

# Final Workshop Report

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Center of Excellence for Environment and Climate Change

December 16, 2019

Asta-Ja Research and Development Center, Kathmandu, Nepal

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Supported by

**NRNA USA and Asta-Ja USA**

**Based on the recommendations from NRNA ICC's America's Regional Expert Conference held on June 16-17, 2018, in San Francisco, California, USA, and the 1<sup>st</sup> NRN Global Knowledge Convention: Expanding Nepal's Knowledge Pool through Diaspora, 12-14 October, 2018 Kathmandu, Nepal.**

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## OVERVIEW

### **Organization of the Workshop**

A one-day workshop on December 16, 2019, was organized by Asta-Ja Research and Development Center in Kathmandu, Nepal. Experts and researchers engaged in the field of climate change and environmental quality, students, officials from government agencies, and individuals interested in the climate change and environmental issues were invited to the workshop. The main objectives of the workshop were:

- (1) To discuss the modality of the Center of Excellence (CE).
- (2) To develop strategies for the Center of Excellence.
- (3) Develop a concept document to create Center of Excellence.

Deliverables from this workshop included:

- (1) A concept document with vision, mission, goals, and a roadmap.
- (2) A dedicated working group for implementation.

### **Evaluation of the Current Status**

Pollution is the major environmental and societal problem specially in developing countries mainly in South Asia including Nepal. Air pollution has impacted on many sectors from health, ecosystem, tourism, crop yields, weather etc. About 35,000 people died prematurely due to poor air quality in Nepal in 2016, and countless illnesses (Global Burden of Diseases, 2016). Solid biomass fuel is a principal source of energy used for domestic purposes in low- and middle-income country like Nepal. Household air pollution (mainly indoor air pollution) is a major risk factor associated with causing chronic obstructive lung disease in adult and acute respiratory infection in children. Vehicular pollutants include CO, CO<sub>2</sub>, HCs, NO<sub>x</sub>, SO<sub>2</sub>, VOCs, lead and particulate matters which have damaging effects on both human health and ecology. Diesel-driven vehicles emit particulates that are very fine and a large proportion of them are less than 2.5 microns in size, which can penetrate deeper into our lungs. These pollutants are believed to affect the respiratory and cardiovascular systems. Uncontrolled growth of vehicle population, poor transportation infrastructure, traffic congestion, driving patterns and inefficient public transportation systems are major factors in increasing vehicular pollution levels. Waste burning is a common waste management technique used in most of the pre-urban parts of our country, people find this method is simple, easy and less time consuming. In cities, open waste burning to manage garbage is a

common practice. The smoke released from the waste contains vulnerable gases like carbon dioxide, carbon monoxide and sulfur dioxide.

Around 950 brick kilns are operational throughout the country. Around 110 of those are located inside the Kathmandu Valley. Amongst various types of brick kilns; Induced Draught Zigzag (FDZZ), Natural Draught Zigzag (NDZZ), Natural Draught Straight-Line Kiln (NDSL) are the most common ones in Nepal. Brick industry provides employment to 175,000 workers which annually produces 3.2 billion bricks with estimated huge investment of ~US\$36million. However, the operational patterns in brick production has created the environmental and social implications in the brick manufacturing industry. Various aspects like type of fuel or fuel mixture used, brick stacking and firing pattern, technical strength of workers, overall brick kiln design, etc. play important role in both efficiency and environmental performance of brick kiln. If such aspects are considered with a high importance by the stakeholders, brick industry will be more efficient, economical, and environmentally friendly as well as brick factories will abstain from increasing social challenges. Construction activities that contribute to air pollution include: land clearing, operation of diesel engines, demolition, burning, and working with toxic materials. All construction sites generate high levels of dust (typically from concrete, cement, wood, stone, silica) and this can carry for large distances over a long period of time. Construction dust is classified as PM10 - particulate matter less than 10 microns in diameter, invisible to the naked eye. Research has shown that PM10 penetrate deeply into the lungs and cause a wide range of health problems including respiratory illness, asthma, bronchitis and even cancer. Another major source of PM10 on construction sites comes from the diesel engine exhausts of vehicles and heavy equipment. This is known as diesel particulate matter (DPM) and consists of soot, sulphates and silicates, all of which readily combine with other toxins in the atmosphere, increasing the health risks of particle inhalation.

Garbage pollution arises when the waste in dumping sites keeps rotting, spreading odor and cause air pollution in the surrounding areas, which also creates problems at the administrative level. It is often seen that waste including inorganic material such as iron cans, paper, plastic, glass pieces, or leftover food, animal bones, vegetable peels etc. are dumped in the open space. Rivers are also polluted by industrial and household wastes. Increasing disposal of solid waste and sewerage, as well as discharge of industrial effluents into in the water sources is spoiling the landscape. Research shows that Nepal has received poor air quality from the neighboring countries and even having a greater pollution impact over the Himalayan Region changing the color of snow, melting of ice in the Himalayan region.

Environment and climate change issues are critical for GoN and Nepali citizens. It requires a good scientific understanding of source of air, water, soil pollution and its effect on human health and climate. It is important to have a reliable quantitative data to develop a national level legislation and policy to manage the problems. Education, awareness, participation and behavioral change of community will be critical to successfully manage and implement a sustainable management system for environmental and climate change issues. According to the World Health Organization

(WHO), air pollution causes detrimental health consequence to people including diseases like cancer, stroke, heart disease, or asthma. Contaminated water causes rapid spread of water-borne disease and the toxic substances in water that kill the beneficial living organisms and destroy the biological activity. There is an increasing trend of neurological problems in Nepal.

Climate change is seriously affecting the weather patterns, which will hurt geology, geography, agriculture, and social structure. Changes in climatic factors like temperature, solar radiation and precipitation have potentials to influence crop production. The problem of frequent drought, severe floods, landslides and mixed type of effects in crops have been experienced in Nepal because of climate change. Given the country's unique natural assets, including the highest mountain range in the world, and rich heritage and cultural diversity, tourism is a potential vehicle for economic development. However, current air, water and pollution has adversely affected the tourism industry.

## **Roundtable Discussions**

Topics for roundtable discussions included:

- (1) Scope, modality and justification for the Center of Excellence (CE)
- (2) Strategies and actions of the CE
- (3) Vision, mission, goals and roadmap
- (4) Working group and its structure, collaboration, and funding

## **CENTER OF EXCELLENCE FOR ENVIRONMENT AND CLIMATE CHANGE**

### **Rationale**

Based on the recommendations from NRNA ICC's America's Regional Expert Conference held on June 16-17, 2018, in San Francisco, California, USA, and the 1<sup>st</sup> NRN Global Knowledge Convention: Expanding Nepal's Knowledge Pool through Diaspora, 12-14 October, 2018 Kathmandu, Nepal, NRNA, we hosted this workshop on Monday, December 16, 2019 in Kathmandu. The NRN's Global Knowledge Convention summarized the tasks in relation to environmental pollution as (1) Identify science-based indicators to understand the level of environmental pollution, (2) Assess the negative impact of pollution on public health, agriculture, tourism and overall national economy, (3) Find short term and long-term solutions based on well-planned policies, (4) Implement new laws, science and technology based Sustainable Environment Management System, education, awareness, participation and behavioral changer for improving environment, and (5) Develop a partnership among GoN policy makers, universities, businesses, community and NRN experts to tackle the environmental pollution issues. The convention

participants firmly believe that creation of a Center of Excellence will bring professionals and experts in this field together for net-working and knowledge sharing.

The Center of Excellence for Environment and Climate Change is urgently needed to carry on activities primarily on the following issues:

1. Air quality – biomass burning, vehicular exhausts, dusts, eg. KTM. (About 53 dead bodies cremated every day at Pashupati Arya Ghat, which causes bad smoke and the emissions of mercury and metals from human body/filled teeth.)
2. Water quality and quantity.
3. Food security and nutrition for normal and disaster periods.
4. Implementation and execution of existing law, policies, (eg. smoke emission of vehicles).
5. Livelihood issues of the common citizens.
6. Ownership (eg. waste burning – management – Municipality’s job, blame game, pointing others for blame/responsibility, not clear on the roles of different level of government units. Incentive to report/complain).
7. Coordination issue (eg. One builds the other breaks, coordination with states and federal and local governments).
8. Nexus – water, food, energy at the grassroot level. Outmigration, unemployment, land abandonment, land fallowing, dry springs, delivery mechanism, forestry and low cost carbon sequestration, climate change impacts, waste management, river clean ups and other issues need to be tied up with the water, food and energy nexus, climate change and environmental protection.
9. Knowledge gap – a lot of work is being done—but nobody knows who is doing what—civic society, governmental institutions, public, private sector and other stakeholders need to work hand in hand to address the issue of knowledge gap.

## **Vision**

Envisioning a state-of-the-art knowledge institution for building climate resilient and low carbon society with respect to livelihood, environmental quality and public health (air, water, food), the Center of Excellence for Environment and Climate Change will work collaboratively with the government, diaspora, and other stakeholders in generating and sharing knowledge and skills necessary for addressing the issues of environmental pollution, global climate change, and economic growth.

## **Mission**

The mission of the CE for Environment and Climate Change is to foster climate change adaptation, environmental sustainability, economic growth and livelihood, and sustainable natural resources development and management through the generation and sharing of necessary knowledge and skills and forging collaboration with government agencies, diaspora and other stakeholders in and outside the country.

## **Goals**

Goal 1. To foster collaboration and coordination among various governmental and non-governmental agencies for climate change adaptation, environmental quality and public health, and economic growth (to be catalyst)

Goal 2. To promote re-greening of Kathmandu valley and other urban areas in the country.

Goal 3. To serve as a platform/digital library for global climate change and environmental knowledge management and transfer.

Goal 4. To streamline and address food and nutrition related environmental issues such as food adulteration, food and nutrition safety, organic food, and food storage.

Goal 5. To build capacity for environment and climate change adaptation research and development.

Goal 6. To identify, promote, develop, and implement sustainable practices that improve environmental quality including air, water, and soil.

## **Strategies**

Goal 1: Collaboration and coordination

- Formation of a coordinating committee among key stakeholders.
- Annual seminar, conferences, workshops.
- Vigorous outreach.

Goal 2: Re-greening urban areas

- One Person One Tree Campaign (one person needs 4-5 plants for 16 kg oxygen per day).
- Green Roofs Campaign (public and private buildings).

### Goal 3: Knowledge bank

- Bridge the data gap- digital library portal – one portal for climate change and the environment.
- Knowledge mapping and update document each year covering activities and publications of all the organization active in the sector – annual literature review – synthesis – common people.

### Goal 4: Food, nutrition and environment

- Disseminating knowledge on food toxicity and food adulteration
- Organic food
- Food storage

### Goal 5: Capacity-building for climate change and environmental quality R and D

- Climate change adaption research
- Identify and discourage research duplication
- Natural disasters such as wildfires, flood, droughts
- Forest vegetation type and carbon sequestration

### Goal 6: Sustainable practices to improve environmental quality (air, water, soil)

- Environmental pollution - source, impact, solution
- Point and nonpoint source pollution

### **Modality**

Participants discussed thoroughly about the structure and the operational modality of the Center of Excellence. All participants agreed that it should be nonpolitical and nonprofit organization and it should be housed under Asta-Ja Research and Development Center (Asta-Ja RDC), Kathmandu, Nepal. It may turn into an independent Centre of Excellence in the future. The Center of Excellence will work collaboratively with KU, ICIMOD, TU, Ministry of Forest and Environment, and diaspora, and other stakeholders. Minimal cost, meaningful execution, ownership sharing, and effective inter-institutional collaboration would be the basic operational style of the Center. Asta-Ja RDC expressed keen interest on housing the Center at Asta-Ja RDC Office, creating a webpage in Asta-Ja RDC website, and overseeing auditing and other necessary daily activities of the Center. To start with, there should be at least one staff dedicated to the Center of Excellence for Environment and Climate Change.

The Center of Excellence (CE) for Environment and Climate Change will work in collaboration with Tribhuvan University, ICIMOD, Kathmandu University, and NRNA Academy. The CE will engage in understanding the impact of environmental pollution and suggest technology and policy-



based solution. It will also prepare Sustainable Environmental Management Action Plans (SEMAP) in consultation with GoN. Integrated CE with the global institutions and diaspora experts for expert knowledge. The CE will also work at the local level for education, awareness, participation and behavioral change of citizens. The CE will work closely with GoN, local authorities (municipality) and businesses to implement SEMAP. The CE will conduct regular town hall meeting, workshops, presentation at schools, community and local government.

The CE will work on creating a network of NRNA "Think Tank" in Environment and Climate Change to improve the environmental sustainability in Nepal. The CE will develop partnerships with diaspora organizations such as Asta-Ja USA and Asta-Ja ICC, and others whose missions include environment and climate change issues in Nepal. The CE will also focus on gathering research information especially on scientific models to understand current issues in Nepal and predict future environment and climate change and its effect on human health and socio-economy in short and long term. For environmental climate change education, awareness, participation and behavioral change at all level, the CE will seek “funding” from international organizations, individuals and business communities.

## **Roadmap**

1. Develop a detailed action plan for the Center of Excellence (short, medium and long-term).
2. Develop a Center of Excellence Webpage under Asta-Ja RDC website.
3. Fundraising/collaboration/stakeholders.
4. Host the 1<sup>st</sup> Annual workshop in December 2020. This workshop (December 16, 2019) is considered as the Inception Workshop.

## **WORKING GROUP**

A highly dedicated working group is formed for implementation of the workshop recommendations and the Center of Excellence for Environment and Climate Change. It includes the following individuals:

1. Dr. Durga D. Poudel, Coordinator
2. Dr. Niroj Aryal, General Secretary
3. Dr. Abdul S. Ansari, Member
4. Mr. Bhupendra Das, Member
5. Dr. Yadav Prasad Joshi, Member
6. Mr. Arun Sharma Poudel, Member
7. Mr. Ramesh Neupane, Member
8. Mrs. Nirjala Pandey, Member
9. Mr. Sahil Shrestha, Member
10. Mr. Puspa L. Moktan, Member
11. Mr. Arun Prasad Bhattarai, Member



**APPENDIX I. Workshop Pictures**





## APPENDIX II Participants

SN	Name of Participant	Organization	Designation	Contact Number	Email Address
1	Ram Prasad Gotame	Nepal GIS Society	Env. Expert	9849107279	<a href="mailto:rpgotame1990@gmail.com">rpgotame1990@gmail.com</a>
2	Subash Karki	ASCoL	Student	9861604605	<a href="mailto:iamsubashkarki@gmail.com">iamsubashkarki@gmail.com</a>
3	Kriti Khanal	ASCoL	Student	9846747201	<a href="mailto:kritikhanal6@gmail.com">kritikhanal6@gmail.com</a>
4	Abdul Sahim Ansari	Climate Change Addeption	Head of Office	9841265051	<a href="mailto:abdulsahim.ansari@gmail.com">abdulsahim.ansari@gmail.com</a>
5	Arun S. Poudyal	Kathmandu Forestry CLZ	Ass. Prof.	9843126333	<a href="mailto:arun.pould@gmail.com">arun.pould@gmail.com</a>
6	Binita Upreti	ASCoL	Student	9861187902	<a href="mailto:upretibinita797@gmail.com">upretibinita797@gmail.com</a>
7	Usha Bajgain	ASCoL	Student	9846776603	<a href="mailto:ushabajgain3@gmail.com">ushabajgain3@gmail.com</a>
8	Dr. Niroj Aryal	NC A&T Usa	Faculty	3369884477	<a href="mailto:nepalguras@gmail.com">nepalguras@gmail.com</a>
9	Dr. Durga D Poudel	University of Louisiana at Lafayette, USA	Professor		<a href="mailto:ddpoudel@gmail.com">ddpoudel@gmail.com</a>
10	Bishnu Dayal singh	Asta Ja RDC			
11	Harish Bhushal				
12	Nirmala Pandey	Helen keller Int.	Tech Expert AG/Cc	9841451845	<a href="mailto:nirpandey@gmail.com">nirpandey@gmail.com</a>
13	Dr. Bishnu P chapagain				<a href="mailto:bishnu.bgu@gmail.com">bishnu.bgu@gmail.com</a>
14	Dr. Yadav Pd Joshi	MMINS	Env Health	9851121372	<a href="mailto:yadavjoshi@gmail.com">yadavjoshi@gmail.com</a>
15	Shail Shrestha	Digo Bikas	Program Director	9852056491	<a href="mailto:shailshrestha@DIGOBIKAS.ORG">shailshrestha@DIGOBIKAS.ORG</a>
16	Dr. Bishwo Keshar Maskey			9851033466	<a href="mailto:bishwokmaske@gmail.com">bishwokmaske@gmail.com</a>
17	Madhav Adhikari	Asta Ja RDC	Member	9851016840	
18	Dr. Udhav Raj Khadka	Asta Ja RDC			
19	Aman Prasad Bhattarai	The Small Earth Nepal	Program Coordinator	9851155371	<a href="mailto:aman@smallearth.org.np">aman@smallearth.org.np</a>
20	Dr. Peetambar Dahal				
21	Bhupendra Das	TU CDES	PHD Scholar	9840090897	<a href="mailto:bhupenids@gmail.com">bhupenids@gmail.com</a>
22	Ramesh Neupane			9843199202	<a href="mailto:mail.ramyas@gmail.com">mail.ramyas@gmail.com</a>
23	Dr Indira Parajuli	TU CDES	Faculty	9801033588	<a href="mailto:parajuli_indra2000@yahoo.com">parajuli_indra2000@yahoo.com</a>
24	Pushpa lal Moktan				
25	RC Gauli			9824149263	
26	Dr. Shanti Kala Subedi	Himalayan CLZ	Head of Office	9865554967	<a href="mailto:sksubedi3@hotmail.com">sksubedi3@hotmail.com</a>
27	Bimala Dumar	CDOS	Student	9843803719	<a href="mailto:bimaladumari01@gmail.com">bimaladumari01@gmail.com</a>
28	Prakriti Basi	CDOS	Student	9849127238	<a href="mailto:prakriti.basi@gmail.com">prakriti.basi@gmail.com</a>
29	Roshan Dhakal	Hicast	Student	9841370524	<a href="mailto:iamroshandhakal@gmail.com">iamroshandhakal@gmail.com</a>
30	Aditya Dhungana	Hicast	Student	9841411474	<a href="mailto:dhaditya8@gmail.com">dhaditya8@gmail.com</a>
31	Rasmila Maharjan	naf seedS		9841458588	<a href="mailto:NAFSEEDS@GMAIL.COM">NAFSEEDS@GMAIL.COM</a>
32	Dr. Pramod Dhakal	NARA Academy	Chair	9851133440	<a href="mailto:pdhakal@gmail.com">pdhakal@gmail.com</a>

## **APPENDIX III Workshop Program Schedule**

### **CENTER OF EXCELLENCE FOR ENVIRONMENT AND CLIMATE CHANGE WORKSHOP**

MONDAY, DECEMBER 16, 2019, 8:30 AM – 4:00 PM

UNIVERSAL CAFÉ, SUKEDHARA, KATHMANDU, NEPAL

#### **Program Schedule**

8:30 AM – 9:30 AM	Registration and Coffee/Tea Biscuits
9:30 AM – 9:50 AM	Opening Remarks Dr. Bishwa Keshar Maskey Mr. Pushpa L. Moktan, President, Asta-Ja RDC, Nepal
9:50 AM – 10:20 AM	Introduction and the goals and objectives of the workshop Dr. Durga D. Poudel, Environmental Science Program, School of Geosciences, University of Louisiana at Lafayette, Louisiana, USA

#### **General Session**

10:20 AM – 10:40 AM	Environmental Pollution and Public Health Dr. Shanti Kala Subedi, Chief, Research & Innovation Unit, Himalaya College of Engineering, Lalitpur
10:40 AM – 11:00 AM	Climate Change Issues and Concerns Dr. Udhav Raj Khadka Central Department of Environmental Science, Tribhuvan University
11:00 AM – 11:10 AM	Tea Break

11:10 PM – 1:00 PM

#### **Roundtables**

- (1) Scope, modality and justification for the CE
- (2) Strategies and actions of the CE
- (3) Vision, mission, goals and roadmap
- (4) Working group and its structure, collaboration, and funding

**1:00 PM – 2:00 PM**

**LUNCH**

**2:00 PM – 4:00 PM**

**Synthesis**

**4:00 PM**

**Thank you notes and adjourn**