## Kathmandu Institute of Applied Sciences 2014-2021







# Seven Years in Science:

Achievements and the way forward

Kathmandu Institute of Applied Sciences 2014-2021

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## **About** KIAS



Kathmandu Institute of Applied Sciences (KIAS) is an autonomous, nongovernmental and not-for-profit multidisciplinary research organization founded by a group of scientists with proven excellence in research that ranges from biodiversity, climate change to development of new technology for biological and chemical analyses.



## KIAS's Mission

To support for a prosperous and sustainable Nepal through scientific research, innovation, outreach and training

KIAS strives to serve our society and nation via scientific research that fosters knowledge-based intervention to tackle with existing and emerging challenges. KIAS conducts multidisciplinary research devoted to a specific problem through its specified research centers. KIAS organizes trainings, workshops, and science outreach programs targeting students, researchers and policy makers.



## Strategic objectives

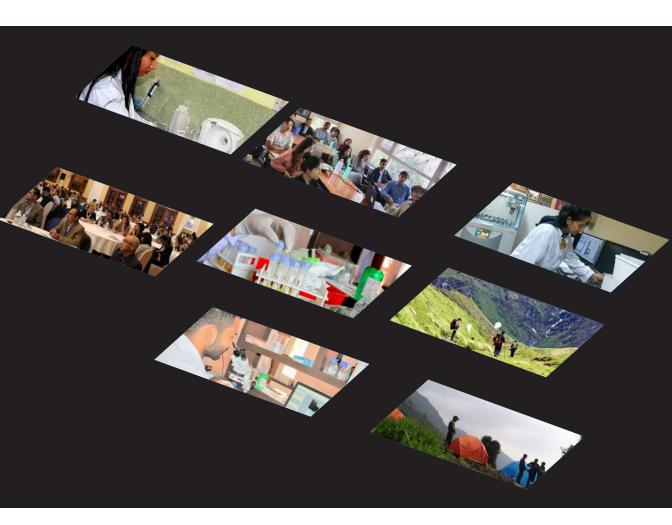
Strengthen research capacity through academic programs, trainings and outreach activities



Strengthen multidisciplinary research in nationally prioritized areas



Develop highvalue research products and promote sciencepolicy linkages



# **Organization** and Governance

Kathmandu Institute of Applied Sciences is governed by its General Assembly. The Assembly makes strategic decisions and selects an Executive Committee. The Executive Committee is responsible for the day-to-day administration of the organization.

KIAS conducts research through its three constituent research centers, devoted to the specific domain of scientific research. Research centers share resources for collaborative research and outreach related activities. The Research Support Committee foresees administrative and logistic needs of the research projects. Research Ethics Committee works with research team to make sure ethical compliance of research projects is followed and maintained.



# **Transforming**Research and Training

### A Message From the Executive Director

When we founded Kathmandu Institute of Applied Sciences (KIAS) seven years ago, we were both thrilled and nervous about our future. We, the founding members of KIAS, were trying to adjust in government research organizations or private academic institutions hoping to work in science after completing our doctoral scholarships abroad. We soon realized that if we want to involve in research. a bold action with a vision is needed. We chose a difficult path of establishing a non-profit research organization although we had no funding for office space, staffs and research projects. KIAS is now a well-known premier research institution in Nepal. We published 40 research articles, secured 17 grants, brought together 116 research staff, directly trained 80 young researchers, organized five international conferences, interacted with thousands of scientific communities around the world. and established three full-fledged research centers. What we contributed to our society and achieved as an institution in the last seven years is remarkable. As a founding President and Executive Director, I thank our funding agencies, collaborators, research staff, students and my colleagues for their extraordinary support.

We are aware that a research organization like ours—a self-made institution with no support from public funding and government incentives— have to endure with plenty of unprecedented challenges. The COVID-19 pandemic has increased uncertainty, but also



heightened the urgency of research in solving our own problems. We're incredibly proud of laying a foundation of this organization.

KIAS will continue working with renewed rigor, team spirit and vision, with expanding new research frontiers. We hope the Government of Nepal recognizes the science and paves ways to flourish institutions like ours. We will remain responsive and work with you in various ways. We need your support for our collective journey towards a prosperous and sustainable Nepal.

#### Prakash K Paudel, PhD

Executive Director Founding President

## **Our** Achievements



Kathmandu Institute of Applied Sciences completed a number of research and outreach projects in the last 7 years.



## **40** PUBLICATIONS

including books, book chapters and peer-reviewed journal articles



## 17 GRANTS SECURED

mostly research and capacity building grants



## 116 PEOPLE WORKED

including research scientists, postdoctoral scientists and support staff



#### 85 YOUNG RESEARCHERS TRAINED

including research interns and thesis students



### 49 EVENTS ORGANIZED

including short courses, seminars and international conference



## 102 RESEARCHERS COLLABORATED

20 countries from Europe, South America, North America and Asia







Dr. Laxman Pokharel



Dr. Madhu Sudan Kayastha





Dr. Prakash K. Paudel

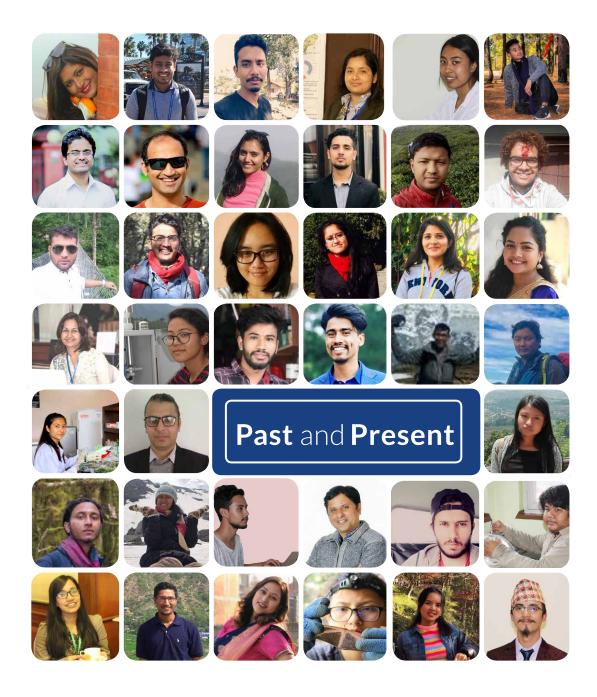


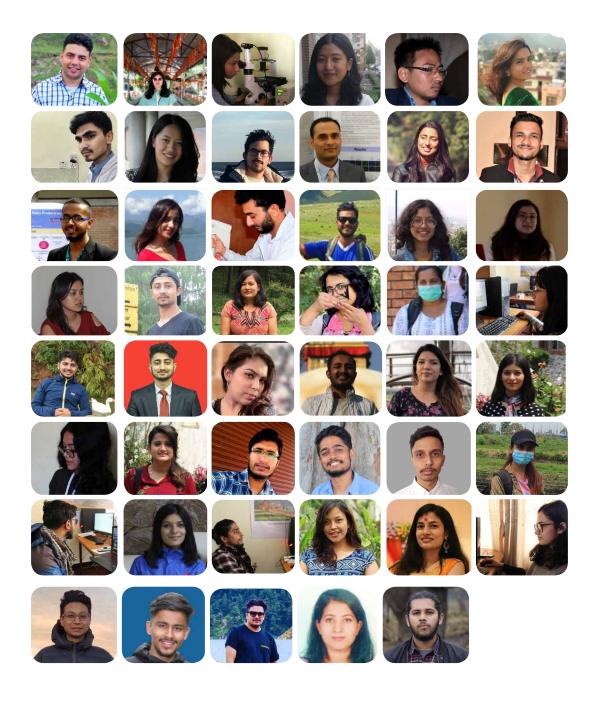
Dr. Rashila Deshar



Dr. Susma Giri

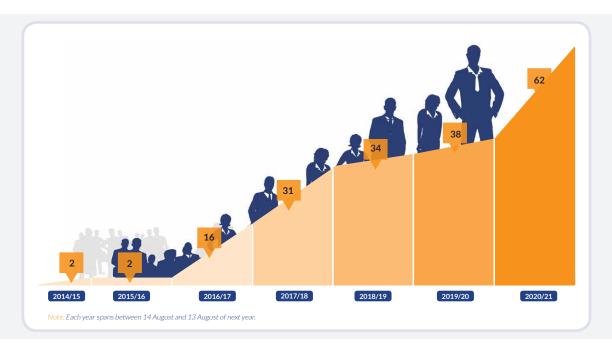
## Our Team





## **KIAS** Workforce

(August 13, 2014 - August 12, 2021)





2

Senior Scientist



4



1

**Associate Scientist** 



3

Post-doctoral Research Associate



15

**Research Assistant** 



9

**Research Associate** 



**73** 

Research Intern, Thesis student



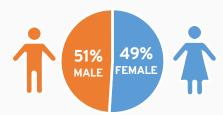
3

**Outreach Coordinator** 



b

Finance/Admin officer





**TOTAL STAFF** 

116

## KIAS Work

### Research, Innovate, Discover and Outreach

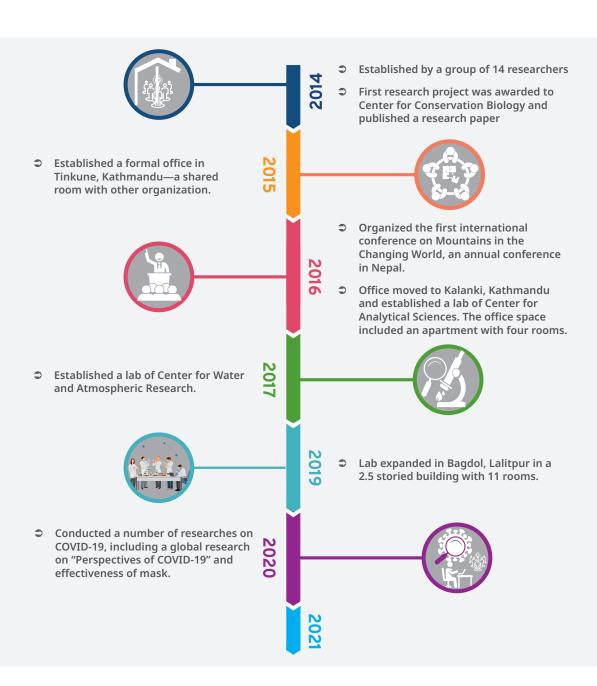


KIAS works in developing and sustaining a dynamic research culture that supports discovery, creativity and innovation. KIAS research priorities include a broad area ranging from climate change, environmental pollution, biodiversity conservation to screening quality of drugs, and of national, regional and international significances. These research works are carried out through three research centers. Some of multidisciplinary research projects of national and international prominence are commissioned at institutional level

(e.g., an EU funded project on Green Economy, research on public policy).

KIAS organizes trainings, workshops, and science outreach programs including short-term schools and conferences targeting students, researchers and scientists. One of the flagship events organized by KIAS is the *international conference* on Mountains in the Changing World (MoChWo), which is organized every year on October in Kathmandu, Nepal.

# **KIAS**Timeline



# **KIAS**Research Center

#### **Research Center**

Currently, there are three research centers in KIAS through which it implements various research and outreach activities.



# **Center for**Conservation Biology

Center for Conservation Biology (CCB) conducts a leading research on the wildlife ecology and conservation. It has carved out a unique niche for itself nationally, both in rigorous field-based expedition and metadata analysis that resulted more than 20 paper in peer-reviewed international journals.

CCB aims to contribute for a sound basis for the conservation, management, and restoration of Nepal's biodiversity and ecosystems.



### **Major Themes**



## Wildlife Ecology and Ecosystem

CCB conducts scientifically robust research to conserve Nepal's iconic, flagship and much ignored species (e.g., insects) that are representative of various ecosystems.



#### Ecological Restoration and Remediation

Many of ecosystems have been damaged owing to human modifications, natural disturbance and climate change. CCB investigates disturbed ecosystems to repair them back into natural stages.



#### Conservation Policy, Governance and Planning

CCB conducts policy research aimed at strengthening wildlife and natural resources conservation. Several instruments ranging from designing protected area, payment for ecosystem services, to conservation governance.



Conservation Education and Public Engagement for Community Stewardship to achieve Conservation Outcomes

CCB believes that partnership with local communities is critical to explore local solution, strengthen capacity and engage local community in conservation, for securing a healthy future for our planet.



### **Unravelling Himalayan Biodiversity**

Himalaya is a global repository of biodiversity but our understanding about species and their distribution patterns is very limited. CCB has been carrying out research expeditions in Nepal's remote mountains. This includes exploration of flowering plants, herpetofauna, mammals and lower plants. Insects diversity is one of the important research areas of the CCB.

#### **Projects**



Community-led conservation and restoring critical corridors of vanishing red panda population in Nepal.



Ecosystem based adaptation to disaster risk reduction



Insect diversity: distribution across altitudes and seasons at the Shivapuri-Nagarjun National Park



Himalayan cliff bees: pathogens and parasites



Community based pangolin conservation in Nepal



Biodiversity reconnaissance survey: status of threatened flora and fauna and their conservation in the mid-western Himalaya



Environmental communication: Mass media at crossroad

## Center for

## Water and Atmospheric Research

The Centre for Water and Atmospheric Research (CenWAR) explores and investigates the vast environmental issues involving either water or air at local, regional and international levels.



### **Major Themes**



## **Earth Observation for Environmental Analysis**

CenWAR uses remotely sensed and in-situ data to extract useful information such as a long-term monitoring of climatic disasters (e.g., drought) and air pollution.



#### **Atmospheric Pollution**

CenWAR investigates atmospheric pollution to evaluate the causes and patterns of air quality at varying temporal and spatial scales.



## Development of Low-cost instrument for climate resilience

CenWAR focuses on development of low-cost, portable and effective instruments (e.g., hydrometeorological station) to aid communities in improving resilience to climate change and disasters.



### **Environmental Protection in South Asia**

Many of the earth's resources (e.g., water and air) are especially vulnerable because they are influenced by human impacts across different regions. CenWAR objectives are to conserve natural resources and the existing natural environment and, where possible, to repair damage and reverse trends.

## **Projects**

#### Current



Air Quality and Environmental Impact Assessment of Industrial Activities in Kathmandu, Nepal.



Improving assessment of drought and its impact on food and water resources in South Asia.



Building low cost mobile weather station for drought study in Nepal.



Influence of transboundary air pollutants into the atmosphere of Kathmandu, Nepal.

## **Center for** Analytical Sciences

The Center for Analytical Sciences (CAS) focuses on developing new measurement systems/methods/techniques particularly appropriate for resource-limited and field settings. Most of these new and improved low-cost methods find their applications in environmental monitoring and screening of the quality of food and drugs.



### **Major Themes**



#### Low-cost measurement systems

CAS has been developing pointof-need analytical technologies for various applications in an effort to provide better access to various measurement technologies that are low-cost and affordable, easy to use and rapid but also robust, reliable, and suitable.



#### **Environmental pollution**

In an effort to understand the air pollution in Nepal and beyond, we analyze air samples including dust particles, particulate matter and employ remote sensing data in our research.



#### Food, water, and drug quality

One of the first steps towards providing safe food, water and drugs is to screen the quality of these essential products on regular basis. Our research involves screening the quality of food and water.



Many research projects at CAS are designed to address local problems using multidisciplinary and interdisciplinary approaches by bringing researchers from various fields such as chemistry, environmental science, engineering, artificial intelligence, microbiology & biotechnology etc. To achieve its objectives, CAS prioritizes collaborative research. Current collaborators are from Nepal, USA and UK.

### **Projects**



Development of a smart thin layer chromatography method for pharmaceutical analysis



Mapping of pesticide residue and (oo)cysts on vegetable and fruits using low-cost field-based assays.



Development of Novel Paper-Based Devices to Assess the Quality of Pharmaceuticals and Water in the Developing World



Development of low-cost alternatives for the quantitative determination of lipids and carbohydrates



Development of paper-based analytical methods for measuring total flavonoids, total phenolics and antioxidant activity of medicinal plants, 2015-2017

## KIAS

## Crosscutting Research

KIAS is carrying out cutting-edge research initiatives in cross-disciplinary areas that will contribute to critical advances in strategic research areas.

## Science & Public Policy Research



Science, Technology and Innovation (STI) is a key for nation's development as it contributes for new capabilities, supports to the wealth of nation, provides the basis for new goods and services. KIAS conducts research on economic, social, management and organizational aspects of STI with an aim of providing inputs to decision-makers.

#### **CORAM**



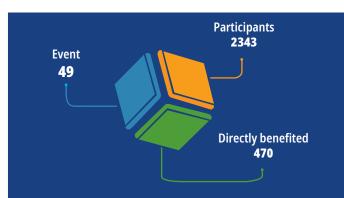
Community-based rainfall measurement (CORAM) is a joint initiative of several organizations, led by Kathmandu Institute of Applied Sciences. This program involves high school students and teachers to collect daily rainfall data using rain gauges with dual aim of providing the weather science education to school students and generating a large scale spatially explicit weather data in Nepal.

#### COVID-19



The novel coronavirus pandemic, known as COVID-19, is having a serious impact on people's health, livelihoods, economies, and behaviors. This pandemic has shaken us to our very core, and has created a moment to contemplate about the future, including our relationship with nature. Kathmandu Institute of Applied Sciences (KIAS) completed a number of research on 'global perspectives of scholars on the origin, spread and consequences of COVID-19, and effectiveness mask etc.)

KIAS organizes short courses, trainings conferences and workshops in several topics on regular basis.



Becoming a field biologist

International Conference in Mountain in the Changing World

Smartphone for chemical and biological analyses

A short course on "R" for scientifc data analysis

The nuts & bolts of publishing your research findings

A short course on paper microfluidics

Radio telemetry and research application in wildlife ecology

A short course on smartphone microscope



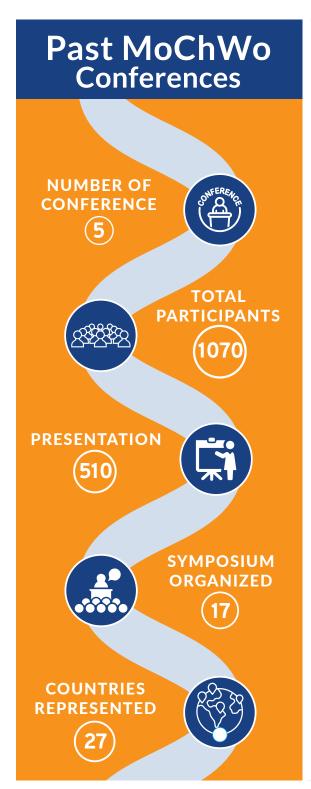
# International Conference in **Mountain in the Changing World**

Mountains are a part of global biodiversity repository and play vital role in maintaining global ecosystem and supporting millions of people. Mountains possess a large variation in landscape features and also act as global water towers. Similarly, mountains offer a 'niche or comparative advantage' at operational levels such as medicinal herbs, tourism and hydropower. In the meantime, they are the most vulnerable to the effect of global change. Data suggest that mountain communities are among the poorest and

most affected by development programs that are not tailor-made for mountain conditions.

Kathmandu Institute of Applied Sciences (KIAS) organizes international conference on October as a flagship annual program. The main objective of the MoChWo conference is to bring scientists, experts and researchers from government agencies, development practitioners and academia to share research frontiers on sustainable mountain development.













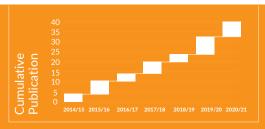
# **Institutional** Publication



## **Science Publication**

2014-2021

**OUTPUT, IMPACT, COLLABORATION** 





Review papers

1

1 Book chapters



2 Book



Total people collaborated 173



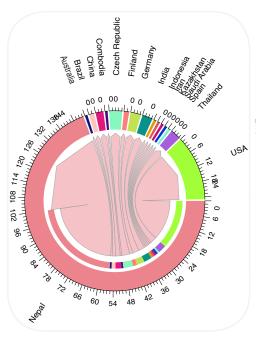
Countries collaborated

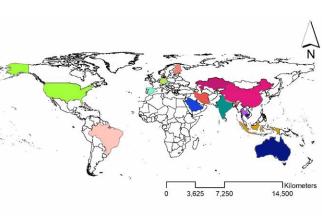
3 Perspective articles

3.78
Average Impact Factor

**4.83**Average Cite Score

**401** Total Citation





#### A Books

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- 2. Neupane, B., Pandey, B., Giri, B., Joshi, M. (2016). A text book of nanoscience & nanotechnology: fundamentals, applications & experiments. Heritage Publication, Kathmandu, Nepal.

#### **B** Book Chapter

3. Heinen, J. T., Baral, N., Paudel, P. K., &Sah, J. P. (2019). On the Road to Sustainability? A Review of a Half-Century of Biodiversity Conservation Successes in Nepal and Some Thoughts on Future Needs. In National Parks and Sustainable Future. Intech Open https://doi.org/10.5772/intechopen.84617

#### **C** Journal Article

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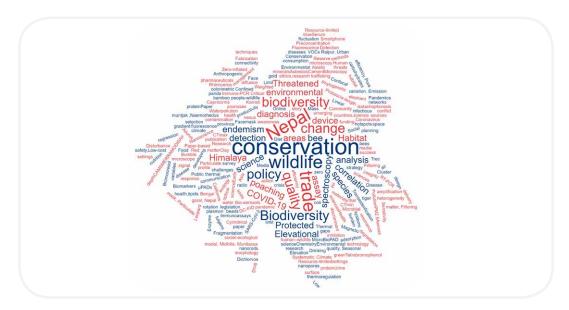
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## Thank You to Our **Partners**











ASIA-PACIFIC NETWORK FOR **GLOBAL CHANGE RESEARCH** 







































































































INTERNATIONAL FOUNDATION FOR SCIENCE

## KIAS Partnership with **Professional Societies**

Kathmandu Institute of Applied Sciences promotes a high standard of professional integrity in the field of science and technology and allied fields. KIAS is privileged to provide secretariat office for Society for Conservation Biology Nepal (SCBN), Organisation of Women in Scientist Nepal (OWSD Nepal Chapter) and National Young Academy of Nepal (NaYAN)

Society for Conservation Biology Nepal (SCB Nepal) is a non for profit, non-governmental and professional membership organization. It also serves a National Chapter of "Society for Conservation Biology".





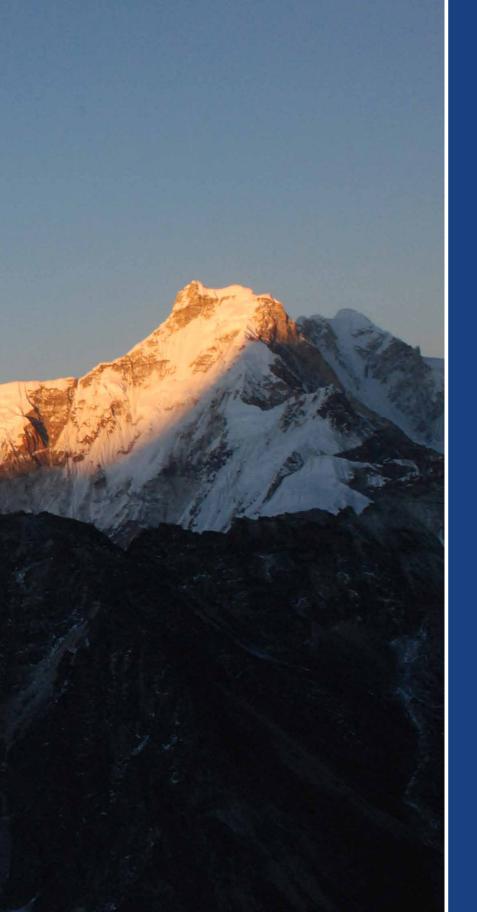
Organisation of Women Scientist in Nepal is a non-profit and nongovernmental organization established to enhance the participation of women in scientific and technological research. OWSD Nepal serves National Chapter of "Organization for Women in Science for Developing World".





National Young Academy of Nepal (NaYAN) is an autonomous organization that aims to bring young scientists from different disciplines together, engage with business, civil society, media, and government, nurture early-career young scientists, and foster interdisciplinary and multidisciplinary collaboration among them.





## Kathmandu Institute of Applied Sciences

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