसे अलग रखना पड़ता है। “यही सच है” और “त्रिशंकू” कहानी संग्रह की तमाम कहानियाँ संबंधों के विघटन की साक्षी हैं। वे गहरे सामाजिक संदर्भों की पहचान कराती हैं। “रानी मां का चबूतरा” कहानी रूढ़ियों को व्यक्त करती है। “अकेली” व्यक्ति के अकेलेपन को भुलाने के लिए गए प्रयासों से जुड़ी संपूर्ण सामाजिक संदर्भों की कहानी है। “क्षय” आत्मसम्मान और अभिजात्य वर्ग के बीच चलने वाले संघर्ष की अत्यंत ही एक करुणामयी परिणति है। “एखाने आकाश नाई” में गांव और शहर के मध्यमवर्गीय परिवारों की मानसिक टूटन का आंकलन है। “सजा” में आधुनिक न्याय पद्धति की विसंगतियों पर करारा व्यंग्य है। “मजबूरी” कहानी में पीढ़ियों में अंतर और “यही सच है” में दो प्रेमियों को लेकर मन में उपजे द्वन्द्व का चित्रण है। “शायद” कहानी में दो यांत्रिक परिवेशों के बीच फंसे और अस्तित्वहीन एक व्यक्ति की कहानी है। “खोटे सिक्के”, “तीसरा हिस्सा” और “अलगाव” नामक कहानियों में सामाजिक व्यंग्य उभरकर आए हैं।

इस तरह मन्नूजी के कथा साहित्य का केंद्र समाज और व्यक्ति है। वे प्रत्यक्ष या अप्रत्यक्ष रूप से वास्तविक धरातल से जुड़ी हुई हैं। इसलिए इनकी रचनाओं में वास्तविकता विद्यमान है। और यही वजह है कि कहानी को नई दिशा देने वाले कथाकारों में मन्नू भण्डारी पंक्ति के रचनाकार के रूप में प्रतिष्ठित हैं। इन्होंने सरस्ती एवं भावुकतापूर्ण नारी जीवन की कहानियाँ नहीं लिखी हैं। वरन् जिंदगी के सीधे और सहज ढंग से आंकने वाली कहानियाँ लिखी हैं— रोचक और पठनीय भी। आधुनिकता को पेंशन के रूप में नहीं, हमारी बदलती परिस्थितियों के संदर्भ में उन्होंने ग्रहण किया है।

सहज और बेबाक बयानी ने मन्नूजी को साहित्य जगत में एक विशिष्ट स्थान दिया है। उनके रचना संसार में बनावट और बुनावट के स्थान पर सहज गति है उनकी रचनाओं में जटिल और भयावह वातावरण बना देने वाला भाषातंत्र न होकर अनुभूति को उसी खण्ड में व्यक्त करने वाला है। इनका पात्र या तो रोटी की जुगाड़ में व्यस्त है या संघर्ष कर रहा है। पाठक की अपेक्षा में जीवन का जो चित्र बनता है वह स्वाभाविक होता है इसलिए पाठक एक बार कहानी पढ़ना शुरू करता है तो अंत तक बंधा रहता है।

बौद्धिक आडंबर और चुटीले नारों से हिंदी कहानी को मुक्त कराने में वे प्रथम पंक्ति की लेखिका हैं। तेजस्वी विचार, रूढ़िमुक्त साहस और घरेलू आत्मीयता की सहजता इनकी सबसे बड़ी शक्ति है और इसीलिए वे सरस्ती, घटिया और घिसी-पिटी हुए बिना आज भी खूब पढ़ी जाने वाली बहुचर्चित कहानी लेखिका है। बेहद सहज और सीधे पाठकों तक पहुचने वाली इनकी कहानियाँ अपने नए कोणों, बेबाक चित्रण और निभ्रान्त निगाह के कारण बार-बार, हर स्तर और हर क्षेत्र में चर्चित हुई हैं। एक वाक्य में यदि कहना हो तो कह सकते हैं कि— **मन्नूजी परिवार और परिवार के आंतरिक, आत्मीय संबंधों की सूक्ष्म किंतु गंभीर श्रेष्ठ लेखिका हैं, जो कहानी लिखती नहीं, पाठक को घनिष्ठता में लेकर उनकी कहानी लिखती है।**

संदर्भ ग्रन्थ सूची :-

1. मन्नू भण्डारी की कहानियों के प्रमुख पात्र —प्रदीप सी लाड़ पृष्ठ क्र०-60
2. मन्नू भण्डारी की कहानियों के प्रमुख पात्र —प्रदीप सी लाड़ पृष्ठ क्र०-61
3. वर्तमान साहित्य, कहानी महाविशेषांक पृष्ठ क्र०-248,249
4. साक्षात्कार, अंक 154/अक्टूबर, 1992 पृष्ठ क्रमांक-17
5. साक्षात्कार, अंक 154/अक्टूबर, 1992 पृष्ठ क्रमांक-10
6. देशबंधु, दैनिक पत्रिका 2 जून, 1977
7. कथाकार मन्नू भण्डारी—अनीता राजूरकर पृष्ठ क्रमांक-13
8. औरों के बहाने—राजेन्द्र यादव पृष्ठ क्रमांक-64

Series compensation in 400 KV transmission systems with performance comparison with Thyristor Controlled Series Capacitor

Kirti Singh¹ and Amit Gupta²

1: Research Scholar, Gyan Ganga College of Technology, Jabalpur

2: Assistant Professor, Gyan Ganga College of Technology, Jabalpur

ABSTRACT

This paper series compensation in 400KV transmission systems with performance comparison with TCSC investigates the effect of series compensation on transmission voltages under different fault conditions. Insertion of series capacitor in transmission line reduces net line reactance and hence improves the power transfer capability of line. This paper also provides recommendations for the operation of series capacitor. The paper also shows comparison with TCSC. A thyristor- controlled series compensator is composed of a series capacitance which has a parallel branch including a thyristor- controlled reactor. It is used in power systems to dynamically control the reactance of line. A 400kV transmission line from Khandwa to Seoni is taken as an example and monitored in this study. The system is simulated in MATLAB software and simulation results are discussed. The information given here would be valuable for grid operators that deal with compensated lines and switch in and out series capacitors.

INTRODUCTION

The increasing use of non- linear loads in the industries based on the power electronic elements introduced serious perturbation problems in the electric power system. In recent years, the highly increasing cost of building new transmission corridors, has led to a search for increasing the transmission line capacity of existing lines. With series compensation, the viable distances of AC power transmission become sufficiently large to eliminate altogether the issue of distance as a limiting factor for AC transmission in most cases. Thus, series compensation is an efficient way to overcome these issues. It should be inserted in series with transmission line.

Series compensation is the method of improving the system voltage by connecting a capacitor in series with the transmission line. In other words, in series compensation, reactive power is inserted in series with the transmission line for improving the impedance of the system. It improves the power transfer capability of the line. It is mostly used in extra and ultra high voltage line.

The advantages of series compensation are-

- Improvement in System Stability
- Increase in power transfer capability

The power transfer (P_1) over a uncompensated line is given by ;

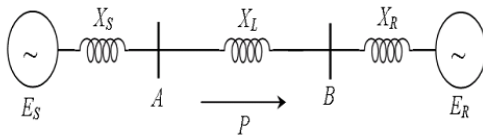


Fig-1 Transmission line without series compensation

$$P_1 = \frac{V_s V_R}{X_L} \sin \delta$$

The power (P_2) transmitted through series compensated transmission line is given by;

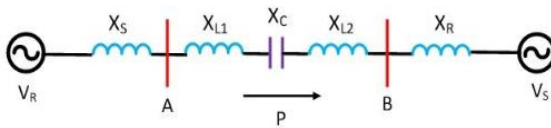


Fig-2- Transmission line with series compensation

$$P_2 = \frac{V_s V_R}{X_L - X_C} \sin \delta$$

$$\frac{P_1}{P_2} = \frac{X_L}{X_L - X_C} = \frac{1}{1 - \frac{X_C}{X_L}} = \frac{1}{1 - k}$$

K is degree of compensation which may lie between 0.4 to 0.8. The amount of transmitted power is increased with series compensation.

- Load Division among Parallel Line
- Control of Voltage

The series capacitor may be located at the sending end, receiving end, or at the center of the line. Sometimes they are located at two or more points along the line.

2. Thyristor Controlled Series Capacitor:-

TCSC is a FACT controller. The use of thyristor control to provide variable series compensation makes it attractive to employ series capacitor in long lines. A thyristor controlled series capacitor comprises of a series capacitor bank shunted by thyristor controlled reactor. Fig. 2 shows a linear reactor 'L' connected to AC source through two thyristors connected in anti parallel. Parallel combination of switched capacitors and controlled reactors provides a smooth current control rang from capacitive to inductive values by switching the capacitor and controlling the current in the reactor.

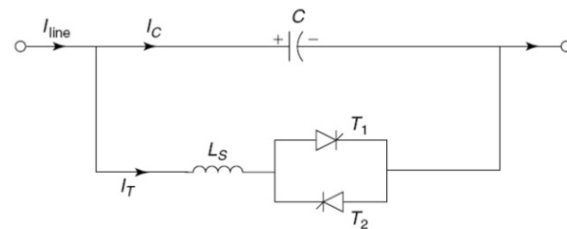


Fig-3- Thyristor Controlled Series Capacitor

Thyristor controlled series capacitor may be used for current control, stability improvement, damping oscillations, and for limiting fault current.

Advantages of FACTS ;

- It increases the loading capability of the lines to their thermal capability.
- Overcoming their limitations and sharing of power among lines can accomplish this.
- Provides greater flexibility in sitting new generation.
- FACTS devices improve the speed of operation of the overall system.
- It improves the stability of the system and thus makes the system secure.

3. MATLAB Simulation and Results :-

The 400 KV three phase transmission systems is simulated in MATLAB using Simulink. The model consist of 400 KV generation system, Step-Up Transformer, Transmission line pi- section of 300 km length, Series capacitors or TCSC. The transmission systems employs three phase R-L Load and connected through circuit breaker. On load side a three phase fault is simulated. Supply system voltage, current is measured. Practical PGCIL Data has been used to obtain simulation results.

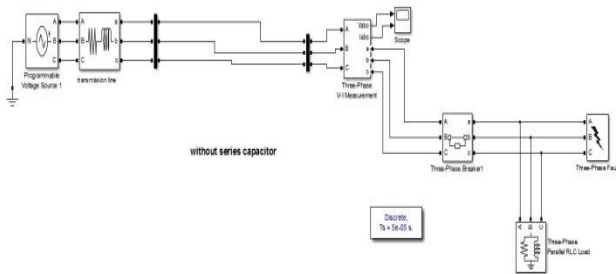


Fig. 4- simulink model of system without series capacitor

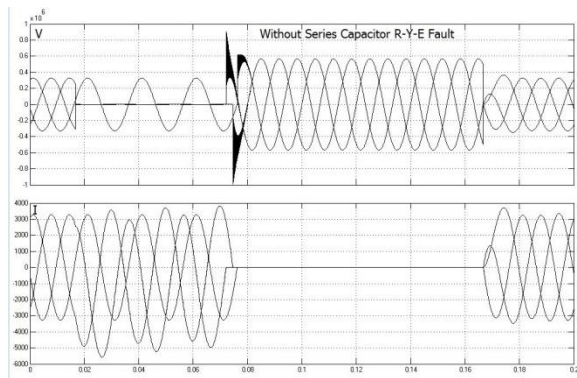


Fig.7-Waveform of V & I without series capacitor

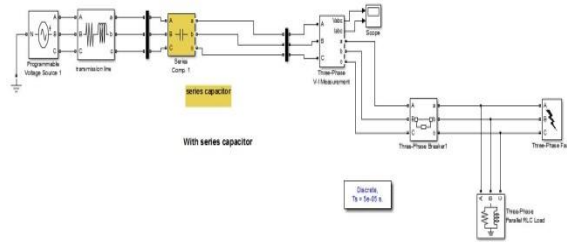


Fig. 5- Simulink model of system with series capacitor

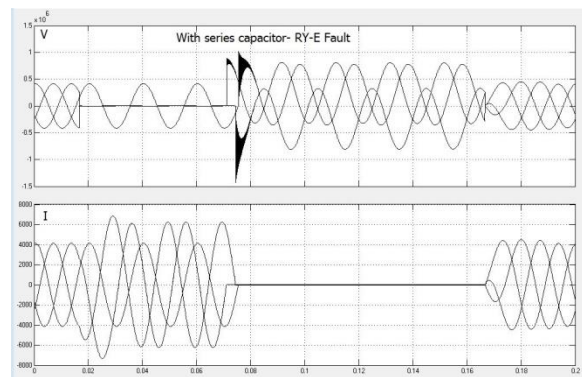


Fig.8-Waveform of V & I with series capacitor

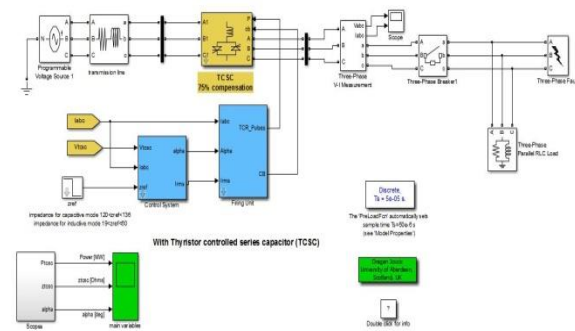


Fig. 6- simulink model of TCSC controller

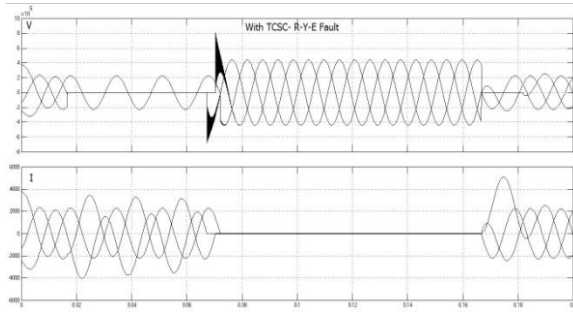


Fig.9- Waveform of V & I with TCSC

4. Measurement Results :

WITHOUT CAPACITOR		
1:	'UA: Three-Phase V-I Measurement'	231760.89 Vrms -51.64°
2:	'UB Three-Phase V-I Measurement'	231760.89 Vrms -171.64°
3:	'U C: Three-Phase V-I Measurement'	231760.89 Vrms 68.36°
4:	'U A:)1 '	231760.89 Vrms -51.64°
5:	'U B:)1 '	231760.89 Vrms -171.64°
6:	'U C:)1 '	231760.89 Vrms 68.36°
7:	'U A:)'	231760.89 Vrms -51.64°
8:	'U B:)'	231760.89 Vrms -171.64°
9:	'U C:)'	231760.89 Vrms 68.36°
10:	'I A:)'	2317.93 Arms - 52.21°
11:	'I A:)1 '	2317.93 Arms - 52.21°

12:	'I A: Three-Phase V-I Measurement'	2317.93 Arms - 52.21°
13:	'I B: Three-Phase V-I Measurement'	2317.93 Arms - 172.21°
14:	'I C: Three-Phase V-I Measurement'	2317.93 Arms 67.79°
15:	'I B:)1 '	2317.93 Arms - 172.21°
16:	'I C:)1 '	2317.93 Arms 67.79°
17:	'I B:)'	2317.93 Arms - 172.21°
18:	'I C:)'	2317.93 Arms 67.79°

WITH TCSC		
•1:	'U A: Three-Phase V-I Measurement'	377091.39 Vrms 4.55°
•2:	'U B: Three-Phase V-I Measurement'	377091.39 Vrms - 115.45°
•3:	'U C: Three-Phase V-I Measurement'	377091.39 Vrms 124.55°
•4:	'U A:)1 '	377091.39 Vrms 4.55°
•5:	'U B:)1 '	377091.39 Vrms - 115.45°
•6:	'U C:)1 '	377091.39 Vrms 124.55°
•7:	'U A:)'	658791.14 Vrms - 51.08°
•8:	'U B:)'	658791.14 Vrms - 171.08°

•9:	'U C:) '	658791.14 Vrms 68.92°
•10:	'U_TCR/Voltage Measurement '	543786.80 Vrms 94.00°
•11:	'U_TCR/Voltage Measurement1 '	543786.80 Vrms - 26.00°
•12:	'U_TCR/Voltage Measurement2 '	543786.80 Vrms - 146.00°
•13:	'I A:) '	3771.44 Arms 3.97°
•14:	'I A:)1 '	3771.44 Arms 3.97°
•15:	'I A: Three-Phase V-I Measurement'	3771.44 Arms 3.97°
•16:	'I B: Three-Phase V-I Measurement'	3771.44 Arms - 116.03°
•17:	'I C: Three-Phase V-I Measurement'	3771.44 Arms 123.97°
•18:	'I B:)1 '	3771.44 Arms - 116.03°
•19:	'I C:)1 '	3771.44 Arms 123.97°
•20:	'I B:) '	3771.44 Arms - 116.03 °
•21:	'I C:) '	3771.44 Arms 123.97 °
•22:	'I_TCR/Current Measurement '	17.04 Arms 179.51°

5. Conclusion :

Comparison of these above waveforms clearly shows a substantial increase in the transient stability margin in the system with TCSC. Controlled series compensation can be applied effectively to damp power system oscillations. For power oscillation damping it is necessary to vary the applied compensation so as to counteract the acceleration and decelerating swings on the disturbed machines. That is, when the rotationally oscillating generator accelerates and angle δ increases, the electric power transmitted must be increased to compensate for the excess mechanical input power. Conversely, when the generator decelerates and the angle, the electric power must be decreased to balance the insufficient mechanical input power. Fixed series compensation is self-adaptive to load change and has a compensation effect to heavy load line, but light load line with high load fluctuation may cause abnormal voltage rise in front the compensation point, that needs setting reasonable rules to switch series capacitor.

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A study of NPA and Higher Education Loan Komal Rawat

Assistant Professor Dept. of Commerce
St. Aloysius College Jabalpur (M.P.)
India

ABSTRACT

Education is a key to solve various problems of life. Human capital, particularly with higher education, increases labour productivity and individuals' income and that of the economy. Hence, it is necessary to develop an education system which generates human capital for achieving social and economic development. Education is becoming a costly affair today. It is met by the public and private sector banks through educational loan system. The current paper discusses the growth of Education Loan provided by Banks and its annual growth rate in India. The paper is based on the 6 years, (2011-2016) non-performing asset data of various public and private sector banks. The main objective of the study is to find out the basic concepts of NPA. This paper also focuses on the reason behind the NPA and ways to tackle it. The paper concludes with recommendations on enhancing the utility of the educational loans to improve access and employability of the students.

1.1 INTRODUCTION

Education has a significant role in the Indian Economy. Education is not only a tool for making money – it can be good for our hearts and souls as well, and help us figure out how we want to live. Education can also be defined as the process of becoming an educated. If a person is educated that impacts in the human development economic growth and it also makes a person very responsible and a proper citizen, he/she will be given respect in the society so by educating we can eradicate poverty and can live a peaceful life. But Higher Education is increasing with the new paradigm. Education is becoming very costly in recent time. The fee structures followed by different institutions are different and higher. Mostly students cannot afford the costly education. Education becomes more purposeful when the student has to complete his/her studies to acquire the capacity to repay the loan. Employability of the student after completing the

course becomes important and therefore educational standards will have to go up.

Banks are playing a vital role in fulfilling the financial needs of people for Education. Different schemes are offered to lend the finance for Higher Education. Banks are facing the problem due to non-payment of loan amount by borrower. This default is known as Non-Performing Assets. This is a burning topic of concern for the public as well as private sector banks, as managing and controlling NPA is very important.

1.2 Research Methodology

The study is based on secondary data obtained from the annual reports, publications and accounts of various public and private sector banks and other related publications. Some information was collected from books. The banks were purposively selected based on data

availability from 2010-11 to 2015-16, and the consistency of identity between the periods. The study made use of descriptive statistics of trend analysis, percentage growth and averages to examine the performance of the banks.

This study is divided in to eight parts-the above being the introduction, the second part is research methodology, the third part gives the literature review. The fourth part is the conceptual framework of Non-performing assets. The fifth part is role of banks in Higher Education Loan. NPA in Higher Education Loan was elaborated in sixth part. The research suggestions and recommendation was in part seven and conclusions are given in part eight.

Objective of the study

- To identify the growth of Education Loan in India.
- To discuss the conceptual framework of Non-Performing Assets.
- To study the status of NPA in Education Loan of scheduled commercial Banks in India.
- To make appropriate suggestions to avoid future NPAs.

Limitation of study

Some important limitations are as follows:-

- The study of research is limited only to Indian Banks.
- The time period of study is only between the financial year 2010-16 on the public and private sector banks.
- NPA was only considered for Education Loan.

1.1 Review of Literature

S. S. Kohli (2004) concluded in his study that bank can revised their fixed rate loans higher, this is a risk management exercise to safeguard their asset, liability management. But a firming up to

lending rates can only be witnessed of the RBI increases the bank rate. He analyzed the higher education system of India and its Growth over the years 1947-48 to 2009-10 which indicates the rapid growth and increasing demand for higher education in India so that's why the enrolment of students for higher education has increased.

The study also indicates that Enrolment by women is less than the national share of 39.4 per cent in large number of states. He compared states like Maharashtra, Andhra Pradesh, West Bengal, and Uttar Pradesh and found that women enrolment is less than the national ratio. This issue needs to be addressed by increasing the number of women enrolling for higher education. State-wise GER (Girl Enrollment Ratio) for the year 2002-03 indicates that the number of people attending higher education is very less, as GER at all-India level is around 9 per cent. The state-wise picture reveals that Goa recorded a higher GER followed by Manipur, Himachal Pradesh, Maharashtra, Uttaranchal and others. But, in states like Nagaland, Jammu & Kashmir, Tripura and others the GER is very low. This lower participation in higher education results in lower human capital formation.

B. Navaneetha (2014) opined that Higher education involves creation of intellects of world standards and also training of skilled human power at mass level without compromising on quality. Education has become a costly affair recently. He defined the importance of public sector banks as well as private sector to provide the financial needs to students. In his study, the procedure of SBI was identified and suggestions given for improving bank services. He analyzed various relations between Age, No. of Family members, No. of Earning members, and Monthly family income of respondents with level of satisfaction. The study reveals that the students

studying in professional college are obtaining. There is significant relationship found between the monthly family income of the respondents and the level of satisfy action.

The researcher found that some special initiatives should be started for government aided colleges for the highest benefit of students. Parents involvement can also be done to know better about the satisfaction level because when students take Education Loan so it impacts the socio-economic life of parents also. Researcher suggests that some information can also be gathered from the students who have completed their education and doing job.

Sulagna Das and Abhijit Dutta (2014) expressed the importance of Non-Performing Assets as a burning topic of concern for the public sector banks, as managing and controlling NPA is very important. They with the help of secondary data, from RBI website, tried to analyse the 6 years, (2008-2013) net non-performing asset data of 26 public sector banks, by using Annova statistics, and with the help of SPSS software. The main objective of the study is to find out if there are any significant differences in the mean variation of the concerned banks. The paper also focused on the reason behind the NPA and its impact on banking operations.

The study was done on the State Bank of India and its associates, and the other public sector banks. An attempt was made to analyze the data, through statistical tool, ANOVA. The main objective of the study was to find out whether there is any difference in the NPA occurrence between the various banks during the period of the study. The study finds out that there is no significant deference between the means of NPA of the banks at five percent level of significance. Hence one can safely conclude that banks

irrespective of their operations have similar NPAs in the recent years.

Dutta. A (2014): This paper studied the growth of NPA in the public and private sector banks in India , and analysed sector wise non-performing assets of the commercial banks. For the purpose of the study data has been collected from secondary sources such as report on Trend and Progress of Banking in India, RBI, Report on Currency and Finance, RBI Economic Surveys of India.

Das, S. (2010): In this paper the author has tried to analyse the parameters which are actually the reasons of NPAs, and those are, market failure, willful defaults, poor follow-up and supervision, non-cooperation from banks, poor Legal framework, lack of entrepreneurial skills, and diversion of funds.

Vivek Rajbahadur Singh (2016) asserted on growth of Non-Performing Assets in Commercial Banks that has a direct impact on profitability of banks. Some steps have been taken to solve the problem of old NPAs in the balance sheets of the banks. He suggested to have a systematic evaluation of the best way of tackling the problem. A high level of NPAs suggests high probability of a large number of credit defaults that affect the profitability and net-worth of banks and also erodes the value of the asset. NPAs affect the liquidity and profitability, in addition to posing threat on quality of asset and survival of banks. The problem of NPAs is not only affecting the banks but also the whole economy. Although various steps have been taken by government to reduce the NPAs but still a lot needs to be done to curb this problem.

1.4 Non-Performing Assets (NPA)

NPA indicates the amount of loan that was not returned by the customer for a period of 90

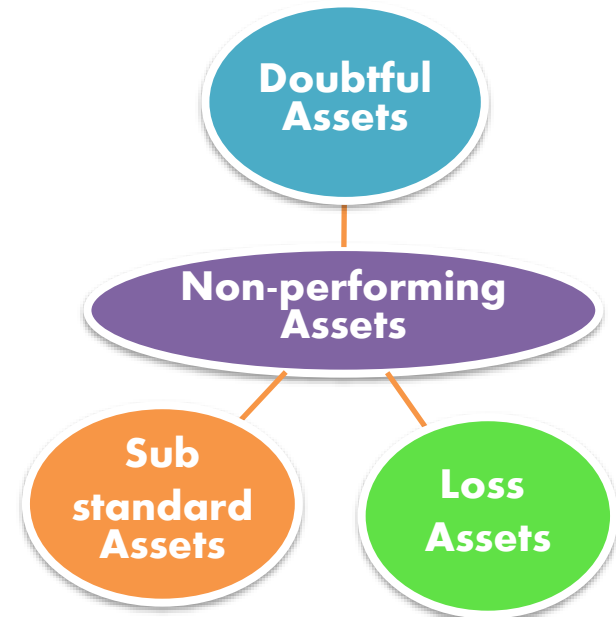
days. An asset becomes non-performing when it ceases to generate income for the bank.

Definition of NPA by RBI

- a) An asset, including a leased asset, becomes non-performing when it ceases to generate income for the bank. A 'non-performing asset' (NPA) was defined as a credit facility in respect of which the interest and/ or installment of principal has remained 'past due' for a specified period of time.
- b) a non-performing asset (NPA) shall be a loan or an advance where;
 - i. interest and/ or installment of principal remain overdue for a period of more than 90 days in respect of a term loan,
 - ii. the account remains 'out of order' as indicated at below, in respect of an Overdraft/Cash Credit (OD/CC),
 - iii. the bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted,
 - iv. the installment of principal or interest there on remains overdue for two crop seasons for short duration crops,
 - v. the installment of principal or interest there on remains overdue for one crop season for long duration crops,
 - vi. the amount of liquidity facility remains outstanding for more than 90 days, in respect of a securitization transaction undertaken in terms of guidelines on securitization dated February 1, 2006.
 - vii. in respect of derivative transactions, the overdue receivables representing positive mark-to-market value of a derivative contract, if these remain unpaid for a period of 90 days from the specified due date for payment.

Banks should, classify an account as NPA only if the interest due and charged during any quarter

is not serviced fully within 90 days from the end of the quarter.



c) 'Out of Order' status

An account should be treated as 'out of order' if the outstanding balance remains continuously in excess of the sanctioned limit/drawing power. In cases where the outstanding balance in the principal operating account is less than the sanctioned limit/drawing power, but there are no credits continuously for 90 days as on the date of Balance Sheet or credits are not enough to cover the interest debited during the same period, these accounts should be treated as 'out of order'.

d) 'Overdue'

Any amount due to the bank under any credit facility is 'overdue' if it is not paid on the due date fixed by the bank.

Classification of NPA

Non-performing assets are classified into three categories as given below:

- ➔ Substandard Assets
- ➔ Doubtful Assets
- ➔ Loss Assets

Substandard Assets

With effect from 31 March 2005, a substandard asset would be one, which has remained NPA for a period less than or equal to 12 months. In such cases, the current net worth of the borrower/guarantor or the current market value of the security charged is not enough to ensure recovery of the dues to the banks in full. In other words, such an asset will have well defined credit weaknesses that jeopardize the liquidation of the debt and are characterized by the distinct possibility that the banks will sustain some loss, if deficiencies are not corrected.

Doubtful Assets

With effect from March 31, 2005, an asset would be classified as doubtful if it has remained in the substandard category for a period of 12 months. A loan classified as doubtful has all the weaknesses inherent in assets that were classified as substandard, with the added characteristic that the weaknesses make collection or liquidation in full, – on the basis of currently known facts, conditions and values – highly questionable and improbable.

Loss Assets

A loss asset is one where loss has been identified by the bank or internal or external auditors or the RBI inspection but the amount has not been written off wholly. In other words, such an asset is considered uncollectible and of such little value that its continuance as a bankable asset is not warranted although there may be some salvage or recovery value.

1.5 Role of Banks in Higher Education Loan

Banks have become a part and parcel of our life. There was a time when the dwellers of city alone could enjoy their services. Now banks offer access to even a common man and their activities extend to areas hitherto untouched. Apart from their traditional business oriented functions, they have now come out to fulfill national responsibilities. Banks cater to the needs of the students for their higher education agriculturists, industrialists, traders and all other sections of the society.

Education Loan is a term loan granted to Indian Nationals for pursuing higher education in India or abroad where admission has been secured is called Higher Education Loan or Student Loan. Higher Education involves creation of intellects of world standards and also training of skilled human power at mass level without comprising on quality. But Higher Education is increasing with the new paradigm. Education is becoming very costly in recent time. The fee structure followed by different institutions are different and higher. Mostly students cannot afford the costly education. There are many Private and Public sector banks which offer the Education Loan. The purpose of Education Loan is to extend financial assistance to all eligible / deserving /meritorious students for pursuing higher education in India & in Abroad.

Table 1: List of Banks providing Education Loan

S. No.	Public Sector Banks	S. No.	Private Sector Banks
1.	<u>Andhra Bank</u>	1.	Axis Bank
2.	<u>Allahabad Bank</u>	2.	<u>Bassein Catholic Bank</u>
3.	<u>Bank of Baroda</u>	3.	<u>Catholic Syrian Bank</u>
4.	<u>Bank Of India</u>	4.	<u>City Union Bank</u>
5.	<u>Bank of Maharashtra</u>	5.	<u>Development Credit Bank</u>
6.	<u>Canara Bank</u>	6.	<u>Dhanalakshmi Bank</u>
7.	<u>Central Bank of India</u>	7.	<u>Federal Bank</u>
8.	<u>Corporation Bank</u>	8.	<u>HDFC Bank</u>
9.	<u>Dena Bank</u>	9.	<u>ICICI Bank</u>
10.	<u>Indian Bank</u>	10.	<u>Jammu & Kashmir Bank</u>
11.	<u>Indian Overseas Bank</u>	11.	<u>Karnataka Bank</u>
12.	<u>IDBI Bank</u>	12.	<u>Karur Vyasa Bank</u>
13.	<u>Oriental Bank of Commerce</u>	13.	<u>Lakshmi Vilas Bank</u>
14.	<u>Punjab & Sind Bank</u>	14.	<u>Ratnakar Bank</u>
15.	<u>Punjab National Bank</u>	15.	<u>South Indian Bank</u>
16.	<u>State Bank of India</u>	16.	<u>Tamilnad Mercantile Bank Ltd</u>
17.	<u>Syndicate Bank</u>		
18.	<u>UCO Bank</u>		
19.	<u>Union Bank of India</u>		
20.	<u>United Bank of India</u>		
21.	<u>Vijaya Bank</u>		

Source: https://www.successcds.net/Educationloan/Education_loan_Banks.htm

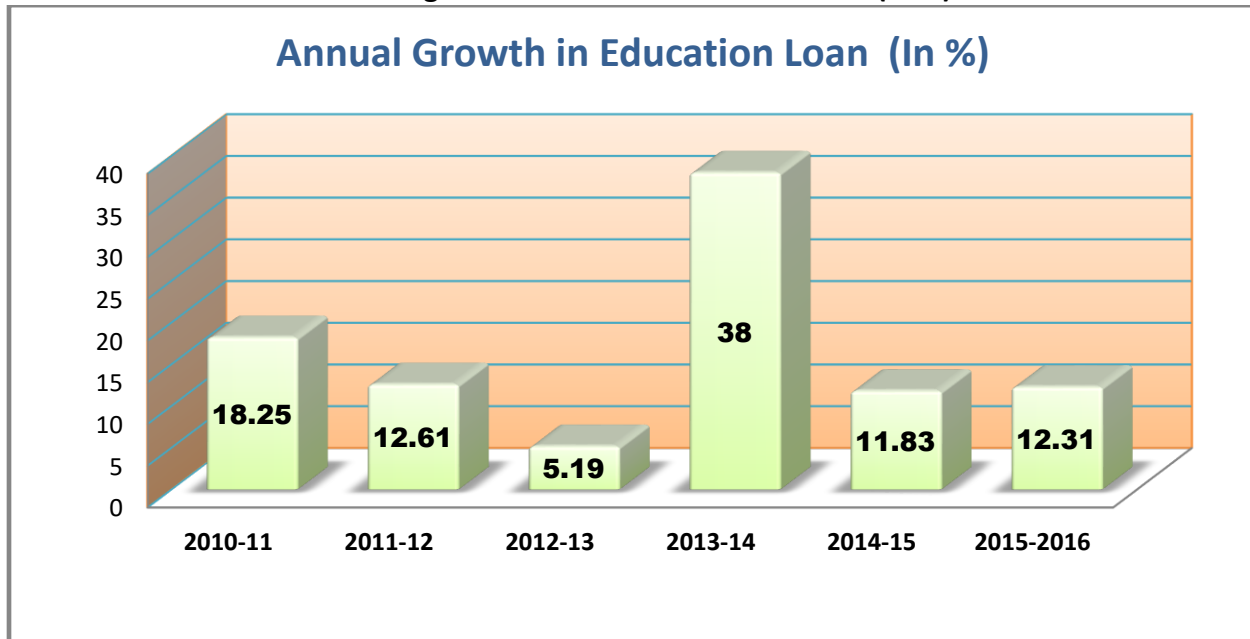
Table 2: Growth of Education Loan

S. No.	Year	Education Loan Amount (In Crore)	Annual Growth in Education Loan (In crore)	Total no. of A/c (In thousand)	Annual Growth in Education Loan A/c (In thousand)
1.	2010-11	42996	6636	2237	309
2.	2011-12	48416	5420	2461	224
3.	2012-13	50927	2511	2510	49
4.	2013-14	70282	19355	2573	63
5.	2014-15	78595	8313	2569	4
6.	2015-16	88269	9674	2435	-134

Source: Banking statistics relating to Banks, RBI Reports

As the table shows that Public as well as private sector banks are playing a vital role in providing Higher Education Loan. The performance of commercial banks under Education Loan disbursement process can be assessed by the data given in table above. The table shows the data regarding the total Education Loan amount, annual growth in Education Loan amount, No. of Education Loan accounts and its annual growth. In 2010-11 no. of beneficiaries of Education loan were 2,23,700 which was increased to 2,43,500 during the last 6 years with Loan amount Rs. 42,996 crore to Rs. 88,269 crore respectively. We can see in table that every year the no. of beneficiaries is increasing over previous year except 2015-16 which is a good sign for the people who are unable to afford high cost education in present time.

Figure 1: Growth of Education Loan (In %)



Source: Banking statistics relating to Banks, RBI Reports

In figure 1 the annual growth of Education Loan was shown. In 2010-11 the annual growth in Education Loan was 18.25% which decreases to 12.61% in 2011-12 and 5.19% in 2012-13. In 2013-14 it increases to 38% but decreased to 11.83% in 2014-15 and increased to 12.31% in the year 2015-16.

1.6 NPA in Education Loan

Table shows bad side of Education Loan during last 6 Years. The outstanding amount of Education Loan during last six years is continuously increasing. Students are availing loan but not paying on time. The outstanding Education Loan amount was Rs. 43,074 crore, 49,800 crore, 55,044 crore, 59,834 crore, 62,244 crore and 68,133 crore in 2011, 2012, 2013, 2014, 2015 and 2016 respectively.

The Non-performing asset (NPA) which borrowers have defaulted in on payments for more than 90 days in the segment of Education Loan in percentage of total Education Loan is constantly increasing.

The default rate in repayment rate was 3.71 in 2011, which rose to 4.5 in 2012, in 2013 again it increased to 5.4 and 5.75 in 2014, in 2015 it decreased to 5.44 in but increased to 7.35 in 2016.

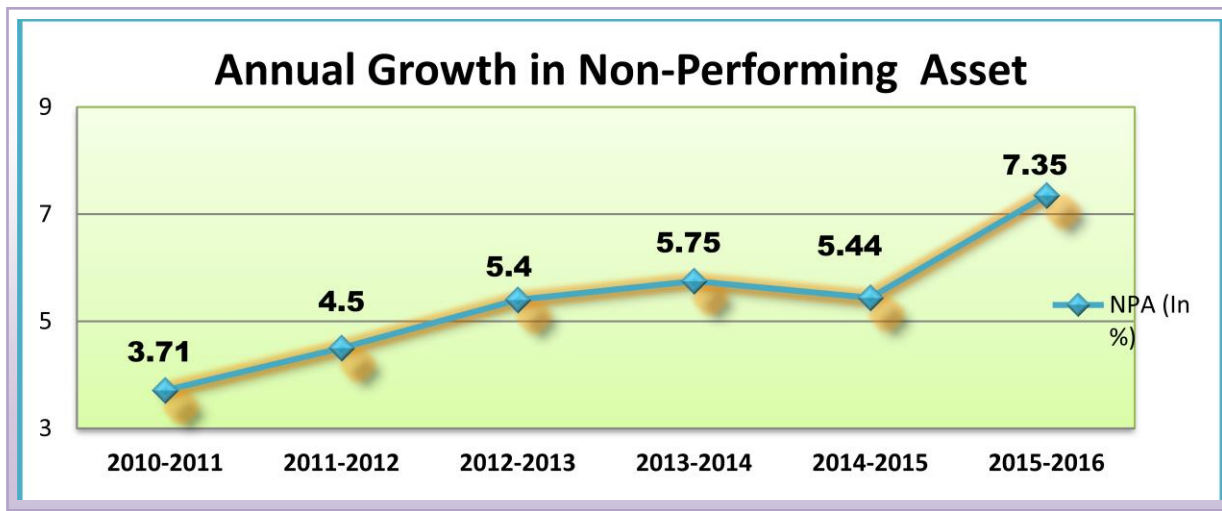
Table 3: Status of NPA in Higher Education Loan

S. No.	Year	Outstanding Amount (In Crore)	NPAs Amount (In Crore)	Annual Growth in NPA (In %)
1.	2010-2011	43074	1600	3.71
2.	2011-2012	49800	2241	4.5
3.	2012-2013	55044	2972	5.4
4.	2013-2014	59834	3439	5.75
5.	2014-2015	62244	3385	5.44
6.	2015-2016	68133	5006	7.35

Source: <https://www.bestcurrentaffairs.com/latest-data-npas-education-loans/>

Graph also indicates the NPA (Default) amount during the last 6 years 1,600 core, 2,241 crore, 2,972 crore, 3,439 crore, 3,385 crore and 5,006 crore in 2011, 2012, 2013, 2014, 2015 and 2016 respectively.

Figure 2: Status of NPA in Education Loan (In %)



Source: <https://www.bestcurrentaffairs.com/latest-data-npas-education-loans/>

In figure 2 NPA in Education Loan was shown by percentage over the period of 6 years. The trend presents an increasing direction of NPA. That means defaults in Education Loan are enhancing day by day that have an adverse impact on the profitability of Banks. In 2010-11 the annual growth of NPA was 3.71% which increased to 7.35% in 2015-16.

1.7 Suggestions and Recommendation

Education loan can be declared NPA by a bank once three consecutive EMIs go unpaid. Banks have distinct internal policies on handling NPA. Bank initiate legal proceedings against the borrower and the co-borrower. The bank may even take over the collateral, if any was submitted at the time of applying for Loan. Ideally, one should completely avoid defaulting debt repayments. It can severely damage one's CIBIL score, that way he or she will not be able to get any loans for bad credit score and their name will be registered in the bank's defaulter's list. If ever you need loans or credit card in future, the chances of you getting one will be bleak if you have unpaid (NPA) debts in your report. A poor CIBIL score literally cuts off access to credit in future. So everyone should act reliably and repay debts on time.

State Level Bankers' Committee (SLBC) Chairperson Usha Ananthasubramanian sent a strong message to banks in Punjab and Haryana when she told a committee meeting that, "The non-performing assets level is certainly on the higher side in case of education loan advanced collateral free. Only the meritorious rather than the deserving candidates should be considered for granting education loan."

Banks are required to make provisions for NPA to avoid the stoppage of income generation. Therefore, NPA is a double edged razor; damaging the profit, weakening the capital structure and reducing the rating of bank. Following steps may be taken by banks to tackle the problems of rising defaults.

1. Stringent NPA recovery rules

The government has over the years enacted and tweaked stringent rules to recover assets of defaulters. The Securitization and Reconstruction of Financial Assets and Enforcement of Security

Interest Act or Sarfaesi Act of 2002 was amended in 2016 as it took banks years to recover the assets. Experts have pointed out that the NPA problem has to be tackled before the time a borrower starts defaulting. This needs a risk assessment by the lenders and red-flagging the early signs of a possible default.

2. Reasonable recovery approach

The loan mechanism needs more reasonable approach so that all potential brilliant students are benefitted by the funding and not pushed to crisis before even their professional life begins. That means time to time follow-up should be taken regarding various information like relocation of borrower, change in mobile no., change in job and performance of borrower. The credit should be monitored effectively. Banks must initiate appropriate responses wherever early warning signals are seen.

3. Legal action

If the education loan account becomes NPA due to non-payment of interest and installment banks will resort to legal remedy to recover the dues including filing of suits against the borrower and guarantors for non-payment of dues. Legal action also includes recovery through Lok Adalat, DRT, SARFAESI proceedings, Filing Civil suit.

4. Qualitative appraisal of financial statements

At the time of sanctioning the Education Loan banks demand for financial statements of last 6 months and borrower is required to submit it. To reduce the NPA Banks need to appraise qualitatively the statements and make sure that there will be less chance of default.

5. Insurance

This is a new concept in Education Loan that now the banks are taking initiative for doing insurance of borrower of Education Loan. This will minimize

the risk factor for banks because in any case if the borrower will not repay the debt the insurance company will pay the sum assured.

6. Periodic assessment

There is a need to make periodic assessment of the health of the advances by noting some of the key indicators of performance of borrowers like academic records, activity level, family conditions and management of the unit and ensure that the loan given are effectively utilized for productive purposes and are well maintained. To identify early warning signals, if any, and initiate remedial measures.

7. Academic progress

Monitoring academic progress of student is really very necessary for banks to ensure asset quality of loans though subsequent installments can't be stopped for the mere reason that the student has not got any employment opportunity due to bad academic records. Banks may require from students to submit a certificate from institutes about the continuous academic progress. Students can approach their institutes to issue such a 'progressive certificate'.

1.8 Conclusion

India has been ranked fifth on the list of countries with highest Non-Performing Assets (NPAs) with a ratio of 9.9%, and is on top spot among the BRICS nations, a recent report by CARE Ratings revealed. A Non-performing asset (NPA) is *defined* as a credit facility in respect of which the interest and/or installment of Bond finance principal has remained 'past due' for a specified period of time. The current study deals with the types of NPA and the causes behind its growth. The paper analyzed the NPA in terms of Education Loan and find that NPA is increasing over the period of last 6 years. An attempt was made to highlight the role of public and private sector banks in providing Higher Education Loan.

A study was based on the secondary data, from the annual reports, of 6 years starting from 2011 to 2016. The paper concludes with the strategies and suggestions to reduce the NPA rate in Education Loan.

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