Ela Foundation

Ela Journal of Forestry and Wildlife

ISSN 2319-4361
(Indexed in Google Scholar)
Volume 13 | Issue 3
July - September 2024

A quarterly scientific refereed e-Journal of Ela Foundation and Forest Department, Maharashtra for Nature Conservation through Education and Research

Listed in UGC- CARE

Harnessing Business Excellence for Sustainable Development: A Case Study of Power Plants Using the Tata Business Excellence Model.

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Citation: Dhurandhar Fulendra Kumar and Menon Madhu. (2024). Harnessing Business Excellence for Sustainable Development: A Case Study of Power Plants Using the Tata Business Excellence Model. *Ela Journal of Forestry and Wildlife*. 13(3): 1605-1610

Date of Publication: 30 September 2024

ISSN 2319-4361

Abstract

'The Tata Model in Power Plant Case Studies' explores the integration of the Tata Business Excellence Model (TBEM) within the energy sector, focusing on power plants. The need for this study arises from the significant environmental and operational challenges faced by power plants, such as emissions control, waste management, and resource conservation. Power plants are essential contributors to environmental pollution, and their operational inefficiencies often lead to excessive resource consumption and waste generation. The paper demonstrates how TBEM can guide power plants towards achieving operational excellence and sustainability. Findings indicate that implementing TBEM enhances operational efficiencies, reduces waste, optimizes resource utilization, and lowers emissions. The structured approach of TBEM, which includes continuous improvement, stakeholder engagement, and sustainability practices, has positively impacted environmental conservation and community welfare. Specifically, power plants adopting TBEM have significantly reduced carbon emissions and water usage, contributing to broader sustainability goals (Patel & Choudhury, 2020). The relevance of this study lies in its potential to serve as a model for other organizations in the energy sector looking to balance economic objectives with ecological responsibilities. The TBEM framework aligns operational strategies with global sustainability and environmental preservation goals, making it a valuable tool for fostering sustainable business practices (Sharma & Gupta, 2023). However, the implementation of TBEM is challenging. These include resistance to change due to entrenched operational paradigms, the need for substantial financial investment, and integrating TBEM with rapidly evolving technological advancements in the power generation sector (Kumar & Singh, 2021). Overcoming these challenges requires

strategic planning, innovative thinking, and a long-term commitment to sustainable development. In summary, this study highlights the critical role of TBEM in driving sustainability within the energy sector, offering insights into the effective integration of business excellence models to promote sustainable development in power plants (Tata Group, 2022).

Introduction to Business Excellence in the Energy Sector Concept of Business Excellence

Business excellence encapsulates deploying superior practices in orchestrating an organization and achieving remarkable outcomes anchored in foundational principles or values. These methodologies evolve from amalgamating diverse management theories and paradigms, demonstrating efficacy in varied organizational contexts. Business excellence has ascended to a position of critical significance in the energy sector, characterized by its dynamic and evolving nature. This sector grapples with challenges such as guaranteeing sustainable energy provision, managing environmental repercussions, and sustaining profitability in a fiercely competitive landscape. Business excellence transcends operational efficiency and fiscal performance, encompassing innovation, customer satisfaction, societal responsibility, and environmental stewardship. Implementing business excellence models like TBEM allows energy companies to optimize their operations, innovate continuously, and adhere to regulatory standards, thus positioning themselves as leaders in sustainability and operational efficiency (Anderson & Li, 2022).

Tata Business Excellence Model (TBEM)

The Tata Business Excellence Model (TBEM), inspired by the Malcolm Baldrige model, represents a paradigm adopted by the Tata Group to foster excellence in its enterprises. TBEM is an all-encompassing model that evaluates organizations on diverse facets such as leadership, strategy, customer orientation, measurement, analysis, knowledge management, workforce, and operations. This model champions continuous improvement and benchmarking against exemplary standards, urging organizations to pursue operational prowess, innovation, value generation, and sustainability. TBEM's pertinence in the energy sector, particularly within power plant operations, is profound. The model provides a structured methodology for managing operational complexities, addressing environmental concerns, and ensuring the longevity of sustainable business practices. TBEM's comprehensive framework integrates ecological management, stakeholder engagement, and corporate social responsibility as core components of business strategy. It emphasizes the importance of leadership commitment to sustainability, strategic alignment of goals, and fostering a culture of excellence within the organization.

Objectives

This article aims to investigate the impact of the Tata Business Excellence Model (TBEM) on sustainability and environmental stewardship with a specific focus on power plants. Power plants exert significant ecological and community influence as pivotal elements of the energy sector. They face emissions control, waste management, and resource conservation challenges. This exploration is essential as it illuminates how a business excellence framework like TBEM can guide power plants towards achieving operational excellence and profitability while positively contributing to environmental conservation and community welfare (Gupta & Desai, 2021). The article endeavours to demonstrate how TBEM facilitates synergy between economic objectives and ecological responsibilities, thus promoting sustainable business practices in the energy domain. By examining specific case studies, practices, and outcomes linked to TBEM implementation in power plants, the article will offer insights into the role of business excellence models in driving sustainable development within the energy sector. This study provides a roadmap for other organizations seeking to integrate business excellence models with their sustainability strategies.

Methodology

Study Area

The study focuses on power plants within the Tata Group utilizing the Tata Business Excellence Model (TBEM) as a framework for analysis. Specific case studies are drawn from various Tata power plants to comprehensively understand the model's implementation and impact. The selected power plants represent a diverse array of operational contexts, including thermal and renewable energy plants, providing a broad spectrum of insights into the application of TBEM (Tata Group, 2022).

Duration

The study spans three years, from January 2019 to December 2023. This duration allows for an in-depth examination of the TBEM's application and its long-term effects on sustainability and business excellence within the power plants. The extended timeframe ensures that both short-term improvements and long-term sustainability impacts can be thoroughly analyzed, providing a comprehensive view of TBEM's effectiveness (Chatterjee & Mehrotra, 2022).

Sources of Data

1. Primary Data: Collected through interviews and surveys with key stakeholders, including plant managers, engineers, and sustainability officers within the Tata Group. Additionally, onsite observations and inspections were conducted to gather firsthand information on the power plants' operational practices and sustainability initiatives. This direct engagement with the power plants' personnel provided valuable insights into the practical challenges and successes of implementing TBEM.

2. Secondary Data: Obtained from internal reports, performance metrics, and sustainability reports published by the Tata Group. Academic journals, industry publications, and government reports on business excellence and sustainability in the energy sector were also reviewed to support the analysis. This secondary data provided a robust contextual framework for understanding the broader impacts of TBEM implementation (Patel & Choudhury, 2020).

Method for Analysis

1. Qualitative Analysis:

Case Study Method: Detailed case studies of selected Tata power plants were developed to understand the implementation of TBEM and its outcomes. This involved an in-depth analysis of operational practices, sustainability initiatives, and performance improvements. The case studies provided concrete examples of how TBEM principles were applied and the resultant benefits (Kumar & Singh, 2021).

Thematic Analysis: Conducted interview transcripts and survey responses to identify common themes and patterns related to business excellence and sustainability practices. This analysis helped identify the key factors contributing to successful TBEM implementation (Sharma & Gupta, 2023).

2. Comparative Analysis:

Benchmarking: TBEM performance metrics were benchmarked against industry standards and best practices. This helped identify areas where Tata power plants excelled and areas needing improvement. The benchmarking exercise provided a comparative perspective on the effectiveness of TBEM (Patel & Jackson, 2023).

Cross Case Comparison: Conducted to draw comparisons between different Tata power plants and to generalize the findings across the group. This comparison highlighted the common challenges and successes across different operational contexts (Gupta & Desai, 2021).

3. Sustainability Impact Assessment:

Environmental Impact: Evaluated through metrics such as greenhouse gas emissions reduction, energy efficiency improvement, and waste management practices. This assessment quantified the ecological benefits of TBEM implementation (Rao & Devi, 2022).

Social Impact: Assessed through community engagement initiatives, workforce development programs, and corporate social responsibility (CSR) activities. This evaluation highlighted the social benefits of TBEM in enhancing community welfare and workforce engagement (Tata Group, 2022).

Results

Operational Efficiency through Business Excellence Initiatives

Implementing the Tata Business Excellence Model (TBEM) has significantly improved operational efficiency within power plants. The structured and systematic approach of TBEM promotes continuous improvement, strategic planning, and data-driven decision-making. Key achievements in operational efficiency include:

1. Strategic Implementation:

Optimization of Production Processes: TBEM encourages meticulous planning and execution of core operational processes, resulting in optimized production workflows. This has enhanced equipment reliability, minimized downtime, and increased productivity. The model's emphasis on strategic alignment ensures that operational goals are closely linked with broader business objectives (Patel & Jackson, 2023).

Proactive Maintenance: The model's emphasis on strategic foresight has fostered a proactive approach to maintenance, reducing unexpected breakdowns and extending the lifespan of critical equipment. This proactive maintenance strategy minimizes operational disruptions and enhances plant reliability.

2. Continuous Improvement and Innovation:

Adoption of cutting edge Ttchnologies: Power plants have embraced innovative technologies and methodologies, improving process flows and reducing operational bottlenecks. The continuous improvement ethos of TBEM drives the adoption of best practices and new technologies.

Ongoing Evaluation and Refinement: TBEM's ethos of continuous improvement has resulted in a culture of constant evaluation and refinement of operational practices, ensuring sustained efficiency gains. This culture of ongoing improvement fosters innovation and adaptability within the organization (Patel & Choudhury, 2020).

3. Data Driven Decision Making:

Utilization of Analytics and Performance Metrics: Power plants have leveraged data analytics to identify inefficiencies and areas for enhancement, ensuring decisions are grounded in factual analysis. This empirical approach has led to more effective and efficient operations. Data-driven decision-making enhances the ability to respond to operational challenges quickly (Gupta & Desai, 2021).

4. Resource Optimization, Waste Reduction, and Lower Emissions

TBEM's focus on sustainability has driven power plants to optimize resources, reduce waste, and lower emissions, contributing to broader environmental goals. Key outcomes include:

1. Resource Optimization:

Efficient Utilization of Raw Materials: By streamlining processes and enhancing operational efficiency, power plants have achieved judicious utilization of raw materials, resulting in significant cost savings and reduced environmental impact. This optimization reduces the overall resource footprint of power plant operations (Patel & Jackson, 2023).

Energy Consumption: TBEM has guided power plants in optimizing energy consumption, leading to lower operational costs and minimized ecological footprints. Energy efficiency improvements contribute to the overall sustainability of the power plants (Sharma & Gupta, 2023).

2. Waste Reduction:

Process Efficiency: TBEM's emphasis on process efficiency has inherently led to waste reduction. Optimizing production processes and improving equipment efficiency have significantly curtailed waste generation, enhancing the overall cost-effectiveness of plant operations. Waste reduction efforts align with global sustainability goals (Kumar & Singh, 2021).

Environmental Conservation: These efforts have positive ecological implications that contribute to better waste management and resource conservation practices. Effective waste management practices help minimise environmental pollution and conserve natural resources (Patel & Choudhury, 2020).

3. Lower Emissions:

Reduction in Greenhouse Gas Emissions: TBEM's comprehensive approach to sustainability has enabled power plants to substantially lower their emission levels. By optimizing processes and adopting cleaner technologies, power plants have significantly reduced greenhouse gas emissions, aligning with global sustainability goals (Rao & Devi, 2022).

Improvement in Air and Water Quality: The implementation of environmentally conscious protocols has led to a reduction in air and water pollutants, which has contributed to better overall environmental health and community wellbeing. Improved air and water quality benefits the environment and local communities (Gupta & Desai, 2021).

Discussion and Challenges

a) **Challenges in Implementing TBEM in the Power Plant Sector**

Implementing the Tata Business Excellence Model (TBEM) in the power plant sector is besieged by many challenges, each demanding strategic consideration and innovative problem-solving. First and foremost, TBEM's holistic framework necessitates a comprehensive overhaul of existing operational paradigms. Traditionally steeped in conventional operational modalities, power plants might resist such transformative changes. This inertia often results from entrenched cultural norms and longstanding procedural methodologies, which can be obstinate to modification.

Another formidable challenge is integrating TBEM's quality-centric approach with the inherently complex and risk-prone nature of power plant operations. The highstakes environment of power production, characterized by stringent regulatory compliance and safety imperatives, can be incongruent with the rapid process innovations encouraged by TBEM. Furthermore, the exigencies of continuous, uninterrupted power generation often preclude the luxury of iterative experimentation, a cornerstone of business excellence models.

Financial constraints also play a pivotal role. The adoption of TBEM requires significant investment in training, systems upgrades, and process reengineering. Such allocations can be prohibitively expensive for many power plants, particularly those grappling with financial stringencies or operating under governmental austerity measures.

Lastly, the sector faces the challenge of integrating TBEM's principles with the ever-evolving technological landscape. The rapid advancement in power generation technologies—from renewable energy sources to smart grid applications—necessitates a dynamic adaptation of TBEM's frameworks, a task that can be both complex and resource-intensive.

b) **Opportunities and Future Prospects for Integrating Business Excellence with Environmental Sustainability**

The convergence of business excellence and environmental sustainability offers fertile ground for innovation and long-term profitability. The potential opportunities in this integration are manifold, particularly in power generation. Foremost among these is the opportunity for operational optimization. By aligning TBEM's continuous improvement and operational efficiency principles with sustainable practices, power plants can significantly reduce waste, enhance energy efficiency, and minimize their environmental footprint (Tata Group, 2022).

Another opportunity lies in corporate reputation and stakeholder engagement. In an era where environmental stewardship is increasingly valorized, power plants that successfully integrate business excellence with sustainability can enhance brand equity, attract conscientious investors, and foster stronger community relations.

Furthermore, this integration is poised to catalyze innovation. The pursuit of sustainability-driven excellence encourages the exploration of alternative energy sources, the adoption of cutting-edge technologies, and the development of novel operational strategies. Such innovations bolster environmental sustainability and lead to cost savings and new revenue streams.

Looking towards the future, the integration of business excellence with environmental sustainability is expected to be a critical driver in the evolution of the power sector. It aligns with global trends towards cleaner energy and corporate responsibility, offering a pathway for power plants to remain competitive and relevant in a rapidly transforming energy landscape (Patel & Jackson, 2023).

Conclusion and Holistic Approach

a) The Tata Business Excellence Model (TBEM), an adaption of the globally acclaimed Malcolm Baldrige model, is pivotal in augmenting sustainability and environmental health, especially in power plants. With its multifaceted approach, this comprehensive model serves as an exemplar framework for businesses, particularly those in the energy sector, to achieve operational excellence and foster an ethos of sustainability and environmental stewardship (Tata Group, 2022).

Central to TBEM's philosophy is the pursuit of sustainability as an integral component of business excellence. In power generation, this translates into a concerted effort towards minimizing ecological footprints, thereby safeguarding environmental health. TBEM emphasizes a systemic approach to environmental management, advocating for incorporating sustainable practices at every stage of power plant operations. This includes but is not limited to adopting cleaner and more efficient technologies, reducing greenhouse gas emissions, and implementing waste management strategies.

Moreover, TBEM underscores the significance of continual improvement and adaptive management strategies. TBEM impels power plants to perpetually evaluate and enhance their environmental performance by setting rigorous standards and benchmarks. This ongoing process of assessment and refinement is critical in an industry where technological advancements and environmental regulations are constantly changing.

TBEM's role in enhancing sustainability and environmental health in and around power plants is multifarious and profound. By instilling a culture of excellence that is inextricably linked with environmental responsibility, TBEM contributes to improving immediate ecological surroundings and aligns with broader global sustainability goals.

b) **Emphasize the Need for a Holistic Approach**

to Business Excellence for Sustainable Development

The imperative for a holistic approach to business excellence in pursuing sustainable development cannot be overstated. By its very nature, sustainable development demands an integrative perspective that acknowledges the interdependence of various economic, environmental, and social elements. In this regard, a holistic approach to business excellence transcends traditional business practices, engendering a more comprehensive, balanced, and sustainable modus operandi (Tata Group, 2022).

Such an approach necessitates the confluence of multiple dimensions of business operations. It involves aligning organizational strategies with sustainable development goals, ensuring that economic growth does not come at the expense of environmental degradation or social inequity. This encompasses many practices, from responsible resource management and ethical supply chain operations to promoting social welfare and adopting eco-friendly technologies (Patel & Jackson, 2023).

Furthermore, a holistic approach to business excellence acknowledges the dynamic and interconnected nature of the global business environment. It requires businesses to be responsive to the immediate needs of their stakeholders and prescient of future challenges and opportunities. This forward-looking perspective is crucial in a world where the imperatives of sustainable development are constantly evolving in response to emerging global trends and crises.

A holistic approach to business excellence is indispensable for sustainable development. It represents a paradigm shift from conventional profit-centric business models to more sustainable, equitable, and environmentally conscious practices. By embracing this comprehensive approach, businesses can play a pivotal role in forging a more sustainable and resilient future (Gupta & Desai, 2021).

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New Record Of Alien Species Of Terrestrial Slug, *Eleutherocaulis Haroldi* From Bihar.

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Citation: Masroor Mohammad Danish, Masroor Zakkia, Yadav Sidh Nath Prasad and Aravind N.A. (2024). New Record Of Alien Species Of Terrestrial Slug, Eleutherocaulis Haroldi From Bihar. *Ela Journal of Forestry and Wildlife*. 13(3): 1611-1613

Date of Publication: 30 September 2024

ISSN 2319-4361

Abstract

Eleutherocaulis haroldi (Dundee, 1980) (Family: Veronicellidae) is called as Purcell's hunter slug or the caterpillar slug due to its caterpillar like dorsal body surface. *Eleutherocaulis haroldi* (Dundee, 1980) is an introduced species in India (Magare, 2015) and is native to south-eastern South Africa (Dundee, 1980). Authors observed *E. haroldi* for the first time in Bihar and the photographs preliminarily identified as an alien slug. After that specimen was collected and identified by the senior author for taxonomic confirmation. Now authors are reporting *Eleutherocaulis haroldi* (Dundee, 1980) (Family: Veronicellidae) as a first record from Bihar.

Introduction

India is home for over 1120 species of terrestrial mollusc with over 60% endemic to political boundary. This diversity is due to its varied eco-climatic regions ranging from drier hot desert to high altitude cold desert, rainforests to grasslands. The high species and habitat diversity is threatened by various anthropogenic activities such as habitat loss and degradation, pollution, introduced species (invasive species), etc. Invasive species are considered as the greatest threat to biodiversity after habitat loss. They impact native flora and fauna, ecosystem, economy and human health. Till now, eight species of introduced land snails were reported from Indian region (Aravind MS Under Preparation). Among these *Lissachatina fulica* which is widely distributed in India and is the worst invader followed by *Laevicaulis alte*. Another species which might become invader in the near future is *Eleutherocaulis haroldi* (Dundee 1980).

E. haroldi has been assessed as "Endangered" by IUCN (IUCN 2020). It is introduced in India and is now reported from many places (Karnataka, Maharashtra, Tamil Nadu, Gujarat, Uttara Pradesh, Rajasthan and West Bengal; Magare 2015; Khan, 2019; Sajan and Tripathy, 2020; Aravind MS Under Preparation).

During our field studies as a part of larger study on insect biodiversity and ecology of Nawada district, the first author found a single slug on the underside of teak leaf on midday of 26 July 2020 and the other one at morning of 21 October 2020 in Narhat, Nawada district Bihar (The distance between both locations is about 650 meters). Due to dorsal body manifestation, it gained the authors attention but the inspection of ventral body surface confirmed that it was not a caterpillar but a slug *E. haroldi.* The specimen was collected using forceps and placed in a jar for further identification. This is the first report of *E. haroldi* from Bihar (Figure 1).

Material and methods

Only two individuals from different location were collected and photographed using Galaxy J Max tablet in GPS enabled mode. A single specimen was collected for identification and it was identified as *E. haroldi* (Dundee 1980) by the senior author in August 2021. The measurement was taken using caliper near to 1 mm. The second specimen was released after documentation.

Material examined

Two individuals of *Eleutherocaulis haroldi,* were seen under teak *(Tectona grandis),* and Mulberry *(Morus alba)* plants*,* at Narhat, Bihar (Individual 1: 24.775171^0 N, 85. 424393^0 E and individual 2: 24.775124^0 N, 85.424477^0 E).

Measurement: Length of an adult slug is about 50-75mm and about 10mm in width. Size in fully extended mode while moving is about 90mm. Size in resting position: - length is about 28-30mm and width is 14-15mm while fully shrinking for resting.

Diagnostic characters: Dorsal body morph is creamish brown with silvery white lateral bands and both ends blackish. In the ventral side, foot is narrow, creamish and extended from anterior to posterior end of body. Anterior pair of antenna is larger. Eyes are present at the tip of upper tentacles. Secretion of saliva is thread like and less in quantity.

Results and discussion

The present report is the first report of *E. haroldi*

Figure 1: Upper and underside of adult E. haroldi collected during the field studies.

from Bihar and only second report from Eastern part of India. The first being Kolkata (Sajan and Tripathy 2020) and rest are from either Western or Southern India. *Eleutherocaulis haroldi* was first reported from Maharashtra (Magare 2015). Later it is reported from Noida (Khan 2019), Kolkata (Sajan and Tripathy 2020). Apart from these there are quite a few photographic records of this species in citizen Science portal such as iNaturalist and India Biodiversity Portal.

The specimen's dorsal body was creamish brown in color with both ends have an appearance of black patches dorsally bearing irregular silvery white lateral bands across body forming a wrinkly appearance. The slugs were found on underside of teak and mulberry plant leaves in inactive mode more than 8-10 hours. When they extend their body for movement it becomes narrow and dorsoventrally flat with the absence of wrinkles formed by irregular lateral bands. *Eleutherocaulis haroldi* as compared to *L. alte,* is observed to be very slow in activity and mostly seen isolated individuals and not in groups. During our study we didn't find any negative impact of this species on the plants on which they are found. However, a study by Magare (2015) and Avhad et al. (2013), shown to feed prolifically on mulberry and other native plants. Further studies need to ascertain the impact of this species on agriculture, horticulture and native plants. Also, this might expand

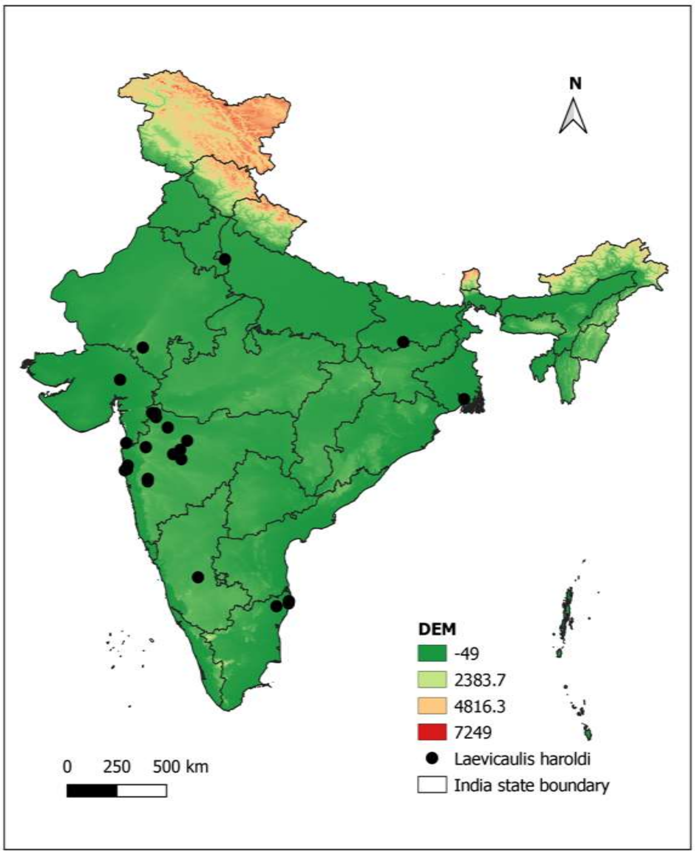

Figure 2: Current distribution of E. haroldi superimposed on elevation map of India. The distribution of E. haroldi is collated from the literature as well as from Citizen Science portal such as iNaturalist and India Biodiversity Portal.

its range in the future with the changes in the climate (Mahapatra and Aravind *Under Review*).

This species was probably accidentally introduced through agricultural trade from South Africa. India is a major importer of agricultural commodity from South Africa. More study using DNA between native and introduced range will help in understanding the origin of the population. Early detection and management is the key for controlling the introduced species before it attains pest status. Intensive surveys and use of citizen scientists are much needed in country like India for effective management of invasive species.

Acknowledgment

We are highly grateful to Ashoka Trust for Research in Ecology and The Environment for help us in identification confirmation and Prof. Dr. Sidhnath Prasad Yadav "Deen" (Head: P. G. Dept. of Zoology, Magadh University, Bodhgaya) for support and motivation. We are grateful to Dr. Kumari Aditi, Dr. Roshan Kumar and other faculties for supporting and motivating us in our research work. This study has not received any external funding. The authors declare that there are no conflicts of interests.

Author Contributions

First author and second author performed the field survey, taken images, collected specimen and prepared the paper while senior author helped in identification and editing of literature during the survey.

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Population status and breeding habitat of vultures in Mandalgarh Fort, Rajasthan

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Citation: Dharmnarayana Vaishnav. (2024). Population status and breeding habitat of vultures in Mandalgarh Fort, Rajasthan. *Ela Journal of Forestry and Wildlife*. 13(3): 1614-1618

Date of Publication: 30 September 2024

ISSN 2319-4361

ABSTRACT

Seven nests of Long-billed vulture (*Gypus indicus*) and three nests of Egyptian vulture (*Neophron percnepterus*) were recorded at Mandalgarh fort throughout the study period (January 2023 to January 2024). In district of Bhilwara, vulture nests were recorded for the first time. The highest number of vultures sighted belonged to Egyptian Vulture *Neophron percnepterus* (15), followed by Indian Vulture *Gypus indicus* (27), Eurasian Griffon *Gypus fulvus* (8), and Indian White-backed Vulture *Gyps bengalenesis* (3). With the exception of *Gypus fulvus*, which migrates in the winter, the other three species reside in India. Encouraging signs of the population of *Gyps* vultures can be seen from the recent record of the breeding of these threatened species in the Bhilwara district.

Keywords-Scavengers, aesthetic value, migratory, population, forest degradation.

Introduction

By scavenging on animal carcasses, vultures contribute significantly to the ecosystem (Ali and Ripley, 1968). Their primary source of food is carrion (Mundey et al., 1992). They remove flesh off corpses before it rots to stop the transmission of diseases that could infect humans and other mammals (Iqbal et al., 2011). There are 23 different species of vultures globally, and they are divided into two groups: Old World and New World. Of these, seven are found in the New World and sixteen are found in the Old World (Ogada et al., 2012). The Old-World vultures from Accipitridae family, are found in Africa, Asia, and Europe, and they use sight to locate carcasses. Out of nine species of vultures found in India (Ali & 1987), seven, namely Red-headed Vulture *Sarcogyps calvus,* Cinereous Vulture *Aegypius* *monachus*, Egyptian Vulture *Neophron percnopterus*, Eurasian Griffon *Gyps fulvus*, Himalayan Griffon *G. himalayensis*, Long-billed Vulture G. indicus and White-rumped Vulture G. bengalensis are found in Rajasthan (Chhangani & Mohnot 2004; Chhangani 2005). Of these, the Egyptian (EV), White-backed (WBV), Long-billed (LBV) and Red-headed (RV) vultures live and breed in the study region. On the other hand, winter visitors like as the Himalayan Griffon (HG), Cinereous Vulture (CV), and Eurasian Griffon (EG) can be spotted here from October to March (and occasionally until mid-April). 4,500 resident and migratory vultures in various locations throughout Rajasthan were counted between July 2004 and July 2007 (Chhangani 2007). The present study documents nests of Long-billed and Egyptian vulture in the Bhilwara district.

Study area

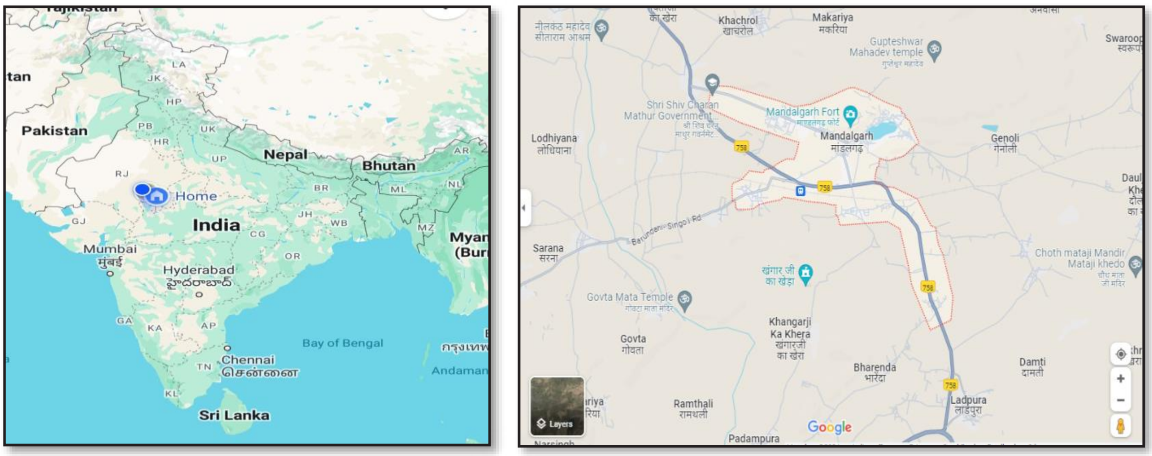
From July 2023 to January 2024, a vulture survey was conducted in Rajasthan's Bhilwara district, encompassing the Aravali highlands and Uparmal plateaus. The research area included many protected areas - Bharkiya Mata Forest, Menal Forest and Kaikria Forest region. The location of Mandalgarh Fort Bhilwara is in the southeast of Rajasthan, with latitude 25.646251 and longitude 74.636383. The Aravalli highlands are home to the Mandalgarh Fort. The Mandalgarh fort is situated on hills about 160 meters high, spanning 100 Ha, above the plains of the valley that the Banas River's Triveni Sangam drains. The vertical fortifications provide vulture nesting and roosting habitat. LBV breed in colonies and typically build their nests on rock cliffs or ancient buildings, whereas EV are primarily found in tree vulture areas.

Materials And Methods

While conducting the study of the number of active nests of EV and LBV between July 2023 to January 2024. Vulture observations were made with a Nikon 8X40 binocular, Nikon Coolpix P900, Canon D-60, and 150-600 Sigma lens. The roosting and nesting sites, breeding colonies, fecal dropping at the nesting locations, and indirect indicators of the vultures' presence—such as white guano on steep cliffs and molted feathers surrounding breeding colonies were studied.

Results

Four vulture species were recorded in the study area, with nests of two species. Nests of *Gypus fulvus*, *Neophron percnopterus,* or *Gypus bengalensis* were not recorded at Mandalgarh Fort, whereas *Gypus indicus* was observed to have the greatest number of nests (7), on a cliff. *Gypus indicus* typically builds its nests on the rocky cliffs and slopes of the Aravalli hills, while *Neophron percnopterus* built its nests on both the mobile tower on the fort and the rock cliffs. There were three *Neophron percnopterus* nests on trees in the immediate vicinity. The highest number of individuals from the *Neophron percnopterus* species (8) was noted, with *Gypus indicus* (27), *Gypus himalaynesis* (8) and *Gypus bengalensis* (5) having the lowest number of individuals. There were around 27 white fecal drooping on this cliff, which may be an indirect indication of vulture presence (Rondeau et al., 2006). Three of the species were resident- *Neophron Percnopterus,Gypus Indicus,Gypus Bengalenesis* and the other one was migratory during the winter *Gypus himalaynesis.* The IUCN (2018) status of the species, listing two as critically endangered *Gypus Indicus,Gypus*



Map 1. Vultures' region of Mandalgarh fort area of South Western part of Rajasthan (Source- Google map)

Table1: A summary of observations about vulture species during the study

Number of vulture species in study area	Migratory and resident species	Number of nests of each species	Population of each species	Vulture status	Other species
4	1 Migratory and 3 Resident species	*Neophron Percnopterus* 3 *Gypus indicus* 7	*Neophron Percnopterus 8 Gypus pndicus 27 Gypus bengalenesis 5 Gypus himalaynesis*	Migratory and resident	*Pavo cristatus Milvus migrans, Elanus caeruleus, Passer domestics, Euodice malabarica,*
			8		*Acridotheres tristis, Turdoides caudate, Pycnonotus cafer, Saxicoloides fulicatus*

Bengalenesis, one as endangered *Gypus Himalaynesis*, one as near threatened *Neophron Percnopterus*.

To safeguard egg and young against predators, a single adult vulture of either gender was constantly present in the nest following egg-laying. The adult birds flew from their nest in quest of food and drink. The timing of a feeding the chicks varied from day to day and is probably influenced by the food supply.

Few other bird species were observed in the surrounding habitat, including the Indian peafowl (*Pavo cristatus*), the Black kite (*Milvus migrans*), the Black-winged kite (*Elanus caeruleus*), the house sparrow (*Passer domestics*), the Indian silverbill (*Euodice malabarica),* the common myna (*Acridotheres tristis*), the common babbler (*Turdoides caudate*), the red-vented bulbul (*Pycnonotus cafer*), the Indian robbin (*Saxicoloides fulicatus*), and the Indian grey francolin (*Francolinus pondicerianus*) in the study area. When building a nest, incubating, and providing protection, birds of both sexes help.

Disscussion

Our research indicates that certain factors, such as the presence of cliffs in the old fort location, provided microhabitat for successful vulture nesting. Number of nests of each species were 3 for *Neophron percnopterus* and 7 for *Gypus indicus*.

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Table 2:Table showing IUCN status, number of nests and population of vulture species with abundance in the study area.

Sr.No.	Common name	Zoological Name	IUCN status	Number of nests observed	Number of adult and individuals recorded	Sighting
1	Egyptian vulture	*Neophron percnopterus*	Endangered	3	8	Common
2	Long billed vulture	*Gypus indicus*	Critically endangered	7	27	Common
3	Long backed vulture	*Gypus bengalenesis*	Critically endangered	0	5	Very rare
4	Himalayan Griffon	*Gypus himalaynesis*	Near threatened	0	8	Very rare

Figure 1. ***Gypus bengalensis***

Figure 2. ***Neophron percnopterus***

Figure 3, 4. Nest of *Gypus indicus* with juvenile

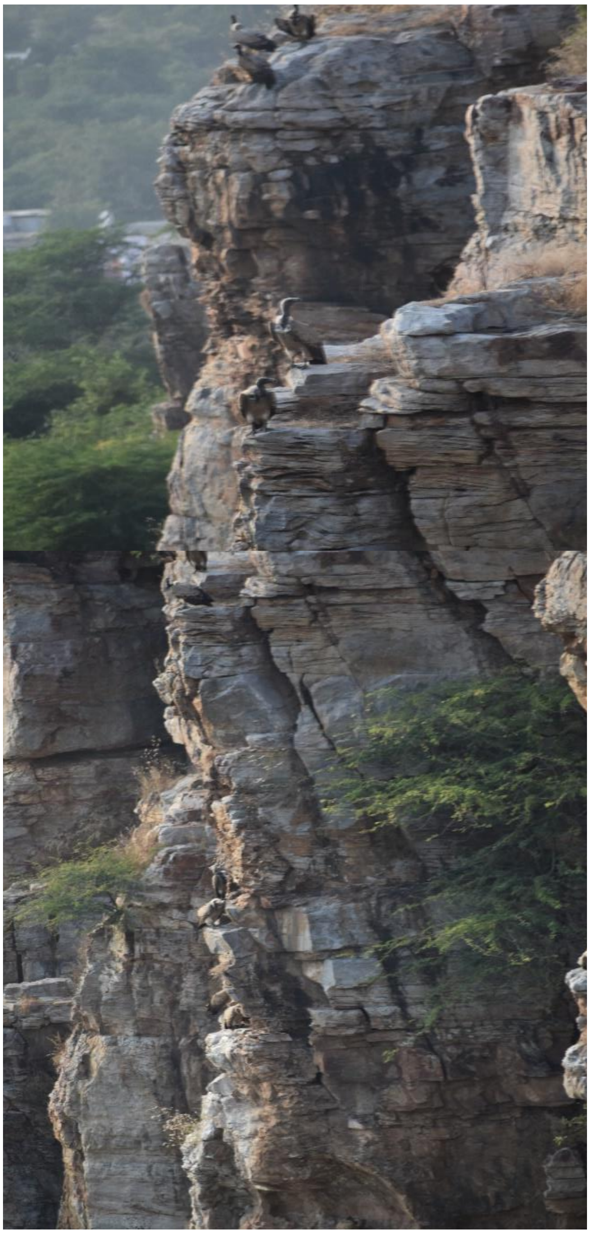

Figure 5, 6. Population of Vultures of Mandalgarh Fort

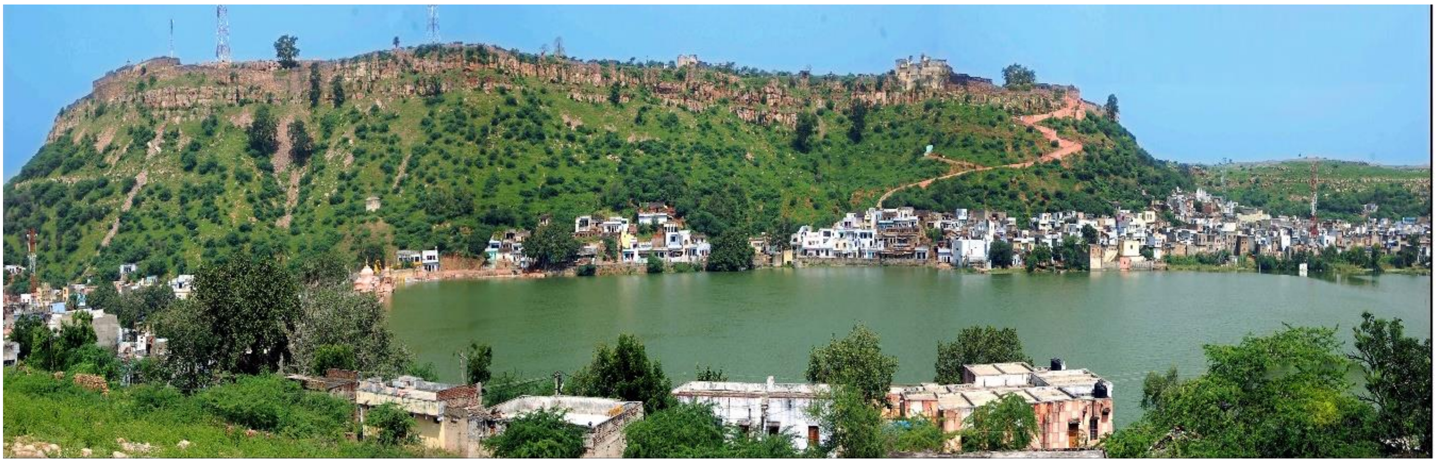

Figure 7. Mandalgarh Fort Bhilwara (Rajasthan)

Biomonitoring of heavy metals in the feathers of selected bird species from the wetland of Ayanchery, Kozhikode, Kerala

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Citation: Jobin M J, Zubair M, Surya Lysamma, Krishna Aswathi. (2024). Biomonitoring of heavy metals in the feathers of selected bird species from the wetland of Ayanchery, Kozhikode, Kerala. *Ela Journal of Forestry and Wildlife*. 13(3): 1619-1625

Date of Publication: 30 September 2024

ISSN 2319-4361

ABSTRACT

Wetlands are dynamic ecosystems that offer nesting and feeding opportunities to a variety of bird species. Wetland bird species richness, variety, and density may be influenced by the condition of the wetland. One of the biggest risks to the ecosystems of wetland areas is the pollution of toxic metals. As a non-invasive technique, feathers are an important indicator of heavy metal contamination in avian groups. We examined the levels of Arsenic (As), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Lead (Pb), Nickel (Ni), Zinc (Zn), Manganese (Mn) and Iron (Fe) using ICPMS and standards of digestion procedure from the primary feathers of 6 species of wetland birds namely, Great Egret (*Area alba*), Little Egret (*Egretta garzetta*), Cattle Egret (*Bubulcus ibis*), Asian Openbill (*Anastomus oscitans*), Glossy Ibis (*Plegadis falcinella*), Rock Pigeon (*Columba livia*). The study was conducted at a wetland area in Ayanchery, Kozhikode. All the 6 species of birds examined had the highest concentrations of Pb, Fe and Mn respectively. The level of metals in wetland birds were Pb > Fe > Mn > Zn > Cr > Ni > Cu> Cd > Co > As. Thus, the study emphasizes that managing wetlands and controlling pollution are crucial to saving wetland birds.

Key words: Heavy metals; Biomonitoring; Ayanchery; Wetland birds; Bird feathers.

INTRODUCTION

Heavy metal contamination is a major concern on a local, regional, and global scale and can affect an ecosystem's structural and functional integrity (A. Qadir et al 2008). In addition to degrading the water quality in wetlands, which directly or indirectly affects hydrophytes and animals, heavy metal pollution causes morbidity and mortality in bird species thereby reducing the richness of wetlands. Wetland dwelling organisms are susceptible to both deadly and sub-lethal impacts through bioaccumulation of organic and some inorganic pollutants over time (Gochfeld 1997).

Metals are elements of the environment that are found naturally and vary in concentration depending on the location. Certain metals, like lead, arsenic, and mercury, have no known biological functions, while others, like copper, zinc, and selenium, are toxic at higher concentrations but necessary at low ones for the maintenance of the health of people, animals, plants, and microorganisms (Fairbrother et al 2007; Ahmad et al 2010). Heavy metals are ubiquitous, highly persistent, and nonbiodegradable with long biological half-lives and they can accumulate in soils at environmentally hazardous levels (Manjula et al 2015; Yang et al 2022). The effects of pollutants on living organisms and humans have led to the emergence and use of many biomonitoring methods. In order to assess the ecosystem health status via biomonitoring. Therefore, it is necessary to select an appropriate indicator species that as representative of the other species in the ecosystem (Johnson et al 2019). The presence of contaminants in the aquatic ecosystems has negative effects on their quality and performance, such as fishing, ecotourism and recreation (Granek et al 2010).

Because they are prolific, have a large geographic distribution range, feed at multiple trophic levels, and many have long lifespans, birds are the ideal bioindicator of metal contamination because they are sensitive to both direct and indirect environmental influences (Burger and Gochfeld 2000; Kertesz and Fancsi 2003). The metal concentration in bird feathers reflects the metal content in the food and the ambient environment. Birds are exposed to environmental pollutants via oral exposure, inhalation, dermal contact, and maternal transfer (Smith et al 2007). Chronic exposure of birds to heavy metals at high levels lead to mortality or other acute effects such as increased reproductive dysfunction, increased susceptibility to disease or other stresses (Jayakumar and Muralidharan 2011). Also, heavy metal levels in the bird feather were also reported to be representative of long-term exposure to local contaminants (Kim and Koo 2007). Hence, the aim of the present study is to analyse the presence of heavy metals procured from the wetland bird feathers of the selected wetland area in Ayanchery, Kozhikode.

MATERIALS AND METHODS

Study area

The study was conducted in Ayanchery wetland that situated in the Ayanchery village of Kozhikode district, Kerala. The study site is about 1.84 KM apart from Ayanchery town. It covers an area of about 25 acres. This study mainly focuses on birds in Poluthuruthi, a small island uninhabited by people. A small temple named 'Poluthuruthi Sree Bhagavathi Temple' is located there. There is also a ditch adjacent to this wetland with a year-round water supply, which was renovated by the district panchayat in connection with the Rice Cultivation Development Project. In continuation with this wetland, Aavalapaandi and other kole lands (Kole land refers to a unique agricultural system found in the state of Kerala, India. These lands are low-lying wetlands that are seasonally flooded and used for paddy cultivation during the dry season of Velam panchayath are also found).

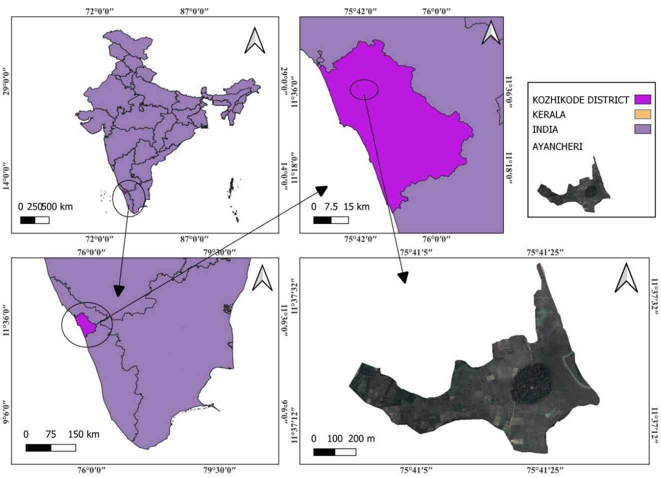

Figure 1. Map showing the wetland of Ayanchery

The birds in the wetland area were watched throughout the day using binoculars. The bird's feeding and foraging sites were identified and regularly monitored. Once the birds had moved from the area, we visited the sites and collected the freshly molten feathers of the birds for each species. Molten feathers of birds were collected from December 2023 to April 2024 in the selected site. Out of all the feathers collected from the study area, only the tail and wing feathers were used for the study. It is to be noted that only molten feathers of the birds were collected without interacting with the birds or causing any harm to them. The collected feathers were

Table 1. Table showing the concentration of heavy metals (ppm) found in six different species of wetland birds. (Mean value of the concentration of heavy metals in ppm)

Bird species	Pb	Fe	Mn	Zn	As	Cd	Co	Cr	Cu	Ni
GE	1.388	0.541	0.319	0.07	0.0002	0.003	0.004	0.144	0.15	0.066
LE	0.408	0.287	0.186	0.115	0.0002	0.04	0.003	0.112	0.08	0.065
CE	0.351	0.701	0.349	0.102	0.0005	0.022	0.003	0.116	0.062	0.065
AO	0.225	0.756	0.346	0.089	0.0002	0.017	0.004	0.117	0.047	0.058
GI	0.457	0.356	0.317	0.078	0.0002	0.041	0.003	0.092	0.039	0.052
RP	0.324	0.207	0.197	0.129	0.0002	0.02	0.002	0.107	0.055	0.057

carefully sealed in sterile zip-lock bags and transported to the laboratory. The collected feathers belonged to the following 6 species: Great Egret (*Ardea alba*), Little Egret (*Egretta garzetta*), Cattle Egret (*Bubulcus ibis*), Asian Openbill (*Anastomus oscitans*), Glossy Ibis (*Plegadis falcinella*), Rock Pigeon (*Columba livia*).

The handbook on Indian wetland birds and their protection by Kumar et al. (2005) was used to identify the bird species on the basis of feathers collected. Tail Feathers are more symmetrical, with a broader shape and the wing feathers are asymmetrical, especially the primary feathers, which have a pointed shape (Swinton and Marshall, 1960). The researchers were keenly observing both the species of egrets for few hours and they collected freshly shed feathers from the field after visual confirmation.

Feather sample processing

In the laboratory, feathers were cleaned with acetone and rinsed three times with deionised water to remove any remaining impurities, such as dust and other particles. This was followed by a 48-hour oven drying process at 60 °C. Each species' feathers were then divided into tiny fragments. Next, 1g of feathers from each species were removed and placed in beakers with labels so that the acid could break them down. The samples were mixed with a reagent that included 5 ml of nitric acid (69%) and 5 ml of hydrogen peroxide (30%) in the same proportion. The beaker was then placed on a heated plate at 70 °C until the acid digestion process finished. Final extract was cooled to room temperature, filtered using Whatman filter paper (grade 42; diameter 90 mm), and made up to 25-ml portions by adding deionized water (Gruz et al 2018). Following the above-mentioned procedure, the blank samples were also prepared without adding any samples (Arumugam et al 2018). Samples were used (in triplicate) to ascertain the results for each metal. An ICP-MS was used for the analyses. The values are presented as a ±SE (ppm) mean.

RESULTS AND DISCUSSION

All the ten metals were detected in the six wetland bird species. The metal concentrations observed in the bird feathers are presented as mean ± SD and tabulated in Table 1. Metals were assessed from the primary feathers, that are longest feathers found on the outer part and the tips of the wings of 6 distinct species of wetland birds from wetland area. Lead (Pb) was higher in Great Egret (± 1.388ppm), Little Egret (±0.408ppm), Glossy Ibis (±0.457ppm) and in Rock Pigeon (±0.324ppm) than the other metals examined. The Iron (Fe) concentration was high in Cattle Egret (± 0.701ppm) and in Asian Openbill (±0.756ppm). Other than Iron (Fe) and Lead (Pb), Manganese (Mn) were also found at higher levels in all the species compared to the other metals studied. The metals, viz., As, Cd, Co, Cr, Cu, Ni, and Zn showed differences among the various species of birds examined in the wetland. The concentrations of the ten different metals in the primary feathers of the 6 distinct species of wetland birds were Pb > Fe > Mn > Zn > Cr > Ni > Cu> Cd > Co > As.

GE - Great Egret, LE - Little Egret, CE - Cattle Egret, AO - Asian Openbill, GI - Glossy Ibis, RP - Rock Pigeon

The presence of metal pollutants in aquatic environments has been found to have a negative impact on wetland bird communities, resulting in reduced abundance, distribution, diversity, and species richness. This is due to the effects of the pollutants on the reproductive physiology and behaviour of these

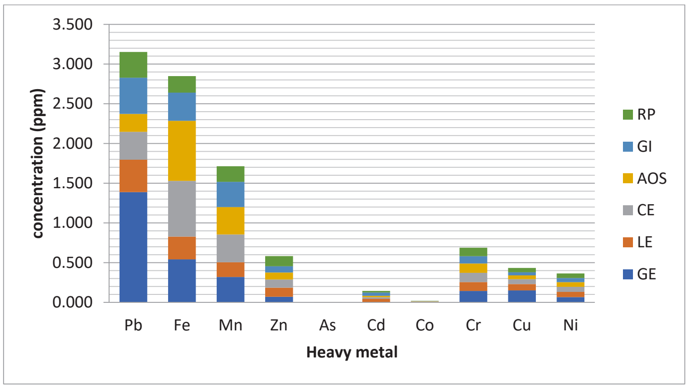

Figure 2. Graph showing the concentration of heavy metals found in six different species of wetland birds.

avian species. Numerous studies have indicated that the presence of diverse pollutants, particularly metals, can have an impact on the well-being and longevity of wetland bird populations in terms of their fitness and sustainability (Burger and Gochfeld 2004). The current study examined the metals that are directly associated with trophic structures (Bostan et al 2007). The study revealed critical results on the concentration of metals in wetland birds examined. Lead, iron and manganese were detected to be at higher levels among the ten metals in all the 6 bird species examined. Pb levels were higher in all the bird species showing that they forage on various prey species in the aquatic habitat, such as fishes, molluscs, crustaceans, insects, and other mud-dwelling organisms. The birds that feed on those prey species might have accumulated more of Cu and Pb (Kim and Koo 2007). Edwards et al (2001) reported that top predators in an aquatic ecosystem, including heronries, showed maximum Cu and Pb because bird species feed on fishes, amphibians, crustaceans, and molluscs. Indeed, the high amount of Cu and Pb in avian communities has been linked to several health problems and tissue abnormalities (Kertesz et al 2006; Burger et al 2015) and problems with reproductive behaviour, thermoregulation, movement, poor growth and survival of nestlings, and kin recognition have been reported in birds with Pb poisoning (Kertesz et al 2006). The avian body needs iron to make haemoglobin, which transports oxygen throughout the body. However, it is critical to have a balance. Too little iron in the diet can cause anaemia, while too much can cause iron storage disease, with the iron being stored first in the liver, then the lungs, heart, and other major organs. This can be fatal to the bird if the organs are damaged (PetMD 2008). In this study, slightly higher levels of iron were seen in the feathers of the bird examined and it was observed that the bird species that feed mainly in the marsh areas have the highest concentration levels of iron. After lead and iron, manganese content was detected highest in the present study. Manganese is known to be a common element in aquatic ecosystems, occurring in large quantities (Burada et al 2015). At higher concentrations, in the presence of oxygen, it precipitates and is deposited in sediments (Allen 1989), from where it is assimilated in large quantities by aquatic organisms. The highest mortality has been reported in terrestrial and wetland birds due to Zn poisoning; ducks and a few species of Columbiformes showed severe physiological effects with a higher level of Zn concentration (Vanderzee et al 1985; Mado-Filho et al 2008). In this study, Zn is present at an appropriate level ensuring its vitality in animals. The concentration level of As was the lowest in all the birds examined. Above 1.8 ppm of Cr has shown adverse effects in birds, but the present study did not observe harmful levels of Cr (Kertesz et al 2003; Kertesz et al 2006; Norouzi et al 2012). Compared to other studies worldwide, the level of Ni in the birds studied was lower (Tsipoura et al 2011; Nazneen et al 2022).

Studies have reported that Ni could affect the pigmentation in feathers and moulting mechanisms when the Ni concentration is exceeded in birds (Furness 1996; Kim and Koo 2007; Pandiyan et al 2020). However, research (Karpagavalli et al 2012), has found higher concentrations of As, Co, Cr, and Ni in the water stressing that the contamination was largely due to the dumping of solid and liquid wastes from the residential areas around the water body. In contrast to the above result, our study revealed low levels of As, Co, Cr and Ni that indicates low level of wetland water contamination. Indeed, the uptake of toxic metals in wetland birds may occur through their feeding behaviour, which involves water, soil, and prey species. A study reported that metals enter the wetland bodies through water and soil and they ingested by birds while they are feeding there (Morel and Kraepiel 1998). The accumulation of metals in the wetland birds could also occur through their prey species (Dange and Manoj 2015; Abdullah et al 2015). Studies also state that heavy metals influence 19% of the physiological activities of bird communities, along with other pollutants, such as pesticides, oil, noise, light, plastic, air, and pharmaceutical and radioactive pollution (Tartu et al 2013; Garcıa-Fernandez 2014; Ceballos et al 2017). Toxic metals threaten the wetlands habitats and various species of fauna and flora, depending on the wetlands (Sun et al 2023).

CONCLUSION

The results of this study demonstrated the differences in metal buildup in wetland birds, which could be caused by the dietary and hunting habits of various species. Lead was at higher levels in the species of Great Egret (1.388ppm), Little Egret (0.408ppm, Glossy Ibis (0.457ppm) and Rock pigeon (0.324ppm), while Iron was found highest in the species of Cattle Egret (0.701ppm) and Asian Openbill (0.756ppm). Feathers are becoming more and more common in studies on heavy metal contamination, and this should be viewed as a first indication of the potentially dangerous effects of the heavy metals in wetland birds. The species of egrets showed the highest range of Iron (0.287-0.701ppm), Lead (0.351-1.388ppm), and Manganese (0.186-0.349ppm) contamination. The amount of Arsenic was the least in all the bird species ranging from 0.0002-0.0005ppm. Furthermore, a number of sources of pollution in the research area's aquatic habitats may have an impact on the metal burden in the wetland birds under investigation. The study issues a warning, stating that we must monitor and maintain the wetlands as pollution-free habitats because the metals have a negative impact on human and animal health.

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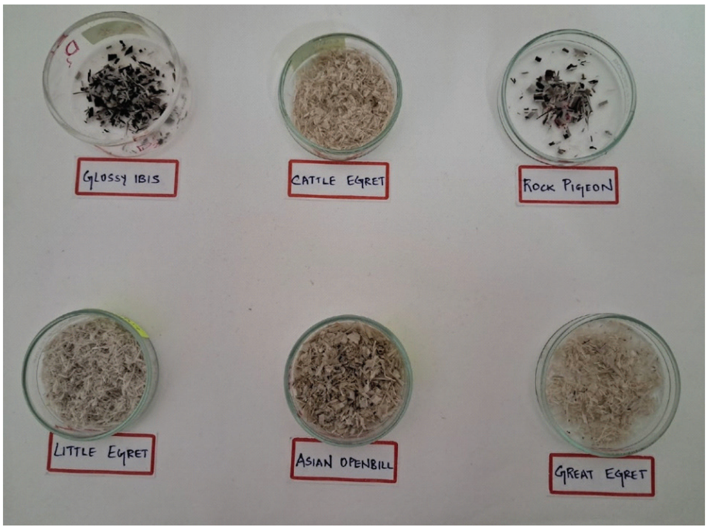

Figure showing the feather processing of the selected bird species.

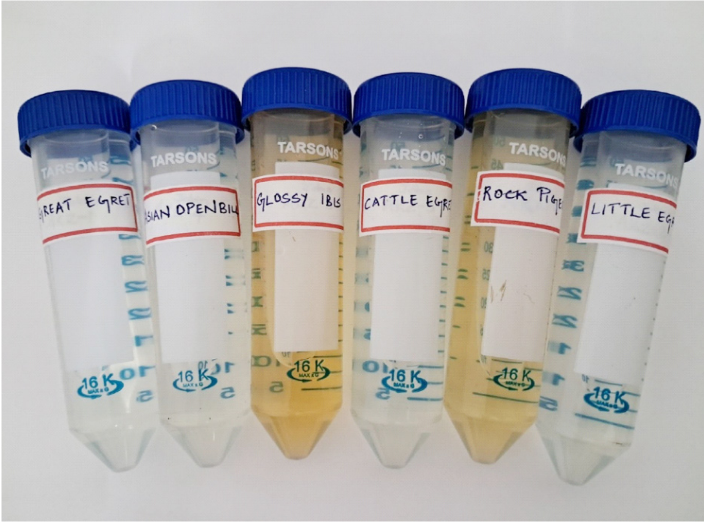

Figure showing the samples used for the ICP-MS metal analysis.

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Record of predation of the chick of Short-toed Snake Eagle *Cercaetus gallicus* by Bonelli's Eagle *Aquila fasciata* in Kolvihire, District Pune, Maharashtra

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Citation: Pande Satish, Sumant Omkar, Bhujbal Avishkar, Sawant Manthan, Khaire Aryan, Pawar Rajkumar and Bhujbal Sahil. (2024). Record of predation of the chick of Short-toed Snake Eagle *Cercaetus gallicus* by Bonelli's Eagle *Aquila fasciata* in Kolvihire, District Pune, Maharashtra. *Ela Journal of Forestry and Wildlife*. 13(3): 1626-1627

Date of Publication: 30 September 2024

ISSN 2319-4361

- **Name of Species:** Short-toed Snake Eagle and Bonelli's Eagle
- **Scientific Name:** *Cercaetus gallicus* and *Aquila fasciata*
- **Status:** Least concern, IUCN 2012
- **Date of sighting:** 15th May 2024
- **Time of sighting:** 0554pm
- **Weather:** Sunny
- **Number of times sighted:** Once
- **Number of birds:** Three
- **Gender of birds:** Unknown
- **Locality:** Pawarwadi, Kolvihire, Tal- Purandar, Dist-Pune
- **Habitat Discription:** Scrubland and Agriculture
- **Distance from human habitation:** 2km
- **Any other bird/ animal associate:** *Corvus culminates* Jungle Crows sometimes mobbed the chick.
- **Bird behaviour:** A nest of Short-toed Snake Eagle was found on *Accacia* tree. The nest was located on 12 ft from ground level. During nest observation, on 15th May 2024 at 5.57pm a one-month-old chick was perching in the nest and was wing flapping, when an adult Bonelli's Eagle attacked the chick and carried the chick in its talon, which could be recorded on camera. We found the half-eaten carcass of the chick at 50m away from the nest on ground and a fully grown snake was exposed in the half eaten stomach of the predated Short-toed Snake Eagle chick.
- **Threats to Habitat:** Habitat modification, chopping the trees for fodder and other uses.
- **Photographs:** Attached
- **Previous Records:** No documented record of Short-toed Snake Eagle's chick predation by Bonelli's Eagle from the region or from any other locality could be found. This appears to be the first such record of a raptor chick being predated and eaten by another raptor.

Checklist of Birds of Dhule, Maharashtra

*** Umakant Arun Patil, Pradeep M. Vyawahare, Amol Bharat Khairnar, Kunal Manohar Patil, Himanshu Padmaja Pradeep Tembhekar, Raj Kiran Patil, Tushar Yashwantrao More**

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Citation: Patil Umakant Arun, Vyawahare Pradeep M., Khairnar Amol Bharat, Patil Kunal Manohar, Tembhekar Himanshu Padmaja Pradeep, Patil Raj Kiran, More Tushar Yashwantrao. (2024). Checklist of Birds of Dhule, Maharashtra. *Ela Journal of Forestry and Wildlife*. 13(3): 1628-1640

Date of Publication: 30 September 2024

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INTRODUCTION

The checklist of birds of Dhule, Maharashtra was prepared by the authors though random field observation over the past decade. Various habitats were visited in all the three seasons. There are 76 bird families, and 210 genera of 350 avian species. The IUCN Red-List status of these birds is as follows: 2 species are Critically Endangered, 3 are Endangered, 11 Near Threatened, 3 Vulnerable and 331 Least Concern.

Only those species where photographic documentation could be done are included. Birds are dynamic creatures and we understand that the present checklist is not complete and is likely to change as more birdwatchers start going in the field and take good photographs.

Various habitats are facing threats from habitat modification and destruction, hunting, trapping and introduction of exotic species of flora and fauna.

To the best of our knowledge this is the first comprehensive chesklist of birds of Dhule.

Sr. NO.	BIRDS OF DHULE DISTRICT			
	Family	**Birds**	**Scientific Name**	**New Name (If Any)**
1	Ducks, Geese and Swans	Lesser Whistling Duck	*Dendrocygna javanica*	No
2	Ducks, Geese and Swans	Bar-headed Goose	*Anser indicus*	No
3	Ducks, Geese and Swans	Greylag Goose	*Anser anser*	No
4	Ducks, Geese and Swans	Knob-billed Duck	*Sarkidiornis melanotos*	No
5	Ducks, Geese and Swans	Common Shelduck	*Tadorna tadorna*	No
6	Ducks, Geese and Swans	Ruddy Shelduck	*Tadorna ferruginea*	No
7	Ducks, Geese and Swans	Cotton Pygmy Goose	*Nettapus coromandelianus*	No
8	Ducks, Geese and Swans	Garganey	*Spatula querquedula*	No
9	Ducks, Geese and Swans	Northern Shoveler	*Spatula clypeata*	No
10	Ducks, Geese and Swans	Gadwall	*Mareca strepera*	No
11	Ducks, Geese and Swans	Eurasian Wigeon	*Mareca penelope*	No
12	Ducks, Geese and Swans	Indian Spot-billed Duck	*Anas poecilorhyncha*	No
13	Ducks, Geese and Swans	Mallard	*Anas platyrhynchos*	No
14	Ducks, Geese and Swans	Northern Pintail	*Anas acuta*	No
15	Ducks, Geese and Swans	Red-crested Pochard	*Netta rufina*	No
16	Ducks, Geese and Swans	Common Pochard	*Aythya ferina*	No
17	Ducks, Geese and Swans	Ferruginous Duck	*Aythya nyroca*	No
18	Ducks, Geese and Swans	Tufted Duck	*Aythya fuligula*	No
19	Pheasants and allies	Indian Peafowl	*Pavo cristatus*	No
20	Pheasants and allies	Grey Francolin	*Ortygornis pondicerianus*	No
21	Pheasants and allies	Painted Francolin	*Francolinus pictus*	No
22	Pheasants and allies	Common Quail	*Coturnix coturnix*	No
23	Pheasants and allies	Rain Quail	*Coturnix coromandelica*	No
24	Pheasants and allies	Jungle Bush Quail	*Perdicula asiatica*	No
25	Pheasants and allies	Rock Bush Quail	*Perdicula argoondah*	No
26	Nightjars	Jungle Nightjar	*Caprimulgus indicus*	No
27	Nightjars	Indian Nightjar	*Caprimulgus asiaticus*	No
28	Nightjars	Savanna Nightjar	*Caprimulgus affinis*	No
29	Treeswifts	Crested Treeswift	*Hemiprocne coronata*	No
30	Swifts	Asian Palm Swift	*Cypsiurus balasiensis*	No
31	Swifts	Alpine Swift	*Tachymarptis melba*	No
32	Swifts	Little Swift	*Apus affinis*	No
33	Bustards	Lesser Florican	*Sypheotides indicus*	No

34	Cuckoos	Southern Coucal	*Centropus (sinensis) parroti*	No
35	Cuckoos	Sirkeer Malkoha	*Taccocua leschenaultii*	No
36	Cuckoos	Jacobin Cuckoo	*Clamator jacobinus*	No
37	Cuckoos	Asian Koel	*Eudynamys scolopaceus*	No
38	Cuckoos	Grey-bellied Cuckoo	*Cacomantis passerinus*	No
39	Cuckoos	Square-tailed Drongo-Cuckoo	*Surniculus lugubris*	No
40	Cuckoos	Common Hawk-Cuckoo	*Hierococcyx varius*	No
41	Cuckoos	Indian Cuckoo	*Cuculus micropterus*	No
42	Cuckoos	Common Cuckoo	*Cuculus canorus*	No
43	Sandgrouse	Chestnut-bellied Sandgrouse	*Pterocles exustus*	No
44	Sandgrouse	Painted Sandgrouse	*Pterocles indicus*	No
45	Pigeons, Doves	Rock Dove	*Columba livia*	No
46	Pigeons, Doves	Oriental Turtle Dove	*Streptopelia orientalis*	No
47	Pigeons, Doves	Eurasian Collared Dove	*Streptopelia decaocto*	No
48	Pigeons, Doves	Red Collared Dove	*Streptopelia tranquebarica*	No
49	Pigeons, Doves	Spotted Dove	*Spilopelia chinensis*	No
50	Pigeons, Doves	Laughing Dove	*Spilopelia senegalensis*	No
51	Pigeons, Doves	Yellow-footed Green Pigeon	*Treron phoenicopterus*	No
52	Rails, Crakes and Coots	Common Moorhen	*Gallinula chloropus*	No
53	Rails, Crakes and Coots	Eurasian Coot	*Fulica atra*	No
54	Rails, Crakes and Coots	Grey-headed Swamphen	*Porphyrio poliocephalus*	No
55	Rails, Crakes and Coots	Brown Crake	*Zapornia akool*	No
56	Rails, Crakes and Coots	Baillon's Crake	*Zapornia pusilla*	No
57	Rails, Crakes and Coots	White-breasted Waterhen	*Amaurornis phoenicurus*	No
58	Cranes	Demoiselle Crane	*Grus virgo*	No
59	Cranes	Common Crane	*Grus grus*	No
60	Grebes	Little Grebe	*Tachybaptus ruficollis*	No
61	Flamingos	Greater Flamingo	*Phoenicopterus roseus*	No
62	Buttonquail	Common Buttonquail	*Turnix sylvaticus*	Small Buttonquail
63	Buttonquail	Yellow-legged Buttonquail	*Turnix tanki*	No

64	Buttonquail	Barred Buttonquail	*Turnix suscitator*	No
65	Stone-curlews, Thick-knees	Indian Stone-Curlew	*Burhinus indicus*	Indian Thick-Knee
66	Stone-curlews, Thick-knees	Great Stone-Curlew	*Esacus recurvirostris*	Great Thick-Knee
67	Stilts, Avocets	Black-winged Stilt	*Himantopus himantopus*	No
68	Stilts, Avocets	Pied Avocet	*Recurvirostra avosetta*	No
69	Plovers	Grey-headed Lapwing	*Vanellus cinereus*	No
70	Plovers	Red-wattled Lapwing	*Vanellus indicus*	No
71	Plovers	White-tailed Lapwing	*Vanellus leucurus*	No
72	Plovers	Pacific Golden Plover	*Pluvialis fulva*	No
73	Plovers	Grey Plover	*Pluvialis squatarola*	No
74	Plovers	Little Ringed Plover	*Charadrius dubius*	No
75	Plovers	Kentish Plover	*Charadrius alexandrinus*	No
76	Painted-snipes	Greater Painted-snipe	*Rostratula benghalensis*	No
77	Jacanas	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	No
78	Jacanas	Bronze-winged Jacana	*Metopidius indicus*	No
79	Sandpipers, Snipes	Eurasian Whimbrel	*Numenius phaeopus*	No
80	Sandpipers, Snipes	Eurasian Curlew	*Numenius arquata*	No
81	Sandpipers, Snipes	Black-tailed Godwit	*Limosa limosa*	No
82	Sandpipers, Snipes	Ruddy Turnstone	*Arenaria interpres*	No
83	Sandpipers, Snipes	Ruff	*Calidris pugnax*	No
84	Sandpipers, Snipes	Curlew Sandpiper	*Calidris ferruginea*	No
85	Sandpipers, Snipes	Temminck's Stint	*Calidris temminckii*	No
86	Sandpipers, Snipes	Sanderling	*Calidris alba*	No
87	Sandpipers, Snipes	Dunlin	*Calidris alpina*	No
88	Sandpipers, Snipes	Little Stint	*Calidris minuta*	No
89	Sandpipers, Snipes	Jack Snipe	*Lymnocryptes minimus*	No
90	Sandpipers, Snipes	Wood Snipe	*Gallinago nemoricola*	No
91	Sandpipers, Snipes	Pin-tailed Snipe	*Gallinago stenura*	No
92	Sandpipers, Snipes	Common Snipe	*Gallinago gallinago*	No

93	Sandpipers, Snipes	Terek Sandpiper	*Xenus cinereus*	No
94	Sandpipers, Snipes	Common Sandpiper	*Actitis hypoleucos*	No
95	Sandpipers, Snipes	Green Sandpiper	*Tringa ochropus*	No
96	Sandpipers, Snipes	Common Redshank	*Tringa totanus*	No
97	Sandpipers, Snipes	Marsh Sandpiper	*Tringa stagnatilis*	No
98	Sandpipers, Snipes	Wood Sandpiper	*Tringa glareola*	No
99	Sandpipers, Snipes	Spotted Redshank	*Tringa erythropus*	No
100	Sandpipers, Snipes	Common Greenshank	*Tringa nebularia*	No
101	Coursers, Pratincoles	Indian Courser	*Cursorius coromandelicus*	No
102	Coursers, Pratincoles	Collared Pratincole	*Glareola pratincola*	No
103	Coursers, Pratincoles	Oriental Pratincole	*Glareola maldivarum*	No
104	Coursers, Pratincoles	Small Pratincole	*Glareola lactea*	No
105	Gulls, Terns and Skimmers	Indian Skimmer	*Rynchops albicollis*	No
106	Gulls, Terns and Skimmers	Brown-headed Gull	*Chroicocephalus brunnicephalus*	No
107	Gulls, Terns and Skimmers	Black-headed Gull	*Chroicocephalus ridibundus*	No
108	Gulls, Terns and Skimmers	White Tern	*Gygis alba*	No
109	Gulls, Terns and Skimmers	Pallas's Gull	*Ichthyaetus ichthyaetus*	No
110	Gulls, Terns and Skimmers	Gull-billed Tern	*Gelochelidon nilotica*	No
111	Gulls, Terns and Skimmers	Caspian Tern	*Hydroprogne caspia*	No
112	Gulls, Terns and Skimmers	Little Tern	*Sternula albifrons*	No
113	Gulls, Terns and Skimmers	River Tern	*Sterna aurantia*	No
114	Gulls, Terns and Skimmers	Black-bellied Tern	*Sterna acuticauda*	No
115	Gulls, Terns and Skimmers	Whiskered Tern	*Chlidonias hybrida*	No
116	Storks	Painted Stork	*Mycteria leucocephala*	No
117	Storks	Asian Openbill	*Anastomus oscitans*	No
118	Storks	Black Stork	*Ciconia nigra*	No
119	Storks	Asian Woolly-necked Stork	*Ciconia episcopus*	No
120	Storks	White Stork	*Ciconia ciconia*	No
121	Anhingas, Darters	Oriental Darter	*Anhinga melanogaster*	No
122	Cormorants, Shags	Little Cormorant	*Microcarbo niger*	No
123	Cormorants, Shags	Indian Cormorant	*Phalacrocorax fuscicollis*	No
124	Cormorants, Shags	Great Cormorant	*Phalacrocorax carbo*	No
125	Ibises, Spoonbills	Black-headed Ibis	*Threskiornis melanocephalus*	No
126	Ibises, Spoonbills	Red-naped Ibis	*Pseudibis papillosa*	No

127	Ibises, Spoonbills	Glossy Ibis	*Plegadis falcinellus*	No
128	Ibises, Spoonbills	Eurasian Spoonbill	*Platalea leucorodia*	No
129	Herons, Bitterns	Eurasian Bittern	*Botaurus stellaris*	Great Bittern
130	Herons, Bitterns	Yellow Bittern	*Ixobrychus sinensis*	No
131	Herons, Bitterns	Cinnamon Bittern	*Ixobrychus cinnamomeus*	No
132	Herons, Bitterns	Black Bittern	*Ixobrychus flavicollis*	No
133	Herons, Bitterns	Black-crowned Night Heron	*Nycticorax nycticorax*	No
134	Herons, Bitterns	Striated Heron	*Butorides striata*	No
135	Herons, Bitterns	Indian Pond Heron	*Ardeola grayii*	No
136	Herons, Bitterns	Cattle Egret	*Bubulcus ibis*	No
137	Herons, Bitterns	Grey Heron	*Ardea cinerea*	No
138	Herons, Bitterns	Purple Heron	*Ardea purpurea*	No
139	Herons, Bitterns	Great Egret	*Ardea alba*	No
140	Herons, Bitterns	Medium Egret	*Ardea intermedia*	No
141	Herons, Bitterns	Little Egret	*Egretta garzetta*	No
142	Herons, Bitterns	Western Reef Heron	*Egretta gularis*	No
143	Ospreys	Osprey	*Pandion haliaetus*	No
144	Kites, Hawks and Eagles	Black-winged Kite	*Elanus caeruleus*	No
145	Kites, Hawks and Eagles	Egyptian Vulture	*Neophron percnopterus*	No
146	Kites, Hawks and Eagles	Crested Honey Buzzard	*Pernis ptilorhynchus*	Oriental Honey Buzzard
147	Kites, Hawks and Eagles	Indian Vulture	*Gyps indicus*	No
148	Kites, Hawks and Eagles	Crested Serpent Eagle	*Spilornis cheela*	No
149	Kites, Hawks and Eagles	Short-toed Snake Eagle	*Circaetus gallicus*	No
150	Kites, Hawks and Eagles	Black Eagle	*Ictinaetus malaiensis*	No
151	Kites, Hawks and Eagles	Changeable Hawk-Eagle	*Nisaetus cirrhatus*	Crested Hawk Eagle
152	Kites, Hawks and Eagles	Indian Spotted Eagle	*Clanga hastata*	No
153	Kites, Hawks and Eagles	Greater Spotted Eagle	*Clanga clanga*	No
154	Kites, Hawks and Eagles	Booted Eagle	*Hieraaetus pennatus*	No
155	Kites, Hawks and Eagles	Tawny Eagle	*Aquila rapax*	No
156	Kites, Hawks and Eagles	Steppe Eagle	*Aquila nipalensis*	No
157	Kites, Hawks and Eagles	Bonelli's Eagle	*Aquila fasciata*	No
158	Kites, Hawks and Eagles	Shikra	*Accipiter badius*	No
159	Kites, Hawks and Eagles	Eurasian Sparrowhawk	*Accipiter nisus*	No

160	Kites, Hawks and Eagles	Western Marsh Harrier	*Circus aeruginosus*	Eurasian Marsh Harrier
161	Kites, Hawks and Eagles	Pallid Harrier	*Circus macrourus*	No
162	Kites, Hawks and Eagles	Montagu's Harrier	*Circus pygargus*	No
163	Kites, Hawks and Eagles	Black Kite	*Milvus migrans*	No
164	Kites, Hawks and Eagles	Brahminy Kite	*Haliastur indus*	No
165	Kites, Hawks and Eagles	Black-eared Kite	*Milvus (migran) lineatus*	No
166	Kites, Hawks and Eagles	Grey-headed Fish Eagle	*Icthyophaga ichthyaetus*	No
167	Kites, Hawks and Eagles	White-eyed Buzzard	*Butastur teesa*	No
168	Kites, Hawks and Eagles	Common Buzzard	*Buteo buteo*	No
169	Barn owls	Barn Owl	*Tyto alba*	No
170	Owls	Brown Boobook	*Ninox scutulata*	Brown Hawk Owl
171	Owls	Spotted Owlet	*Athene brama*	No
172	Owls	Forest Owlet	*Athene blewitti*	No
173	Owls	Jungle Owlet	*Glaucidium radiatum*	No
174	Owls	Oriental Scops Owl	*Otus sunia*	No
175	Owls	Indian Scops Owl	*Otus bakkamoena*	No
176	Owls	Short-eared Owl	*Asio flammeus*	No
177	Owls	Indian Eagle-owl	*Bubo bengalensis*	No
178	Owls	Brown Fish Owl	*Ketupa zeylonensis*	No
179	Owls	Mottled Wood Owl	*Strix ocellata*	No
180	Owls	Brown Wood Owl	*Strix leptogrammica*	No
181	Hoopoes	Eurasian Hoopoe	*Upupa epops*	No
182	Hornbills	Indian Grey Hornbill	*Ocyceros birostris*	No
183	Rollers	Indian Roller	*Coracias benghalensis*	No
184	Rollers	European Roller	*Coracias garrulus*	No
185	Kingfishers	White-throated Kingfisher	*Halcyon smyrnensis*	No
186	Kingfishers	Common Kingfisher	*Alcedo atthis*	No
187	Kingfishers	Pied Kingfisher	*Ceryle rudis*	No
188	Bee-eaters	Asian Green Bee-eater	*Merops orientalis*	No
189	Bee-eaters	Blue-cheeked Bee-eater	*Merops persicus*	No
190	Bee-eaters	Blue-tailed Bee-eater	*Merops philippinus*	No

191	Asian Barbets	Brown-headed Barbet	*Psilopogon zeylanicus*	No
192	Asian Barbets	White-cheeked Barbet	*Psilopogon viridis*	No
193	Asian Barbets	Coppersmith Barbet	*Psilopogon haemacephalus*	No
194	Woodpeckers	Eurasian Wryneck	*Jynx torquilla*	No
195	Woodpeckers	Brown-capped Pygmy Woodpecker	*Yungipicus nanus*	No
196	Woodpeckers	Yellow-crowned Woodpecker	*Leiopicus mahrattensis*	No
197	Woodpeckers	Black-rumped Flameback	*Dinopium benghalense*	Lesser Goldenback
198	Woodpeckers	White-naped Woodpecker	*Chrysocolaptes festivus*	No
199	Caracaras, Falcons	Common Kestrel	*Falco tinnunculus*	No
200	Caracaras, Falcons	Red-necked Falcon	*Falco chicquera*	No
201	Caracaras, Falcons	Amur Falcon	*Falco amurensis*	No
202	Caracaras, Falcons	Merlin	*Falco columbarius*	No
203	Caracaras, Falcons	Eurasian Hobby	*Falco subbuteo*	No
204	Caracaras, Falcons	Laggar Falcon	*Falco jugger*	No
205	Caracaras, Falcons	Peregrine Falcon	*Falco peregrinus*	No
206	Parrots	Plum-headed Parakeet	*Psittacula cyanocephala*	No
207	Parrots	Alexandrine Parakeet	*Psittacula eupatria*	No
208	Parrots	Rose-ringed Parakeet	*Psittacula krameri*	No
209	Pittas	Indian Pitta	*Pitta brachyura*	No
210	Woodshrikes and allies	Common Woodshrike	*Tephrodornis pondicerianus*	No
211	Ioras	Common Iora	*Aegithina tiphia*	No
212	Cuckooshrikes	White-bellied Minivet	*Pericrocotus erythropygius*	No
213	Cuckooshrikes	Small Minivet	*Pericrocotus cinnamomeus*	No
214	Cuckooshrikes	Large Cuckooshrike	*Coracina macei*	No
215	Cuckooshrikes	Black-headed Cuckooshrike	*Lalage melanoptera*	No
216	Shrikes	Brown Shrike	*Lanius cristatus*	No
217	Shrikes	Isabelline Shrike	*Lanius isabellinus*	No
218	Shrikes	Red-tailed Shrike	*Lanius phoenicuroides*	No

219	Shrikes	Bay-backed Shrike	*Lanius vittatus*	No
220	Shrikes	Long-tailed Shrike	*Lanius schach*	No
221	Shrikes	Great Grey Shrike	*Lanius MERIDIONNALIS*	Southern Grey Shrike
222	Figbirds, Orioles	Black-hooded Oriole	*Oriolus xanthornus*	No
223	Figbirds, Orioles	Indian Golden Oriole	*Oriolus kundoo*	No
224	Drongos	Greater Racket-tailed Drongo	*Dicrurus paradiseus*	No
225	Drongos	Ashy Drongo	*Dicrurus leucophaeus*	No
226	Drongos	White-bellied Drongo	*Dicrurus caerulescens*	No
227	Drongos	Black Drongo	*Dicrurus macrocercus*	No
228	Fantails	White-spotted Fantail	*Rhipidura albogularis*	No
229	Fantails	White-browed Fantail	*Rhipidura aureola*	No
230	Monarchs	Black-naped Monarch	*Hypothymis azurea*	No
231	Monarchs	Indian Paradise Flycatcher	*Terpsiphone paradisi*	No
232	Crows, Jays	Rufous Treepie	*Dendrocitta vagabunda*	No
233	Crows, Jays	House Crow	*Corvus splendens*	No
234	Crows, Jays	Indian Jungle Crow	*Corvus culminatus*	No
235	Fairy Flycatchers	Grey-headed Canary-flycatcher	*Culicicapa ceylonensis*	No
236	Tits, Chickadees	Great Tit	*Parus major*	No
237	Tits, Chickadees	Indian Yellow Tit	*Parus (xanthogenys) aplonotus*	No
238	Larks	Rufous-tailed Lark	*Ammomanes phoenicura*	No
239	Larks	Ashy-crowned Sparrow-Lark	*Eremopterix griseus*	No
240	Larks	Singing Bush Lark	*Mirafra javanica*	No
241	Larks	Indian Bush Lark	*Mirafra erythroptera*	No
242	Larks	Oriental Skylark	*Alauda gulgula*	No
243	Larks	Sykes's Lark	*Galerida deva*	Tawny Lark
244	Larks	Crested Lark	*Galerida cristata*	No
245	Larks	Malabar Lark	*Galerida malabarica*	No
246	Larks	Mongolian Short-toed Lark	*Calandrella dukhunensis*	No

247	Larks	Greater Short-toed Lark	*Calandrella brachydactyla*	No
248	Larks	Bimaculated Lark	*Melanocorypha bimaculata*	No
249	Bulbuls	White-browed Bulbul	*Pycnonotus luteolus*	No
250	Bulbuls	Red-whiskered Bulbul	*Pycnonotus jocosus*	No
251	Bulbuls	Red-vented Bulbul	*Pycnonotus cafer*	No
252	Swallows, Martins	Eurasian Crag Martin	*Ptyonoprogne rupestris*	No
253	Swallows, Martins	Dusky Crag Martin	*Ptyonoprogne concolor*	No
254	Swallows, Martins	Wire-tailed Swallow	*Hirundo smithii*	No
255	Swallows, Martins	Barn Swallow	*Hirundo rustica*	No
256	Swallows, Martins	Red-rumped Swallow	*Cecropis daurica*	No
257	Swallows, Martins	Streak-throated Swallow	*Petrochelidon fluvicola*	No
258	Leaf Warblers and allies	Hume's Leaf Warbler	*Phylloscopus humei*	No
259	Leaf Warblers and allies	Tytler's Leaf Warbler	*Phylloscopus tytleri*	No
260	Leaf Warblers and allies	Sulphur-bellied Warbler	*Phylloscopus griseolus*	No
261	Leaf Warblers and allies	Common Chiffchaff	*Phylloscopus collybita*	No
262	Leaf Warblers and allies	Green Warbler	*Phylloscopus nitidus*	No
263	Leaf Warblers and allies	Greenish Warbler	*Phylloscopus trochiloides*	No
264	Reed Warblers and allies	Clamorous Reed Warbler	*Acrocephalus stentoreus*	No
265	Reed Warblers and allies	Paddyfield Warbler	*Acrocephalus agricola*	No
266	Reed Warblers and allies	Blyth's Reed Warbler	*Acrocephalus dumetorum*	No
267	Reed Warblers and allies	Booted Warbler	*Iduna caligata*	No
268	Reed Warblers and allies	Sykes's Warbler	*Iduna rama*	No
269	Cisticolas and allies	Zitting Cisticola	*Cisticola juncidis*	No
270	Cisticolas and allies	Rufous-fronted Prinia	*Prinia buchanani*	No
271	Cisticolas and allies	Grey-breasted Prinia	*Prinia hodgsonii*	No
272	Cisticolas and allies	Jungle Prinia	*Prinia sylvatica*	No

273	Cisticolas and allies	Ashy Prinia	*Prinia socialis*	No
274	Cisticolas and allies	Plain Prinia	*Prinia inornata*	No
275	Cisticolas and allies	Common Tailorbird	*Orthotomus sutorius*	No
276	Sylviid Babblers	Lesser Whitethroat	*Curruca curruca*	No
277	Sylviid Babblers	Hume's Whitethroat	*Sylvia althaea*	No
278	Sylviid Babblers	Orphean Warbler	*Sylvia hortensis*	No
279	Sylviid Babblers	Yellow-Eyed Babbler	*Chrysomma sinense*	No
280	White-eyes	Indian White-eye	*Zosterops palpebrosus*	No
281	Babblers, Scimitar Babbler	Tawny-bellied Babbler	*Dumetia hyperythra*	No
282	Babblers, Scimitar Babbler	Indian Scimitar Babbler	*Pomatorhinus horsfieldii*	No
283	Fulvettas, Ground Babblers	Puff-throated Babbler	*Pellorneum ruficeps*	No
284	Fulvettas, Ground Babblers	Brown-cheeked Fulvetta	*Alcippe poioicephala*	No
285	Laughingthrushes	Large Grey Babbler	*Argya malcolmi*	No
286	Laughingthrushes	Jungle Babbler	*Argya striata*	No
287	Laughingthrushes	Common Babbler	*Argya caudata*	No
288	Treecreepers	Indian Spotted Creeper	*Salpornis spilonota*	No
289	Starlings, Rhabdornis	Common Myna	*Acridotheres tristis*	No
290	Starlings, Rhabdornis	Indian Pied Myna	*Gracupica contra*	No
291	Starlings, Rhabdornis	Chestnut-tailed Starling	*Sturnia malabarica*	No
292	Starlings, Rhabdornis	Brahminy Starling	*Sturnia pagodarum*	No
293	Starlings, Rhabdornis	Rosy Starling	*Pastor roseus*	No
294	Starlings, Rhabdornis	Common Starling	*Sturnus vulgaris*	No
295	Thrushes	Orange-headed Thrush	*Geokichla citrina*	No
296	Chats, Old World Flycatchers	Indian Robin	*Copsychus fulicatus*	No
297	Chats, Old World Flycatchers	Oriental Magpie-Robin	*Copsychus saularis*	No
298	Chats, Old World Flycatchers	Asian Brown Flycatcher	*Muscicapa dauurica*	No
299	Chats, Old World Flycatchers	Tickell's Blue Flycatcher	*Cyornis tickelliae*	No
300	Chats, Old World Flycatchers	Verditer Flycatcher	*Eumyias thalassinus*	No
301	Chats, Old World Flycatchers	Bluethroat	*Luscinia svecica*	No

302	Chats, Old World Flycatchers	Ultramarine Flycatcher	*Ficedula superciliaris*	No
303	Chats, Old World Flycatchers	Taiga Flycatcher	*Ficedula albicilla*	No
304	Chats, Old World Flycatchers	Red-Breasted Flycatcher	*Ficedula parva*	No
305	Chats, Old World Flycatchers	Black Redstart	*Phoenicurus ochruros*	No
306	Chats, Old World Flycatchers	Blue Rock Thrush	*Monticola solitarius*	No
307	Chats, Old World Flycatchers	Blue-capped Rock Thrush	*Monticola cinclorhyncha*	No
308	Chats, Old World Flycatchers	Siberian Stonechat	*Saxicola maurus*	Common Stonechat
309	Chats, Old World Flycatchers	Pied Bush Chat	*Saxicola caprata*	No
310	Chats, Old World Flycatchers	Isabelline Wheatear	*Oenanthe isabellina*	No
311	Chats, Old World Flycatchers	Desert Wheatear	*Oenanthe deserti*	No
312	Chats, Old World Flycatchers	Brown Rock Chat	*Oenanthe fusca*	No
313	Chats, Old World Flycatchers	Variable Wheatear	*Oenanthe picata*	No
314	Leafbirds	Jerdon's Leafbird	*Chloropsis jerdoni*	No
315	Leafbirds	Golden-fronted Leafbird	*Chloropsis aurifrons*	No
316	Flowerpeckers	Thick-billed Flowerpecker	*Dicaeum agile*	No
317	Flowerpeckers	Pale-billed Flowerpecker	*Dicaeum erythrorhynchos*	No
318	Sunbirds	Purple-rumped Sunbird	*Leptocoma zeylonica*	No
319	Sunbirds	Crimson-backed Sunbird	*Leptocoma minima*	No
320	Sunbirds	Purple Sunbird	*Cinnyris asiaticus*	No
321	Sunbirds	Vigors's Sunbird	*Aethopyga vigorsii*	No
322	Old World Sparrows, Snowfinches	Yellow-throated Sparrow	*Gymnoris xanthocollis*	No
323	Old World Sparrows, Snowfinches	House Sparrow	*Passer domesticus*	No
324	Weavers, Widowbirds	Black-breasted weaver	*Ploceus benghalensis*	No
325	Weavers, Widowbirds	Baya Weaver	*Ploceus philippinus*	No
326	Waxbills, Munias and allies	Indian Silverbill	*Euodice malabarica*	No
327	Waxbills, Munias and allies	Scaly-breasted Munia	*Lonchura punctulata*	No
328	Waxbills, Munias and allies	White-rumped Munia	*Lonchura striata*	No
329	Waxbills, Munias and allies	Tricolored Munia	*Lonchura malacca*	No
330	Waxbills, Munias and allies	Green Avadavat	*Amandava formosa*	No
331	Waxbills, Munias and allies	Red Avadavat	*Amandava amandava*	No
332	Wagtails, Pipits	Forest Wagtail	*Dendronanthus indicus*	No

333	Wagtails, Pipits	Western Yellow Wagtail	*Motacilla flava*	No
334	Wagtails, Pipits	Citrine Wagtail	*Motacilla citreola*	No
335	Wagtails, Pipits	Grey Wagtail	*Motacilla cinerea*	No
336	Wagtails, Pipits	White Wagtail	*Motacilla alba*	No
337	Wagtails, Pipits	White-browed Wagtail	*Motacilla maderaspatensis*	No
338	Wagtails, Pipits	Richard's Pipit	*Anthus richardi*	No
339	Wagtails, Pipits	Paddyfield Pipit	*Anthus rufulus*	No
340	Wagtails, Pipits	Blyth's Pipit	*Anthus godlewskii*	No
341	Wagtails, Pipits	Tawny Pipit	*Anthus campestris*	No
342	Wagtails, Pipits	Long-billed Pipit	*Anthus similis*	No
343	Wagtails, Pipits	Tree Pipit	*Anthus trivialis*	No
344	Wagtails, Pipits	Olive-backed Pipit	*Anthus hodgsoni*	No
345	Finches	Common Rosefinch	*Carpodacus erythrinus*	No
346	Buntings, New World Sparrows and allies	Crested Bunting	*Emberiza lathami*	No
347	Buntings, New World Sparrows and allies	Grey-necked Bunting	*Emberiza buchanani*	No
348	Buntings, New World Sparrows and allies	Striolated Bunting	*Emberiza striolata*	No
349	Buntings, New World Sparrows and allies	Black-headed Bunting	*Emberiza melanocephala*	No
350	Buntings, New World Sparrows and allies	Red-headed Bunting	*Emberiza bruniceps*	No

The above species belong to the following 76 families:

Anatidae, Phasianidae, Caprimulgidae, Hemiprocnidae, Apodidae, Otididae, Cuculidae, Pteroclidae, Columbidae, Rallidae, Gruidae, Podicipedidae, Phoenicopteridae, Turnicidae, Burhinidae, Recurvirostridae, Charadriidae, Rostratulidae, Jacanidae, Scolopacidae, Glareolidae, Rynchopidae, Laridae, Ciconiidae, Anhingidae, Phalacrocoracidae, Threskiornithidae, Ardeidae, Pandionidae, Accipitridae, Tytonidae, Strigidae, Upupidae, Bucerotidae, Coraciidae, Alcedinidae , Meropidae, Megalaimidae, Picidae, Falconidae, Psittaculidae, Pittidae, Vangidae, Aegithinidae, Campephagidae, Laniidae, Oriolidae, Dicruridae, Rhipiduridae, Monarchidae, Corvidae, Stenostiridae, Paridae, Alaudidae, Pycnonotidae, Hirundinidae, Phylloscopidae, Acrocephalidae, Cisticolidae, Sylviidae, Timaliidae, Zosteropidae, Certhiidae, Sturnidae, Turdidae, Muscicapidae, Muscicapidae, Chloropseidae, Dicaeidae, Nectariniidae, Passeridae, Ploceidae, Estrildidae, Motacillidae, Fringillidae and Emberizidae.

Acknowledgement:

We thank the following persons for their assistance. Sanika Shreekant Dhivre, Anurag Ajay Chandak, Tejas Ramesh Potdar, Swapnil Gajanan Kotkar, Mahesh Kulkarni, Abhay Patil.

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Ela Foundation is a non- government registered charity devoted to nature education, research, conservation and public health.
(EJFW was strated as a Newsletter in 2012)

ISSN 2319 - 2461 CC BY NC ND

Journal for Private Circulation only

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