

Citizen Science Initiatives in India: An Evaluative Study

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W: http://anupkumardas.blogspot.com



www.natureasia.com/en/nindia/article/10.1038/nindia.2018.142

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involving everyday people.

India's birds and mammals are getting help from research

flight

Citizen science projects take

doi:10.1038/nindia.2018.142 Published online 15 November 2018

important species. reporting wildlife sightings, are benefitting some vulnerable and ecologically Early results of citizen science projects in India, fed by thousands of people

scale observational data. professional and amateur scientists to collaborate on research that needs large-Citizen science, which has gained currency across the world, allows

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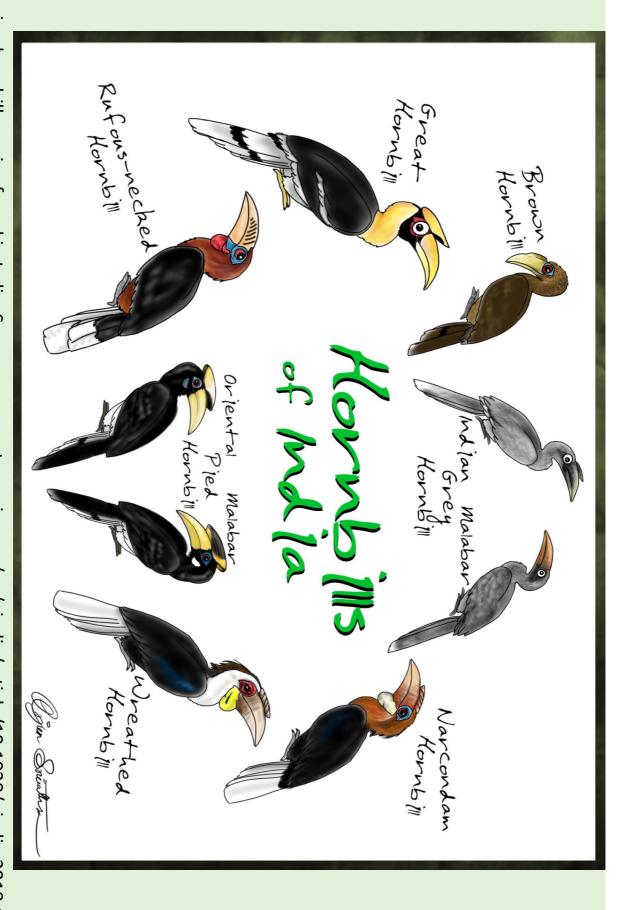












The nine hornbill species found in India. Source: www.natureasia.com/en/nindia/article/10.1038/nindia.2018.142



PAVILLION

efforts. evaluation of conservation decision for conservation and science will help making timely distribution based on citizen policy. Time scale data on science, conservation and initiative doing wonders for The 'State of India's Birds' report is the first example in trends of bird population and India of a citizen science





THE CONVENTION ON MIGRATORY SPECIES **CONFERENCE OF THE PARTIES TO**



17th - 22rd February, 2020











Director, Wildlife Institute of India

DR. DHANANJAI MOHAN







Website: https://www.stateofindiasbirds.in

The State of India's Birds report is the first comprehensive assessment of the distribution range, trends in abundance, and conservation status for most of the bird species that regularly occur in India. With their ubiquity and ecological importance, birds are excellent indicators of the state of our natural world and are potent cultural symbols of nature. This national-level assessment of birds is a significant step forward in the monitoring and conservation of India's rich and varied biodiversity.





Highlights

867

species of Indian birds assessed in this report

10,000,000

observations by birdwatchers form the basis of the analyses

100%

past decades increase in the abundance of peafowl across the country over the

52%

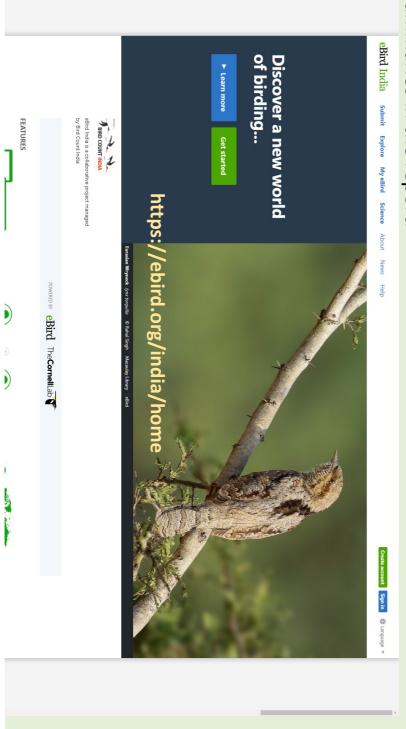
of species show clear declines over the past decades

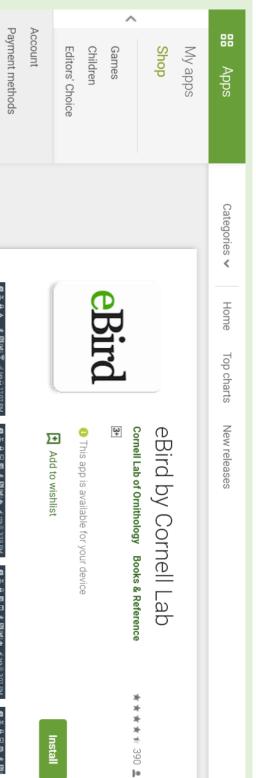
101

species classified as of High Conservation Concern, and require immediate attention

eBird: CS-based Observational Data

- The primary data used in the report is the 10+ million observations uploaded by Indian education and conservation. birdwatchers to eBird, an online birding notebook. Data on eBird are freely available for research,
- The data from birdwatchers observations was combined with supporting information for each species — including their taxonomic grouping, their habitat, endemicity and diet — to create the summaries in the report.





https://play.google.com/store/apps/details?id=edu.cornell.birds.ebird

日本日本 * [3]元は * / 5本日12.02 PM 16 Aug 2019 Start checklist RECORD TRACK The Cornell Lab 12:02 1 + + Sedge Wren Barn Cwl o Rock Pigeon (Feral Pigeon) Northern Harrie Osprey o Great Egret Green-winged Test 18 Jan 7:11AM 9 0st Hde 自 × 自 思 □ ★ 図 | 00 / 00 ★ 』 | 301 P | 39 Species Oxbow Meadows 6 Gadwall Traveling + 32 Common Golden 18 Jan 7:

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Parent guide

eBird Mobile makes it easy to record the birds you see in the field, and seamlessly link these observations with eBird--a global online database of bird records used by hundreds of thousands of birders around the world. This free resource makes it easy to keep track of what you see, while making your data openly available for scientific research, education, and conservation. eBird Mobile is the only app that passes information directly from the Android device to your eBird account on the web.

eBird Mobile

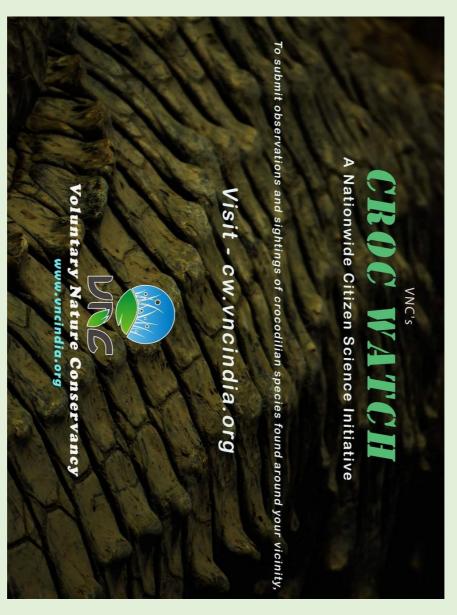
"eBird Mobile makes it easy to record the birds you see in the field, and seamlessly link these observations with eBird--a global online database of bird records used by hundreds of thousands of birders around the world. This free resource makes it easy to keep track of what you see, while making your data openly available for scientific research, education, and conservation. eBird Mobile is the only app that passes information directly from the Android device to your eBird account on the web."

Installs: 100,000+

Offered By: Cornell Lab of Ornithology Available in 27 languages on iOS and Android, all for free.

"Easy data entry from the field, even when offline. All your lists and stats in your pocket. Wherever you go, eBird is there."

Other Citizen Science Projects





crocodilian species found in India and to create a database that can aid in the research and conservation of these species. "Croc Watch is a citizen science initiative by Voluntary Nature Conservancy (VNC) to collect information on the three The project relies on participation of individuals to contribute to sightings and other information. We are looking for records and/or images of the three species of crocodilians found in India". https://cw.vncindia.org

India Biodiversity Portal Indiabiodiversity.org

Free and open access to India's biodiversity information.

through public participation and provide open and free access to biodiversity information. A unique repository of information on India's biodiversity. The Portal aims to aggregate data

Features



Species information

authenticated sources. Help collaborate and build information on India's species Descriptive pages for every species of India from



Citizen Science

of any species sighted. Other members help identify, annotate Any member of the general public can upload an observation and curate the observations.



map layers through an interactive web-GIS module Interact online with multiple layers of spatial data served as



Biodiversity Literature

metadata and tags. Peer reviewed and grey literature uploaded by members or in partnership with biodiversity journals, organized with



laxonomy

allowing for dynamic updates for organizing and querying species data, curated by experts. Taxonomy and nomenclatural information on India's species



Landscapes

literature on it. *Coming soon* information on spatial boundaries, species lists and relevant Aggregating information on India's Landscapes with detailed



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Communities

Microsites on the portal allow communities dedicated to

Open Data

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Partners







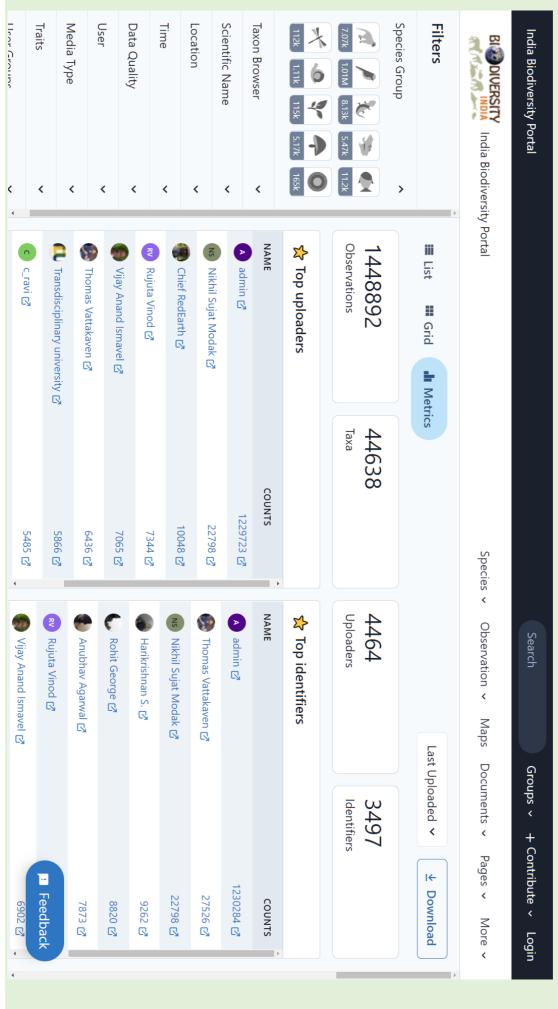








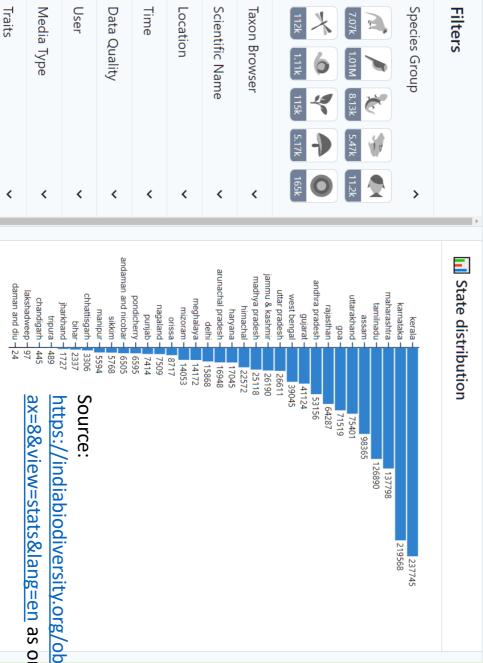
India Biodiversity Portal: Statistics



India Biodiversity Portal



Species v



Species Group Distribution of Observations by

Plants Birds Fish **Amphibians Mammals** Reptiles Arthropods 11.2k 8.13k 7.07k 7.07k 5.47k 5.17k 1.11k 115k 112k

Fungi

Mollusca

Others

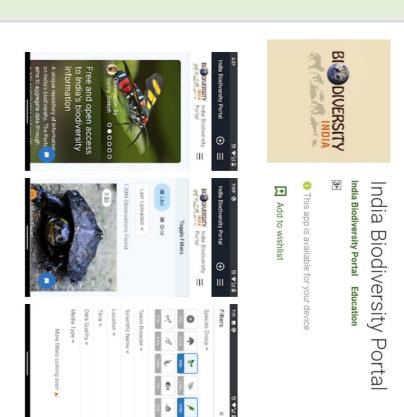
https://indiabiodiversity.org/observation/list?sort=created_on&offset=0&m

ax=8&view=stats&lang=en as on 18-03-2021

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India Biodiversity Portal: Android Apps



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Search in Tree

Bryozca
 Cephalorhyn
 Chaetognath
 Chaetognath
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 Chodata
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 Coleolidae

know about, document and share? Curious about all the different species present near you? See a plant or an animal species you want to

precious biodiversity through citizen science. Access to the app is via a simple registration and login The India Biodiversity Portal (IBP) Android app now allows you to map the Indian sub-continent's

Included in the app are the

Installs: 5,000+

Kerala Bioblitz

India Biodiversity Portal Education



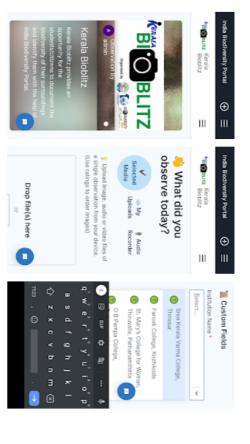
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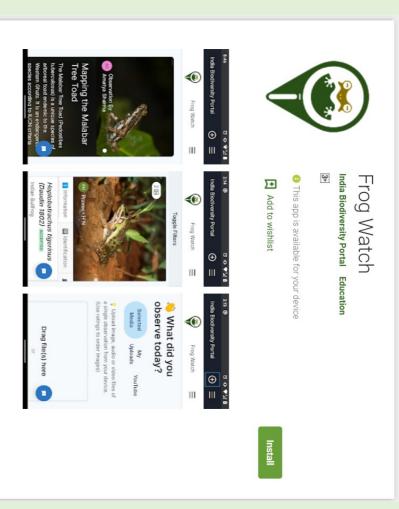
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of India Biodiversity Portal. Documentation methods include photography, videography, and sound students/citizens to document the biodiversity of their surroundings and identify them with the help and fauna disappear from Earth each day forever. Here, Kerala Bioblitz provides an opportunity for the Documentation of Biodiversity is the foundation of any conservation action as many species of flora recording.

Installs: 100+

India Biodiversity Portal: Android Apps



Frog Watch aims at mapping amphibians (frogs and toads, caecilians and salamanders) based on data that include observations, photographs, call records, identifications, locations, behaviours and so on collected by citizens and citizen science programmes in India.

WHAT'S NEW

Initial launch of Frog Watch

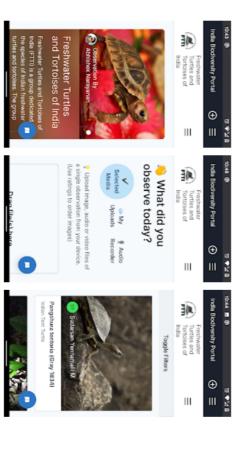
Installs: 100+

Freshwater Turtles and Tortoises of India (FTTI) India Biodiversity Portal Education

Ψ

This app is available for your device

Add to wishlist



Installs: 50+

This app includes information on the freshwater turtles and tortoise species of India with speciespage information on their identification features, habitats, geographical distribution, and basic ecology. It also includes a citizen science observations component for participants to upload sightings of turtles and tortoises from across the country and identify them. FTTI provides a platform for students, researchers and biodiversity enthusiasts (especially herpers!) in documenting much

India Biodiversity Portal: Android Apps



Bhutan Biodiversity Portal

India Biodiversity Portal Education

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we enable login through Gmail and Facebook.*** used in facebook, by clicking the Forgot Password link, and use that to login. Please bear with us unti *** Facebook and Google login is temporarily disabled. You can associate a password with the email

Curious about all the different species present near you? See a plant or an animal species you want to

Installs: 500+



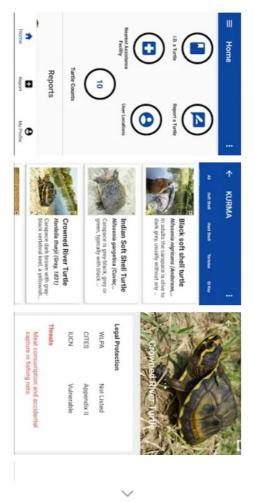
KURMA: Tracking Indian Turtles

Turtle Survival Alliance India Education

**** 50 .

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Action Network. This has been done as part of the nation-wide citizen science initiative-- Indian Turtle Conservation

Installs: 1,000+

Offered By: Turtle Survival Alliance India

Covers 29 species of freshweit laces so lence initiative of TSAI Built in digital field guide This has been done as part of the nation-wide

Citizen Science in Monitoring AQI

badri.chatterjee@hindustantimes.com

airqualitymonitors with Pakistan to set up real-time tion, India has begun working collaborations to tackle air pollufirst attempts at transboundary KATHMANDU/MUMBAI: In one of the

on air pollution across several or citizens to get timely updates mality)Initiative in Islamabadis akistan Air Quality (PakAir roviding open data in Pakistan rbanSciences in Mumbai and air pollution researchers from citizen science collaboration

areworner cities reporting particulate matter (PM2.5andPM10)data.Ateamin online in Karachi on Friday, week. The first monitor went an air pollution conference orga Karachi, Lahore, Islamabad and nised by the US state department ty monitors to be installed in ngfunds for additional air qual-Pakistan is in the process of rais-Camp in Kathmandu, Nepallast Clean Air for South Asia' Tech-The decision was taken during

United Arab Emirate

49.9

44.8

Nigeria

directly, the official added. stan, different provinces are as the government was not disdata wasınsufficient in Pakistan cials, at the sidelines of the conment does not get involved tion, while the central governresponsible for recording and pensing necessary funds. In Paki ference, told HT that air quality naintaining air quality informa Pakistani government offi

Agency (JICA) from as early as major cities obtained under a dated air quality equipment for

TOP 10 MOST POLLUTED COUNTRIES IN 2018

(FOR ESTIMATED PM2.5 ANNUAL AVERAGE CONCENTRATION) – in μg/m³ WHO safe standard for PM2.5 India's safe standard for PM2.5 Pakistan's safe standard for PM2.5



Public readings generate awareness, which drives the

method to improve quality accessible is an effective

Increasing the number of information real-time highly localised accelerates access to demand for action

quality monitoring stations

(Source: 2018 World Air Quality Report releatin March by non-profit Greenpeace and IQ Air Visual, a software company that tracks pollution worldwide)

SITUATION IN INDIA

In India, air quality is being monitored at 779 locations covering 339 cities in 29 states and six union territories across the country, under NAMP

Further, real-time monitoring is taking place at 170 locations in 103 cities in 18 states and UTs, according to Union environment ministry. Additionally, under the

NCAP, environment ministry has released funds for installation of 65 continuous ambient air quality monitoring stations across 13 states and one UT by 2020.

Baloch, deputy director of the in 2019," said Zaigam Abbas not sure how effective the data is parameters (sate limits), we are stringency of international still being used. Considering the 2012, the air quality monitors are 2007. While the project ended in

other cities." erated for Islamabad, which needs to be replicated across real-time updates are being genafter 24 hours. However, near time, but we are able to provide it Change "The data is not real-Agency, Ministry of Climate

> Peshawar, Quetta, and Islamaies namely Karachi, Lahore ity monitoring stations across citcurrently has 20 manual air qual-

Climate Change had reached out bad. Baloch said the Ministry of

According to Baloch, Pakistan

urgency of addressing the health to the Pakistan government for more funds, considering

Pak Environment Protection

project can't benamed as of now, standards, and we do not consider by China," he said, adding, "Citibut we will enhance our monitor. 'The goal of this initiative is

this as our official data. wo countries," ssue of air pollution between the arger goal of this collaboration based air quality monitoring ill the gaps in the government ty has the power and potential to er address the transboundary frictals and policy makers to bet uality between citizens, civic nformed dialogue around all nd initiative is to enable a more irector, UrbanSciences. aid Ronak Sutaria, founder and Citizen science-based air qualhesaid

nent's Bureau of Internationa eam under the US State depart enior consultant, TechCamp priority," said Jamie Findlater. o promote local, national and akAirQuality team. "Our aim is nonitor was handed over to the oncluded TechCamp, the first by UrbanSciences. In the recently Realtime Air Quality' monitors cientifically validated 'Atmos howed interest in India's first 018 when PakAirQuality team lean air as a global environment ross-border efforts to address uring a conference in December The idea was first discussed

en network of 40 low-cost an akAir Quality Initiative, a citiaid there was no official realuality monitors across 10 cities

Pak works with India to get air quality monitors REAL-TIME AIR QUALITY MONITORS

ingsituation and it will be funded to enable a more informed zen movements (mostly spon- dialogue around air quality quality vis-a-vis Pakistan's safe address the transboundary they are not fit for monitoring air citizens and policy makers to soredby the US) are welcome, but to be undertaken between issue of air pollution

TOP 10 MOST POLLUTED COUNTRIES IN 2018

58.5 µg/m³ 61.8µg/m³

54.2µg/m³

Making air quality data WHY IT MATTERS **REAL-TIME DATA:**

and Pakistan Air Quality (PakAir-Quality) Initiative in Islamabad has helped provide open data in Pakistan for citizens to get timely updates on air pollution across sev-eral major cities. The decision was taken during from UrbanSciences in Mumbai orations to tackle air pollution, India has begun helping Pakistan KATHMANDU/MUMBAI: In one of the first

India's safe standard for PM2.5 annua average concentration – 40µg/m³

2018 World Air Quality Report d in March by non-profit

online in Karachi on Friday report-ing particulate matter (PM) 2.5 and PM10) data. A team in Pakistan is in the process of raising funds for additional air quality monitors to be installed in Karachi Lahore, Islamabad and few other cities. an air pollution conference orga-nised by the US state department's 'Clean Air for South Asia' Tech-Camp in Kathmandu, Nepal, last week. The first monitor went

inga conference in December 2018
when PakAirQuality team showed
interest in India's first scientifically validated 'Atmos- Realtime
Air Quality' monitors by Urban-The idea was first discussed dur-

are responsible for recording and maintaining air quality informa-tion as the central government does not get involved directly, an In Pakistan, different provinces

"We are currently using out—air quality monitoring stations dated air quality equipment for across-cities like Karachi, Lahore major etites obtained under a Peshawar Quetta and Islamahad apaun International Cooperation — Baloch added that the ministry Agency (JICA) in 2007. While the orchance though that excelled up project-onled through the monitors to the Pakistan government for are still being used. Considering more funds considering the health the stringency of international ungency of adoressing the health.

t. "The data is not real-time but we sareable to provide it after 24 hours. I discover, near real-time updates are being generated for Islamabad, are being generated for Islamabad, at which needs to be replicated across the differenties." According to Baloch,

il romnentalisktohedithcurrently
s with an estimated seven million
premature deaths every year,
decording to the World Health
y Organisation).
The 2018 World Air Quality
the The 2018 World Air Quality
r Report released in March by nonthe sould, a software company that

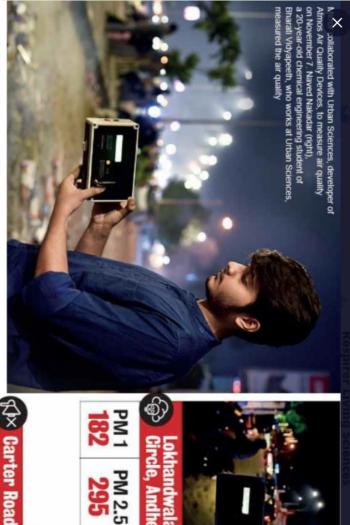
air quality vis-a-vis Pakistan's safe standards, and we do not consider this as our official data." sponsored by the US) are we but they are not fit for moni Air pollution is the greatest envi-ronmental risk to health currently

Open Data in Pakistan for citizens to get timely updates on air UrbanSciences in Mumbai (@UrbanSciencesIN) and Pakistan Air A Citizen Science collaboration by air pollution researchers from pollution across several major cities. Quality (@PakAirQuality) Initiative in Islamabad is providing



otmos resistant salt quality

Respirer Living Sciences @urbansciencesIN



even wearing masks. measurement devices, volunteers scrambled as people rushed to burst crackers, many Nakadar to check the air quality this Diwali. Armed with decibel meters and air quality Foundation to see how noisy the city was and Urban Sciences employee Naved Mumbai Mirror conducted a pollution test drive and joined volunteers of Aawaz

ig/m3 , while in 2018 (Nov 7, 9 pm to Nov 8, 9 am, the PM 2.5 average was 305ig/m3." (Oct 19, 9 pm to Oct 20, 9 am) the 12-hour average of PM 2.5 level in Mumbai was 366 compare how Mumbai fared in its attempt to curb pollution, Sutaria said, "Last Diwali Citing data from the US Consulate's air quality measuring website airnow.gov to



PM 2.5 295

PM 10

on Diwali night to find PM2.5

Mumbai with our researchers

@MumbaiMirror drove around

build impactful narratives

provides a powerful tool to Data-driven Journalism engagement combined with

<u> Litizen-science led civic</u>

above 200 ug/m3 at all

locations.



90.6 dB - 107.6 dB

mumbai/civic/d... mumbaimirror.indiatimes.com/

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7:40 AM · Jul 9, 2020 · Twitter Web App







3

the sky. We left the spot at 9 pm. aerial multi-shot cracker went up to the highest reading of 107.6 dB when an into the big bang mode. We recorded started shooting up as soon as they got duty firecrackers. The decibel meter 8.30 pm, a group arrived with heavywere out to burst crackers. Around with people on Diwali night, but not all The popular hangout spot was buzzing

PM 1 PM 2.5 200 333

0

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Other Documented Citizen Science Projects

ScienceAtHome project 'Quantum Moves'	Zooniverse (originally Galaxyzoo)	iNaturalist	Name of Projects
Gamification as a tool Played BringH to find solutions to omeWater 8 complex research million times problems of quantum computing.	The pattern recognition Classified capability of the human more than brain for the classification of galaxies galaxies.	Online platform for 13 Million mapping and sharing observations regarding biodiversity worldwide.	
Played <i>BringH</i> omeWater 8 million times	tion Classified nan more than 98 the million of galaxies	13 Million observations	
150 Thousand players (till publication in 2016)	End of 2019, nearly 2 million users	By end of 2019, 1 million users	ŶŶŶŶ
Article accesses is 3736 according to Altmetric (October 2020)	Contributed to over https://www.zooniv 160 research erse.org articles	Cited in 228 https://www.inaturresearch articles in alist.org/stats/201 2019 alone 9	98
https://citizenscie ncegames.com/ga mes/quantum- moves/	https://www.zooniv erse.org	https://www.inatur alist.org/stats/201 9	Reference

Some successful citizen science projects.

Source: Namdeo, SK and Koley, M (2020). *Citizen Science in India: Introduction, Challenges and Way Forward*. https://www.dialogue.ias.ac.in/article/30161/citizen-science-in-india-introduction-challenges-and-way-forward

Possible challenges with citizen science projects at a glance



Very Small Subset of Research Projects Suitable for Citizen Participation

> Volunteer Recruitment and Retaintion

Finnancial Sustainablity

Data Quality & Data Reliablity

Data Ownerships

Source: Namdeo, SK and Koley, M (2020). *Citizen Science in India: Introduction, Challenges and Way Forward*. https://www.dialogue.ias.ac.in/article/30161/citizen-science-in-india-introduction-challenges-and-way-forward

Institutionalization of Citizen Science Projects in India: As Proposed for STIP2021 Possible National Framework and Stakeholder Engagements for the (Science, Technology and Innovation Policy 2021)



- Commision a study to set projects. guideline for citizen science
- citizen science projects and all information related Develop a national portal for Fund Allocation for Citizen stakeholder engagement science projects. to

Tier-II & Local

Design and lead citizen Science Project with cross disciplinary engagements

- Design and execution of in parts or whole citizen science projects
- Funding arrangements International national collaboration

with HEIs

Proposed Flexible Engagement Stakeholder Structure

Department of Biotechnology Govt. of India

guidance, community engagement and data analysis, data quality, volunteer Include directions for data collection, result accessibility

National Portal for Citizen Science

to relevant guidelines and best practices science initiatives- online registration and access Dashboard to act as a repository of all citizen

Science Academics (IAS, NASI,

- Guideline preparation.
- Facilitate engagements of HEIs into the Citizen Science Projects.
- especially the social scientists, in citizen science crossdisciplinarity engagements

Top Tier Institutions like, IISc, NCBS, IITs, TIFR, IISERS, CISR Labs etc

- May collaborate with Academies for guideline preparation.
- May take up active participations in development of Citizen Science Portal
- Design and lead citizen Science Project with cross disciplinary engagements.
- National and international collaborations

Thank You!!

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