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Editor-in-Chief

Sushma Bajracharya

Publication Committee

Prof. Dr.- Ing. Ramesh Kumar Maskey
Er. Sandhya Regmi
Er. Jeetendra K. Gurung
Ms. Sabina Khatri
Ar. Rupesh Shrestha
Er. Abhinab Kadel

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लुम्बिनी बौद्ध विश्वविद्यालय
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Message from Vice Chancellor Lumbini Buddhist University

It is a matter of great delight to note that Nepal German Academic Association (NEGAAS) is publishing NEGAAS Journal 2019 to be released on the Occasion of its 31st AGM in Kathmandu, commemorating 60 years of Nepal German Diplomatic Relations. Congratulation to NEGAAS for such a very important publication and addition of an innovative ingredient to celebrating the 60th year of friendship between Nepal and Germany; two unique countries, both renowned but differently – Germany for technology and Nepal for Himalayan simplicity and valor.



We are in a very interesting era of world development where science and technology has propelled human potential to a level where the boundaries of existential realities and imaginations are fast fading. Much of the credits go to Germany. The influence of science and technology on human life as well as other forms of lives has however compelled the World to raise a very crucial question regarding the very existence and meaning of life, Nature, and the planet Earth. United Nations has started Global Campaign for saving earth and opting for sustainable development. This is where Nepal has potential to contribute with the Darshan and teachings of Shakyamuni Buddha: always to remain balanced – treading on the middle path, being mindful of not only the externalities but also taking internal voyages for searching peace, harmony, and shared responsibility of well being and prosperity for all. The triple gems of Buddha's teachings - Knowledge (Buddha), Ethics (Dharma), and the practicing Society (Sangha) always orient us towards higher level of human existence. I think NEGAAS is better placed to take leading role for such balanced development.

It is a matter of great satisfaction to note that graduates and trainees from Germany's universities and institutes have been dedicatedly engaged in taking Nepal towards the path of prosperity while keeping the academic height and bonding relationship with their Alma-Mater. The present Journal is a testimony of the dedication of NEGAAS members. I appreciate the effort of the Chief-Editor Ms. Sushma Bajracharya and NEGAAS team in bringing out this issue of the Journal, which touches, among others, on matters related Buddhist values and teachings. Further in this line I would like to invite NEGAAS to interact and collaborate with Lumbini Buddhist University (LBU) in fostering the matters of mutual academic interest.

Anchored on the application of Buddhist core values to promote the World Peace, LBU—founded under the LBU Act 2006 and located at the birthplace of Gautam Buddha, Lumbini is an autonomous, multi-disciplinary, public institution of global reach on higher learning devoted to excellence in teaching, learning, and research, and to developing leaders that help bring prosperity in the world, founded on the World Peace.

I hope for ever stronger Nepal-Germany friendship, and wish all the best for NEGASS in its future endeavors.

Bhavatu Sabba Mangalam.


Prof. Pradyumn Ratna Bajracharya
Vice Chancellor

Message from Ambassador of Germany

Dear Members of NEGAAS,

Dear German Alumni,

Dear readers,

A lot has happened since the last journal was published in December 2017. When I started my Ambassadorship in Nepal in September 2017, I witnessed a fascinating election process in November and December of the same year. Democratically elected governments at provincial and federal level formed at the beginning of 2018. Nepal's move into federalism got into full swing and the dialogue on transitional justice continued.



In 2018 we launched our big anniversary year, celebrating 60 years of diplomatic relations between Germany and Nepal. In 2019 we received a Parliamentarian delegation from Germany and the Asia Director of the German Federal Foreign Ministry, Mr. Markus Potzel. During the visit of Mr. Potzel our governments signed a Memorandum of Understanding for bilateral political consultations.

On the occasion of the visit together with our European partners we are recognizing the fast development that is happening in this country. Even though damage from the big earthquake in 2015 is still visible in certain places, recent progress towards political stability and economic prosperity is promising. One of the priorities of the German Embassy is to promote Nepal as a valuable market for foreign investment from Germany and the European Union. But this is not just about investment; it is also about knowledge sharing and innovation.

A very important link between our two countries are the German Alumni. Many of you have studied in Germany or done research at one of our 400 universities. After your return to Nepal you have continued your career either in an academic or economic field. Nepal has a huge potential to develop and prosper given its young population. With your expertise and experience you can play a key role for further strengthening the ties between Germany and Nepal. The creation of NEGAAS has provided structure to the efforts of German Alumni and can serve as a platform to intensify the impact you are having in both countries. The collaboration between the German embassy and NEGAAS and its members is very fruitful. NEGAAS speaker's programmes at Goethe Zentrum Kathmandu, the "Germany Day" at Tribhuvan University that informed young people about study and scholarship opportunities in Nepal and NEGAAS' first talk event in May 2019 with high ranking political representatives are bright examples. Together, lets further grow the Alumni network and utilize it.

Yours Sincerely

Roland Schäfer

Message from the President and Vice-President



It gives us immense pleasure to realize the publication of NEGAAS Journal 2019 on the eve of NEGAAS's 31st Anniversary.

In NEGAAS's 30 years' history, building on the foundation laid by our predecessor executive committees, the current committee has sought to raise the institute to newer heights and dimensions. Towards that end, we highly appreciate NEGAAS members for their active participation in various events, and for helping the institute realize its set targets.

In collaboration with DAAD and the Embassy of the Federal Republic of Germany, we have proactively participated in celebrating 60 years' diplomatic relationship between Nepal and Germany with workshops, seminars and talk programs. We have signed MOU with Goethe Zentrum Kathmandu (GZK) with the objective of promoting academic exchange and enhancing cultural ties between the two countries. Under the leadership of the current Executive Committee, we have achieved our set target and raised NEGAAS's membership to 100. Publication of this Journal marks another crucial milestone in fostering academic exchange amongst researchers, scholars, practitioners and students.

We take this opportunity to thank the Vice-Chancellor of LBU Professor Hridaya Ratna Bajracharya for his inspirational and spiritually enlightening message. We are grateful to the German Ambassador and Honorary Member of NEGAAS H.E. Roland Schäfer for the ongoing collaboration, strong support and his Goodwill message. Our sincere appreciation and heartfelt thanks go to the Editor-in-Chief of the Journal Ms. Sushma Bajracharya for her coordination, diligence and dedication.

Finally, we thank our NEGAAS family for supporting the Executive Committee in realizing the institute's vision, principles and values.

Prof. Dr.- Ing. Ramesh K. Maskey
President, NEGAAS

Er. Sandhya Regmi
Vice President, NEGAAS

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EDITORIAL

NEGAAS is Pleased to launch another issue of its journal after two years. It is a matter of great honour to be the Editor-in-Chief of this edition of the journal. NEGAAS is an academic alumni association of the Nepalese, who have attended their higher studies and trainings in various esteemed universities and institutes in the Federal Republic of Germany.



We take pride in witnessing diverse fields in which the NEGAAS members are contributing towards well-being of the nation. We all are contributing in various fields of our expertise, including renewable energy, conservation of water and other natural resources, management, community development, infrastructure development, science and technology, peace building and conflict transformation. Some of us are even involved in the field of spirituality. The blend of the articles contained in the journal reflects a very good picture of diverse fields of engagement of NEGAAS members.

This year we are celebrating 60 years of precious friendship between Nepal and Germany. Talking about the Nepal-German relationship, it is not only about the precious friendship between the two nations; but also is about the friendship of the individuals who have bonded during their stay in Germany. We really enjoy great friendship that is built on some wonderful values like unconditional love and giving. Germany is one of the major development partners of Nepal. German Government provides technical as well as financial assistance in various fields for Nepal's prosperity and sustainable development. We are fortunate to have enjoyed scholarships to pursue higher studies in Germany and experienced unconditional contribution from the German Government. As an acknowledgement, we trust in giving back to our societies in different ways through our engagement.

Many German friends share that they receive immense happiness meeting Nepali people, whom they consider are the only folk they know of, who smiles even in difficult times. Agreed, we love to laugh, and this is one thing, which our German friends treasure very much. Therefore, I strongly believe that feelings of happiness and cheerfulness are related to spiritualism, which we share in return to our German friends. This is perhaps the "True Friendship", which we shall cherish and celebrate for many more years to come.

It has been a wonderful experience working towards this journal. It was a team work and I would like to thank all the people, who were involved in one or the other way in the process. My special thanks go to H.E. Mr. Roland Schaefer, German Ambassador to Nepal for his encouraging Goodwill message. I would also like to thank Prof. Dr. Hridaya Ratna Bajracharya, the Vice Chancellor of the Lumbini Buddhist University for his very succinct and apt Goodwill message. Further, I would like to extend cordial thanks to DAAD for their generosity in funding the printing costs of this journal. Last but not the least, I would like to thank all the authors for their valuable contribution and sponsors, without whose generous support, this journal would not have possible.

I hope that we will be able to spread peace and happiness in many societies in Nepal.

Thank you

A handwritten signature in cursive script, appearing to read 'Sushma'.

Sushma Bajracharya

Editor in Chief

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Buddhism For Happy Family Life



- Sushma Bajracharya

Background

Every living being strives for happiness and no one wants to be unhappy. From the time immemorial, people have been searching for happiness. Spiritual leaders from various faith systems have preached different methods for attaining happiness. People today are spending huge amounts of money for happiness and well being. World leaders have realized today, that a nation's performance in terms of development cannot be judged only through economic aspects. It requires to be assessed beyond economics. This is why the concept of of General Well Being was adapted. The concept says that well-being cannot be measured by money or traded in markets. It includes beauty of our surroundings, the quality of our culture and strength of our relationships.

Since 2013, United Nations has been producing World Happiness Reports (WHR) every year and it has declared March 20 as the International Day of Happiness, in recognition to the importance of happiness. WHR ranks 156 member states of the United Nations in terms of their gross national happiness. Nepal is ranked 101 in that list and among the SAARC countries; Nepal is the third happiest country after Pakistan and Bhutan.

Happy country is essentially crafted by the happy Families, which are the prerequisite for the happy societies. As an old proverb says, "Charity starts at home", so does happiness. Family is constructed by individual family members. Thus in order to make a family happy, its members must be happy. Happy people are those, who are skilled to transform unfavorable conditions into favourable conditions. In other words, happy are those people, who are skilled to transform suffering into happiness. This is exactly the TEACHING of the Buddha: Liberation from Suffering.

Happiness Defined:

United Nations defines Happiness as a mental or emotional state of well-being characterized by positive or pleasant emotions ranging from contentment to intense joy.

Miriam Webster Dictionary defines Happiness as, a) a state of well-being and contentment or joy; b) a pleasurable or satisfying experience.

Oxford Learner's Dictionary defines Happiness as the feeling you have when things give you pleasure and can be quite a lively feeling.

Buddha had taught that the Happiness (Piti) is one of the seven factors of enlightenment (Satta Sambojjhanga) and it is essentially a quality of mind. This is a skill that can be mastered through proper practice.

Buddhism for happy family life

For 45 years the Buddha gave teachings on how to get liberation from Suffering with a goal towards state of lasting, unconditional happiness known as enlightenment. Buddhism is therefore a realm that teaches happiness. As Lama Ole Nydahl mentions in "Buddha and Love", "From a Buddhist perspective, happiness and joy do not depend on outer conditions, which change constantly, but on the experiences of all phenomena — mind itself."

Imagine a road with five drivers driving from different directions and all of them suddenly lose control of their cars. What happens on the road? It causes a sheer chaotic situation. As they have no control over the cars, they would be driving haphazardly and they will shout at each other and for that moment their lives will become like "hell" and rather dangerous not only for them, but also for all the others driving or walking on that road.

Similarly, imagine a family of five or more family members, who have no control over their own minds. All of them do what their minds dictate, without giving any due consideration to others in the family. They would shout at each other, hurt each other, and disrespect each other and so on. What kind of family would that be? Each one would hurt other's ego and that would certainly not be a happy family. The way out from such a situation would be that the family members learn to tame their mind; cultivate their moral conduct in such a way that they act very assertively towards each other, without causing any hurt or pain to each other. This is exactly what the Buddha taught.

As we all know, Buddha's teaching is all about training our mind through proper practices in such a way that it becomes able to realize the truth and leads us towards peace and happiness. The practice is about adhering to the precepts and the Vipassana Meditation. Many researches have shown that people practicing those two are happier people. If everyone in the family learns this art of living, then all the family members will certainly be happier and will lead happy family lives.

As the first two verses of the Dhammapada mention:

Mind precedes all mental states, mind is their chief; they are all mind-wrought. If with an impure mind, a person speaks or acts, suffering follows him like the wheel that follows the foot of the ox.

Mind precedes all mental states, mind is their chief; they are all mind-wrought. If with a pure mind, a person speaks or acts, happiness follows him like his never departing shadow.

Therefore, the most important thing is to cultivate still mind, which is pure and the pure mind will always leads towards happiness like never departing shadow.

Another piece of Buddha's teaching, which is very important for happy living, is the "Practice of the Brahmavihara (the four immeasurable. They are: Metta (loving kindness), Karuna (compassion), Upekkha (equanimity) and

Muddita (appreciative joy). If one is able to practice these four qualities, the person will always be happy and will lead others towards happiness. If these four aspects are practiced with each other in the family, that family will certainly be like heaven.

Sigalovada Sutta of the Deegha Nikay is another very important teaching by the Lord Buddha for the lay people. In this Sutta, the Buddha teaches about the duty and responsibility of each family member towards the other member. This Sutta even teaches on responsibilities and duties of friends, teachers and pupils, employers and the employees. Thus this teaching is not only meant for happy families, but for the happy societies, communities and the nation as a whole in general.

Conclusion

The ultimate goal of Buddhist teaching is to attain Nibbana through practice of Precepts (Sila), Concentration (Samadhi) and wisdom/knowledge (Pragya). It is all about improving one's behavior, attitude and character. A true practitioner of Buddhism will make all the efforts not to do any harm, not only to human beings, but also to all the living beings and the environment. If everyone follows the way of living as taught by the Buddha, happiness will be guaranteed.

Jataka stories of Pali Canon mention that the Gautama Buddha lived during the Eon of Dipankara Buddha as the Hermit Sumedha, who could have attained Arhathood during that time. But he opted to go for tedious path of Buddha-hood for the benefit of all beings. This shows that from the very beginning as the Hermit Sumedha; then for many more lifetimes as mentioned in the Jataka stories and ultimately as the Gautama Buddha; even just before Mahaparinibbana, the central theme of the Buddha's teachings has been ultimate happiness.

BBC News on 21st May 2003 (<http://news.bbc.co.uk/2/hi/health/3047291.stm>) published an article called "Buddhists really are happier". The article mentioned that based on the tests carried out at the California San Francisco Medical Centre, United States, reveal that areas of their brain associated with good mood and positive feelings are more active. It also quoted Paul Ekman, University of California San Francisco Medical Center as saying "There is something about conscientious practice that results in the kind of happiness we all seek".

Here is an extract from the the most revered Vipassyana Teacher S.N. Goenkaji's book, "Was the Buddha a Pessimist?":

If one practices only sila (morality), the starting point of this pure path of Dhamma, one becomes happy in this life and gets divine happiness after death. If one practices samadhi (concentration of mind), the middle part of Dhamma, one enjoys the bliss of absorption and after death gets brahmic happiness. And if one gets rid of all the kammās (conditionings) through the practice of pañña (penetrating wisdom)—the final part of the Path—then one experiences the infinite happiness of nibbana and after death attains the eternal, steadfast and deathless state.

On July 9, 2018, there was an online article on Vox.com by Eliza Barclay about the 12 Thai boys, who were trapped in a cave, which was titled "How Buddhist Meditation kept the Thai boys calm in the cave." The article mentions, "when the 12 boys who've been trapped in a cave and are being rescued one by one were first

discovered by British Divers a week ago, they were reportedly meditating". According to the article, the coach of the boys had spent 10 years as a Buddhist monk in a monastery and he practiced meditation with the boys, who were 11 to 16 years old to keep them calm and preserve their energy through their two week-ordeal. Based on the Meta analysis by John Hopkins researchers in 2014, article further mentioned, "Recently scientific researchers have shown in clinical setting that mindfulness meditation (a specific meditation practice and one that is taught in Thai Buddhism and elsewhere around the world) can reduce anxiety and depression as well as pain." Reduction of anxiety, depression and pain, which leads towards calmness and peace, will certainly have a positive influence on happiness.

Thus Buddhism as such is a realm that teaches happiness in this life and beyond; happiness not only for the human beings, but for all beings. Therefore a vigilant practice of Buddhist teaching guarantees happy family life.

May All Beings be Happy !!!

Author's Introduction

Sushma Shrestha Bajracharya is an agricultural Engineer, with profound experiences in Peace Building and Conflict Transformation. She has experiences in working in Nepal, Sri Lanka, East Timor and Bangladesh in the field of Food Security and Peace Building. After working for almost 30 years with German Development Cooperation, she is currently working as a free lancer. Major focus of her work has been Peace Building, Social Transformation, Civil Society Development, Gender and Social Inclusion.

During the course of her tenure in various capacities in different countries, she has conducted large number of training on leadership development, training of trainers, dialogue and mediation, peace building and conflict transformation, gender and social inclusion. She has experiences of conducting training not only in Nepal, but also in countries like Bangladesh, Sri Lanka and East Timor. She has participated in various fact finding, appraisal and evaluation missions in many countries including China, Laos and Cambodia.

Recipient of three gold medals (Aishwhrya Vidhya Padak, Tika Laxmi Padak and the Nepal Vidhya Bhushan) she has second masters in Theravada Buddhism and currently enrolled for PhD in Buddhism.

Application of Buddhist Teachings in Promoting Lumbini—Origin of Buddhism and Epicenter of World Peace



- Er. Sandhya Regmi

ABSTRACT:

The paper highlights the potentials and approaches in promoting the Buddha's birthplace Lumbini as an origin of Buddhism and epicenter of the world peace. The paper reviews Lumbini's historical facts and current situations, and highlights the overarching importance of promoting Lumbini's birthplace. The paper takes deep dive into the Buddhist teachings, principles, and ethical codes, and demonstrates how the holistic approach—integrating the spiritual/Buddhist approach with the materialistic/legalistic approach—could help human beings comprehensively resolve the world problems.

KEYWORDS : Lumbini, Buddha, Buddhism, World Peace, Materialistic/Legalistic Approach, Spiritual/Buddhist Approach, Buddhist Teachings

1. INTRODUCTION:

In the sacred birthplace of Siddhartha Gautama—after the long-lost Lumbini got inscribed on UNESCO's list of World Heritage in 1997—a series of international events have been taking place over the past one-and-half decade. The first international Buddhist conference entitled 'Lumbini in the New Millenium' was organized by the government of Nepal in 2001. Then the World Buddhist Summit was organized in 2004, by the government and Lumbini Development Trust under the theme of 'Lumbini: A Symbol of Unity in Diversity – the Fountain of World Peace'. In 2014, Lumbini hosted the third International Buddhist Conference on 'Promotion, Protection & Preservation of Buddhist Culture & Heritage' [1]. Similarly, the fourth International Buddhist Conference with the central theme: 'Lumbini as the Birthplace of Buddha, the Fountain of Buddhism and World Peace' took place in Kathmandu followed by the 2560th Buddha Jayanti celebration in Lumbini on 19-20 May, 2016.

With its universal appeal and timeless value no other venue may stand for such events compared to the historical garden of Lumbini. It is the heart not only of all the Buddhists but also of every peace-lover across the world. And such events enhance the image of Lumbini—the glorious heritage of Nepal, the fountain of peace, and the world's top rated pilgrimage site. The UN Secretary-General U Thant had stated in 1977 that

his visit to Lumbini was one of the most important days of his life [2]. In March 1989 Javier Perez de Cuellar had stated during his visit to Lumbini—*“Worldwide attention is focused on Lumbini not only because pilgrims and tourist come from all over the world, but because for all mankind Lumbini has special meaning as a place of meditation and spiritual renewal, a center of culture exchange and a symbol of peace.”*[3] Similarly, Kofi Annan had sent his message to the first World Buddhist Summit in Lumbini in 1998, which read—*“As the most sacred place of pilgrimage for the world’s Buddhists, Lumbini provides yet another illustration of the inter-connectedness of all people, across borders and across time, and reminds us how much the world’s religions can teach us, Buddhists and non-Buddhists, believers and non-believers alike.”*[4]

The author had had the privilege to join the International Buddhist Conferences in Lumbini, where venerable monks and respectable nuns from over 32 countries across the world had been the lime lights. Besides, professors, educationist, cultural experts, UNESCO-affiliated archaeologists, UNEP-affiliated climate experts, research scientists, dignitaries, government-level delegations from over 28 states, educational institutions, Buddhist scholars, devotees and enthusiasts were the participants. The events ran through a series of intellectual sessions on Buddhist Heritage, Culture, Educational System, and Environmental Conservation & Sustainable Development of Lumbini.

The conferences were special in many ways. Based on the archaeological evidences, and historical facts, and relying on the scientific principles, the event of May 19, 2016 reaffirmed Lumbini as the birthplace of Buddha, and origin of Buddhism and the fountain of world peace.

Presenting his research paper 'New Archaeological Discoveries in Nepal's Natal Landscape of the Buddha', Professor Robin Coningham of Durham University concluded based on the historical facts and their calibration with other contemporary archaeological evidence that Buddha was born in Lumbini. He revealed that in 1896 General Khadka Shamsher and Dr. Anton Fuhrer had uncovered in Rumindei in the Terai a stone pillar with an inscription carved in early Brahmi script that read: *“Beloved of the Gods, King Piyadasi (Ashoka) when 20 years consecrated came to worship saying here the Buddha Sakyamuni was born.”*[5] Another research paper on the birthplace confirmation was presented by Dr. Pra Anil Shakya—venerable monk 'Sungandha' of Mahamakut Buddhist University. In establishing the case, he highlighted the fact that the inscription engraved on the Lumbini pillar in 5 lines consists of 93 Brahmi characters, which includes:—*“HidabhagavamjatetiLumminigame”*:—*“Lumbini was the village where the Buddha was born.”*[6]

The participants converged on the point of oneness of Buddha and Buddhism, and considered Lumbini to be the epicenter of world peace. The conference concluded in Lumbini on 21st May, 2016 with a 10-point Declaration, endorsing a plan to promote Lumbini as the centre of Buddhist faith [7].

2. TASKS AHEAD:

The greatest challenge ahead is the effective and efficient implementation of the Lumbini Declaration. At its core lies the issue of how to achieve the timely implementation of Lumbini World Peace City Master Plan. While the funding sources and investment modalities are expected to play critical role in shaping the process, importance of the following matters should not be underestimated.

2.1. Preserving Lumbini's Environment

First and foremost, Lumbini should be free from environmental hazards. The main threat comes from the proliferating carbon emitting factories—particularly, cement, brick and steel industries—in the periphery. Environment Impact Assessment conducted by the IUCN in 2013 confirmed the estimated release of about 912.6 metric tonnes of carbon emission per day [8]. The emissions are putting both the social and the natural environmental health under serious threat of degradation in general, historically important temples and monasteries including the Mayadevi Temple and the 2,000-year-old Ashoka Pillar [9]. The emitted carbon is carcinogenic to humans, and is declared by WHO as a leading cause for cancer-based deaths [10].

A comprehensive air quality assessment conducted at the Lumbini World Heritage Site and its vicinity by the WHO in 2013 showed that the PM_{2.5} touch unhealthy level of 270 µg/m³ which is 11 times higher than the WHO permissible level of 25µg/m³ [11]. Based on recent data, Lumbini is polluted than Kathmandu by more than one and a half times, according to the Department of Environment. The Ratnapark-based air quality monitoring station recorded 109.08 µg/m³ of PM 2.5 on January 3, 2017, whereas Lumbini recorded the highest PM 2.5 of 173.03 on January 14, 2017 [12]. Lumbini broke the record becoming the most polluted place in the Nepal with Ratnapark of Kathmandu being in the second line. PM_{2.5} are particulate matter suspended in air that are smaller than 2.5 micron, which are small enough to penetrate deep into the lung, consequently impair lung function, and even penetrate the blood [13]. The noise pollution too exceeds the standard of 50 dB and 40 dB at day and night-time respectively. The rate of deforestation and solid waste is ever increasing in Lumbini. Pollution of its water sources with industrial effluents is another issue.

As an Environmental Engineer, the author is convinced that these conditions have posed serious hazards on health human, threats to biodiversity, and to the ancient monuments of Lumbini. Immediate and stringent legal actions should be thus taken by government, concerned ministries and Lumbini Development Trust to exclude all carbon-emitting industries established within the Lumbini Protected Zone—which is the region covering a 15 km aerial distance from the Lumbini Project Area. Furthermore, less polluting technologies, such as solar PV and electric vehicles should be promoted in the heritage site.

Further, the author argues that despite the technological, economical and legislative intervention and advancement, the environment continues to degrade indicating that a very important aspect is missing for a holistic approach that leads towards environmental preservation and sustainable development for healthier, happier, more prosperous and peaceful communities and nation, and from the Buddhist perspective, that aspect is the **MORAL/ETHICAL** aspect.

Hence the author is convinced that the 'Materialistic Approach', comprising of the technological, economical and legal interventions, is neither sufficient nor effective in addressing these environmental threats which are putting Lumbini under severe threat of degradation. The promotion of Lumbini—origin of Buddhism, epicenter of world peace, and its cultural heritage cannot be realized without the introduction of a new approach, and that new approach is the 'Spiritual Approach'—through **BUDDHIST PHILOSOPHICAL TEACHINGS, its ETHICS and MORAL CODES**.

Many Buddhist leaders are calling to invoke our spiritualism to solve environmental problems. The most internationally visible leaders of Buddhist environmental campaign Dalai Lama and Thich Nhat Hanh have emphasized and suggested that Buddhism should become an effective force by adjusting the traditional Buddhist moral and spiritualism to address exploitations, conflicts and environmental degradation. According to Dalai Lama, the decision to save the environment must ultimately come from the human heart because *"Conservation is not merely a question of morality, but a question of our own survival."*[14] In his best-seller book 'The world we have' the Zen Master Thich Nhat Hanh writes— *"The situation the Earth is in today has been created by unmindful production and unmindful consumption."*[15] According to the Cambodian Buddhist Monk Maha Ghosananda the nature will be good to us if we respect the environment.

Buddhism and Buddhist Scriptures for Lessons on Environmental Preservation

The application of the teachings of Buddhist Scriptures—on environmental education and ethics can help profoundly in restoring and preserving environment in Lumbini.

The **Vinayapitaka** and **Suttapitaka** are rich and illuminant on Buddha's teachings on environmental education and ethics. The Cullavagga-pāli of Vinayapitaka teaches us the concept of **Recycling and Waste Management**, as narrated by AnandaThero, the disciple of Buddha, to the Athena King of Magadh about how the old robes get replaced by new ones in the community:

"The new robes are given to monks who have decayed robes. The decayed robes are used as bed-sheets after that they have been used for pillowcases; the old pillowcases are used for carpets; then those old pillowcases are used for doormats. The old doormats are used for dusters. At last, when they are about to decay totally, they are used to construct a well after they have mixed them with mud."[16]

The **Aṅguttaranikāyo** offers teachings on **Natural Resource Management** that economic resources should be used in an ethical way with virtuous leadership [17]. The **Sigalovadasutta** teaches that man must consume the natural resources without offending them just as a bee collects nectar from flowers without hurting them [18]. *"Whoever would throw or cause to throw urine, excreta, refuse and food remaining in greening grass or any clean environment is committing a forfeiture offence."*[19]

Buddhist teachings are rich also in the **Protection of Flora, Fauna and Ecology**. In sharp contrast to consumerism, individualism and materialism, Buddhism advocates that human beings are incomplete in themselves; they are fragmented, deeply interrelated to flora, fauna and ecological system. The **First Percept of Buddhism – Non-killing (Ahimsa)** from environmental perspective is non-hunting and preserving wildlife— is for the well-being of all, **ensuring Biodiversity**.

In Buddhism, it is inviolable responsibility to save the life of animals and birds. Lord Buddha saved animals from death and he explained by spreading loving kindness towards others human could save himself from the harms done by others [20]. Respecting one's life is an accepted social ethic. The involvement of the ruler and the administration are necessary to preserve the environment. The virtuousness or the bad qualities of the ruler influence on the existence of animals and the whole system of environment as depicted in **Veludvāreyya Sutta** [21].

All the decisive events in the Buddha's life occurred in natural settings—Buddha was born, attained enlightenment, and died under trees. Buddhism motivates us to protect trees and guides us to **live in Harmony with the Nature**. Defining **Dhamma** as nature and its law, the Buddhist doctrine spells out as follows:

The one, who lives according to the Dhamma, is protected by the Dhamma.[22]

The destruction of tree means the destruction of man himself.[23]

Growing trees is a valuable social activity which gains merit.[24]

The environment with trees nourishes the spirituality of man.[25]

Buddhism also teaches **Preservation of Sources of Water**. In Buddhism, all the sources of water— rivers, lakes, oceans, waterfalls and even rainfall are equal stakeholders to the ecology as the living things— and have the right of survival. Hence protecting the purity of water is the basic duty of mankind. Human settlements should not be built near the water sources so as to spare water from contamination [26]. One should not put human waste or spit into water [27].

It is stated in the **Aṅguttaranikāyo** that water makes the interconnection with human life, hence water should be used only in necessary amount without any overuse [28]. Lord Buddha taught that even a farmer who depends on agriculture for his existence, should provide water to his paddy field only when necessary [29].

The Teaching on Silence in Buddhism can be an effective tool for **Control of Noise Pollution**. Lord Buddha and his disciples chose solitude and silent places for their abode as well as meditation places where no human activity disturbed them as silence heightens their efficiency for meditation. Noise Pollution is considered not only a thorn but also a disturbance in Buddhism as it disturbs the meditation.

All these Buddhist teachings have the potential in solving the environmental problems of Lumbini in various aspects through a number of mitigation and preventive measures—cutting carbon emissions, carefully regulating the exploitation of natural resources, protecting flora, fauna and ecology and living in harmony with nature so as to prevent the environmental degradation to sustain the ecosystem and preserve the environment.

In his 1989 Nobel Peace Prize acceptance speech lecture, HH Dalai Lama had expressed his aspiration that in future the Tibetan plateau would become a zone of non-violence transforming Tibet into the world's largest national park [30]. Similar to the opinion of Dalai Lama, the author of this paper argues that Lumbini and its surroundings can be transformed into an international ecological reserve. To start with, Lumbini could jump on a campaign of going carbon neutral by planting trees just as the ongoing green campaign in Thailand, Bhutan and Tibet. As trees absorb the carbon emission, this could be a tremendous step forward for the reduction of carbon dioxide, and the consequently related air pollution hazards in Lumbini.

The natural reserves established around monasteries in Lumbini could be developed as safe haven, thus promoting international tourism and attracting people all around the world to Lumbini as one of the topmost pilgrimage sites of the world.

2.2. Globalizing Buddhist Teachings and Education System

Buddhism's another unique attribute to the society is education. In fact, the heart of Buddhism is education, and Buddha is synonym to Teacher.

Buddhism is an amalgamation of science and spirituality. In this respect, the famous saying by the greatest scientist of our modern history Albert Einstein—*"If there is any religion that would cope with the modern scientific need of the human civilization, it would be Buddhism"* gives insight that this complementary relationship between science and Buddhism can find solutions to the increasing complex challenges of our modern civilization and can contribute for the enhancement of a more holistic development leading to sustainability.

The author argues that Buddhist teachings go beyond formal educations in universities and institutions—where one earns degrees merely for bread-and-butter and for comfortable and luxurious physical life. In contrast, the Buddhist teachings have their own philosophy of holistic education that help understand the whole process of life through the 'inner-intelligence'. They cleanse our toxically-polluted mind and are solutions to ever-increasing human sufferings. Today's overly materialistic world has only pushed the world towards darkness in life. A large section of our society has gone void of moral principles. Human sufferings including stress, depression, suicide and other extremities are only growing. A day does not unfold without tragic incidents of women abuse, child abuse, human trafficking, drug addiction, and murder. Terrorism is growing in all forms and manifestations.

The teachings of Buddha focus on eliminating the darkness within oneself, and bond one's morality and conduct with meditation, and wisdom. It is directed towards developing in us the seed of spiritual nobility and fostering true humanity into life. Buddhist teachings can play instrumental role in awakening us and in developing in each of us self-awareness, wisdom, and compassion to our fellow beings without excluding the tiniest living entity of our environment.

The teachings include, among others—the core of Buddhism— **The Four Noble Truth**, out of which the first truth revolves on *'Life is suffering (dukkha)'*. The second truth reveals *'There is origin or arising (samudaya) of suffering.'* The third truth enlightens:—*'There is cessation (nirodha) of creating suffering.'* The ultimate goal of Buddhism is to lessen and eliminate the pains and sufferings from all living entities of the planet, as the fourth of the four noble truth states:—*'There is a path (marg) out of these sufferings'*[31], and the cessation of suffering is possible through **The Noble Eightfold Path** or the so-called **Middle Path**—grouped in 3 divisions—(i) **Wisdom (Right Understanding and Right Decision)** (ii) **Virtue (Right Speech, Right Action and Right Livelihood), and (iii) Concentration (Right Effort, Right Mindfulness, and Right Concentration)**. The Middle Path is the path of peace and non-violence, which avoids extremes of all forms— such as fascism, terrorism, ethno-religious fundamentalism, communism, patriarchy, racism, consumerism and capitalism [32]. Living in the middle Path following **The Five Precepts (non-killing, non-stealing, non-misconducting, non-lying, and non-intoxicating)**— constituting the basic Buddhist code of ethics, and adhering to the **The Six Paramitas** (the six perfections)—*Dana (Generosity), Sila (Morality), Kshanti (Patience), Virya (Effort), Dhyana (Concentration), and Prajna (Wisdom)*, can transfer the sufferings into peace, joy and liberation and transform an ordinary human being into an enlightened person [33].

Since 'Right Livelihood' is one of the requirements of the Buddha's Noble Eightfold Path, there exists **Buddhist Economics**, which, in contrary to the market-driven modern economics, is value-driven, and contains reverent and non-violent attitude not only to all sentient beings but also to trees and other natural resources. **Buddhist Economy** emphasizes on obtaining the maximum of well-being with the minimum of consumption thus promoting sustainable development in real sense [34].

It is evident that there is not a single theme of today's modern scientific civilization to which Buddha's teaching cannot be applied. His philosophical teachings can be linked to economy, ecology, biodiversity, health, safety, rehabilitation, development, democracy and sustainability. Buddha's teachings have the potential from the viewpoint of practice for reducing poverty, resolving conflicts, eradicating corruption, eliminating crime and violence, establishing peace, justice and social harmony, preserving forests, cutting down carbon emissions, mitigating global warming and climate change in preventing environmental degradation and overexploitation of natural resources for solving the environmental problems paving way for a holistic socio-economic development of communities establishing societies based on value-driven Buddhist economy guaranteeing peace, happiness and well-being for all to achieve the goals of sustainable development.

The Lumbini declaration endorsed to promote Lumbini as the centre for International Buddhist studies with **Lumbini Buddhist University (LBU)** as an international centre for its excellence. This can be materialized by developing Lumbini as an academic hub, establishing institutions covering studies and researches on Buddhism and its application to a wider variety of world issues for a holistic approach leading towards sustainable development with health, happiness and prosperity to all.

As the Mahayana emphasizes that in the vast world there is always a need for more Buddhas [35], the author of this paper proposes that it be made obligatory to include Buddha, Buddhism, and the Buddhist teachings—its codes and ethics— in the curriculum of the educational institutions throughout the world, starting from the primary level. This would not only help induce and enhance students' high moral and spiritual principles but also enlighten our future generation with the application of Buddhist teachings for the resolution to a wider variety of world's problems and empower them intellectually and spiritually as scientists, leaders and messiahs. Hence Buddha's teachings should be made part and parcel of education at schools, colleges, and universities, and also to government officials, policy makers, political leaders, and rulers of our nation.

LBU—as a universal study and research centre welcoming students, researchers and scholars from all over the world for international Buddhist studies—can take the lead role on educational revolution from Buddhist perspective. LBU could become one of the leading institutions to— **(i) Create Awareness, (ii) Educate and (iii) Empower** people to take concrete actions to resolve the issues and the complex challenges of the modern civilization. These 3 essential aspects of education were proposed by the Soka Gakkai International (SGI) President Ikeda at the World Summit on Sustainable Development in Johannesburg in 2002 [36]. Such social revolution to resolve the environmental, economical, social and cultural problems is gradual, but attainable. As famously said by Mahatma Gandhi—"Good travels at a snail's pace." [37] only the continued and focused education can provide the driving force for the sustained revolution.

2.3. Promoting Buddhist Culture and Heritage

To sustain Buddha's teachings and ethical codes we have to promote and protect the Buddhist culture and historical sites, and also preserve them for the future generation.

The historical monuments of Lumbini including the monasteries, stupas, temples, peace pagodas and the Lumbini Museum can contribute considerably for the promotion of Buddhist culture through:—the Buddhist scriptures and literature, Buddhist art and architecture, Buddhist cuisine, music and chants. There are already more than 25 international monasteries built in Lumbini by countries from all around the world. These monasteries and peace pagodas should expand their services in mindfulness practices and spiritual healing through vipassana, yoga, pranayama, and meditation. The Buddhist centers should develop lecture series, workshops, classes and retreats on environmental, social and cultural education and practices based on Buddhist teachings. Preserving ancient art galleries and museums and establishing new art galleries and museums, and periodically exhibiting paintings, murals, and sculptures on Buddha and the glorious history of Buddhism could enhance the promotion of Lumbini globally.

Nepal should promote more academic researches, archeological excavations, restoration and conservation works and scholarly engagement in Lumbini, Kapilvastu, Devdaha, Ramgram, Tilaurakot and all the Buddha-related religious historical places, and develop them as tourist destination.

Besides, co-operations and coordination throughout the world are needed to preserve and promote Buddhist temples, monasteries, pagodas, sculptures, libraries, museums and art galleries. Most importantly the state needs to have strong political commitment and allocate necessary funds for these purpose.

More interactions, communications and events organization in collaboration with the international communities are needed. This could include seeking UN's endorsement for celebrating Buddha Jayanti day and organizing international Buddhist conference annually in Nepal, and developing Lumbini as the 'Pashupati' of Buddhist pilgrimage and an epicenter of world peace.

3. Conclusion:

The paper calls for promoting Lumbini as the 'Pashupati' of Buddhist pilgrimage and an epicenter of world peace by—(a) preserving its environment, (b) globalizing Buddhist teachings and education system, including their application in our life, and (c) promoting Buddhist culture and heritage. The achievements of these goals is suggested through revisiting the definition of 'Sustainable Development' by including Gross Domestic Product (GDP) blended with social safeguards, environmental safeguards, and spiritual safeguards as fundamental elements. Recommended approach to life is a novel approach with an interface where social science (law) and natural science (technology) meet spiritual science (Buddhist ethics). The blending of spiritual/Buddhist approach with the materialistic/legalistic approach would bring synergy effect for effectively and efficiently restoring, preserving, developing and promoting Lumbini. Buddhist teachings, which create a genuine sense of universal responsibility based on love, compassion, and green awareness for the society and the whole world to live in peace, harmony, happiness and prosperity, are the means for Lumbini to reach the desired goals.

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Author's Introduction

Sandhya Regmi holds Master Degrees in Environmental Engineering from the National University of Singapore and Electrical Power Engineering from Dresden University of Technology, Germany. She has over 20 years of professional experience in development sector—including Transport Infrastructures, Energy Development and Distribution, Urban Development, and Social Development—as Programme Manager, Advisor, Project Engineer, and Environmental Specialist. She has served in the roles of Executing Agencies, International Development Agencies, Public Institutions, and Private Sectors, in projects funded by State funds, ADB, OECF, JICA, UNDP and UN. Countries of her work experience include Nepal, Germany, Japan, Singapore, Vietnam and the Philippines.

She is passionate about and involved in a wide range of environmental and social issues, including literature, fine art, community development and Buddhism. She has authored several books, worked as Editor-In-Chief of professional journals, and published her research papers in peer reviewed journals. She has done over 150 oil paintings, and has held solo art exhibitions of her artifacts in Nepal and abroad to spread the message of Buddhism, Spiritualism, Environmental Preservation and Sustainability. She is a Research Scholar on Environment and Buddhism, and the recipient of Gold Medal "Ratna Vidya Padak"(1985), "DAAD Scholarship Award" (1990-1995) and UN Vienna Charity Grant Award" (2018).



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Post-Earthquake Heritage Recovery In Kathmandu Valley



- Ar. Rupesh Shrestha

1. Background

Nepal was hit by a devastating 7.6 magnitude earthquake on 25 April 2015, Saturday at 11:56 am. The last earthquake of this magnitude was in year 1934, in a difference of 81 years. Out of then 75 districts, 31 districts in Nepal were affected by the earthquakes. Nepal suffered worst damage to its heritage buildings since 1934. Data provided by Nepal Government shows that there were 753 damaged monuments out of which 131 were fully destroyed all over Nepal. Many monuments in Kathmandu's seven World Heritage Site were severely damaged.

The Kathmandu Valley heritage landscape includes seven World Heritage Sites (WHS) inscribed as one UNESCO World Heritage Site. They are:- (i) the Darbar Square of Kathmandu (Basantapur), Patan, and Bhaktapur; (ii) the two important Buddhist monument sites of Boudha and Swayambhu and (iii) the two major Hindu sites of Pashupatinath and Changu Narayan.

Cultural heritage is an expression of the ways of living, developed by community and passed on from generation to generation, including customs, practices, places, tangible objects, artistic expressions and values (ICOMOS 2002). Nepal is extraordinary due to its heritage deeply intertwined with people, identity and lifestyle. This article delves into recovery of tangible heritage of Kathmandu Valley and its challenges. Furthermore, it offers perspective on German support for cultural heritage recovery of Kathmandu Valley.

2. Heritage reconstruction after 2015 Gorkha Earthquake

Immediately after earthquake Post-Disaster Needs Assessment (PDNA 2015) report was prepared by the National Planning Commission (NPC) with support from development partners including Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)¹. The total estimated damages to tangible heritage was predicted to be NPR 16.9 billion (US\$ 169 million) (PDNA Vol B 2015).

¹ GIZ is a German development agency headquartered in Bonn and Eschborn that provides services in the field of international development cooperation. GIZ has been active in Nepal since 1974 and is active in more than 60 districts.

In May 2016, Nepal government launched a Post Disaster Recovery Framework (PDRF 2016) to provide vision and the strategic objectives to fulfil reconstruction goals. In PDRF 2016, GoN has stated that principles of disaster risk reduction and “build back better” as key elements of the reconstruction and rehabilitation policy. Sendai Framework 2015 is an international framework promotes that recovery, rehabilitation and reconstruction periods are a critical opportunity to “Build Back Better”.

The Department of Archaeology (DoA) is the responsible government organization for the archaeological research and management of the cultural heritage of the country. A six-year recovery period which would require an average of US\$ 34 million per year was proposed for the restoration and reconstruction of all damaged and collapsed historic buildings. To meet the associated challenges of post-disaster recovery, the Government of Nepal announced the establishment of a National Reconstruction Authority (NRA). Within NRA- the heritage preservation, public buildings and Infrastructure division is led by Dr. Chandra Bahadur Shrestha who is a German Alumni and a DAAD scholar. It also noteworthy that Mr. Yubaraj Bhusal, also a German Alumni and life member of NEGAAS was Chief Executive Officer (CEO) of NRA from 2017-2018.

3. Issues in heritage recovery

NRA has reported that 80% of private houses, 80% schools and 95% government buildings are in construction process all over the country (Government of Nepal 2019b, 2018). The numbers are encouraging for these sectors. However, in terms of heritage recovery- 30 % of monuments have been completed, 29 % are in process of reconstruction and 41% monuments have not even been started.

a. Conceptual debates on “Authenticity” and “Build back better” during reconstruction

A certain level of conceptual discussions has impacted on reconstruction timeline. One example is reconstruction of renowned and historic pond called Ranipokhari. This was built by Malla King Pratap Malla in 1670. When Kathmandu Metropolitan City used concrete boundary on the south-eastern side of the pond & also used cement concrete to reconstruct the central shrine, distressing conservationists and locals (A. Ojha 2019; NRA 2015) . If looked on superficially, the construction looks appreciable and in line with building a stronger monument but in Archeological or heritage conservation norms the former idea does not conform to principles of “authenticity” nor principles of natural pond conservation. Prof. Dr. Sudarshan Raj Tiwari, who is an Architecture historian involved in this activism does not approve heritage reconstruction guidelines that allows use modern or industrially manufactured materials and recommends strict use of traditional materials (Rai 2018).

b. Conflicting roles and competition

This is evident in Basantapur Darbar reconstruction where geopolitics and local politics have an impact of reconstruction. International stakeholders viz China, US, Japan, UNESCO are all active in reconstructing one or multiple monuments. Also DoA, Kathmandu Metropolitan City (KMC) and community members have taken responsibility to rebuild few damaged monuments.

In many neighbourhoods of Kathmandu valley, community led organisations strongly associate themselves with their heritage and want more responsibility to reconstruct temples and shrines

with community participation. Bhaktapur municipality even rejected German Development bank's (Kreditanstalt für Wiederaufbau- KfW) funding of 10 million Euros. The points of disagreement as stated by Bhaktapur Municipality is KfW's insistence that the reconstruction contracts be open to a global tender process, hiring of international consultants, hiring technicians only through KfW and the permission to use modern construction materials as has been done in few restoration projects like in Bhaktapur Development Project (BDP)² (Bhattarai 2018).

c. Funding

According to (PDNA Vol B 2015) an average of US\$ 34 million per year is needed for the restoration and reconstruction of all damaged historic buildings. However, fund management and procedural hassles pose as challenge to the reconstruction (Thapa 2018). Dr. Chandra Bahadur Shrestha from NRA reiterate that funding is not a problem. He, however admitted that since earthquake of 2015 was a large-scale humanitarian crisis so in terms of infrastructure construction the priority has been private shelter, health centre & government buildings. He further informed that donor agencies are reluctant to engage in heritage reconstruction or urban renewal projects.

d. Supply of construction materials

As per Nepal's Ancient Monument Preservation Act 1956 & The Nara Document on Authenticity and many other international charters, heritage reconstruction demands use of traditional materials. However supply of good quality traditional construction materials like seasoned timber from Sal wood, traditional bricks whose dimensions are as in mid-sixteenth century & stones is a major issue (Dawadi 2018). The five month unofficial blockade or embargo by Indian Government which began on September 23, 2015 also caused shortage of construction materials and delayed the reconstruction efforts (Prajapati 2018; BBC 2015; H. Ojha 2015). The economic impact of unofficial blockade from Indian Government is estimated to be US\$ 2 billion.

e. Documentation of heritage structures

Reconstruction of heritage buildings is a complex undertaking. It requires in-depth study, consultation, high quality documentation and planning before a reconstruction work starts (Banskota 2018). The reconstruction at many instances is difficult due to lack of proper inventory - previous historical records, data, images and architectural drawings. Mr. Bhisma Banskota and Mr. Dhruva Sharma from NRA reiterate that there needs to be meticulous examination and verification. Kai Weise, an architect and an active advocate of disaster risk management of

² In 1974 the then His Majesty's Government of Nepal decided to carry out an Integrated Urban Renewal and Development Project in Bhaktapur with technical cooperation from the Government of the Federal Republic of Germany. This Bhaktapur Development Project (BDP), which was confined to the area of Bhaktapur North-East during the project's first phase was extended in 1976 for another 3 years, expanding the project-activities to an area covering about 50% of the town. The overall objective of the project is to improve the living conditions of the population of Bhaktapur. BDP was concluded in 1985. German Agency for Technical Cooperation (GTZ) was partner from German side working under guidance of German Ministry of Economic Cooperation (BMZ) (Kleinert 1977; Parajuli, Amatya, and Sturzbecher 1986; Haaland 1982). BDP was a unique Nepali-German initiative to restore Bhaktapur to its former glory (Grimm 2012).

cultural heritage sites says "The restoration of such cultural heritages is not something to be rushed. Although there was a three-year deadlock due to various political reasons, the silver lining was that there was an ample time to research."

f. Lack of skilled human resource

In heritage reconstruction there is a shortage of skilled artisans, craftsman & labourers. There are limited people with quality, precision and knowledge about traditional crafts and construction. The traditional system of knowledge transfer that used to happen from a craftsman to his child is diminishing. Thus, vocational schools which produces competent craftsman skilled in traditional crafts and construction technology is felt necessary (Deupala 2019). Moreover, skilled structural engineers who can enhance seismic strength of traditional building using traditional materials is of high demand.

g. Guidelines, policies, government norms

DoA has prepared conservation notes, drawing designs and legal instruments. However conflicting guidelines make reconstruction effort complex (Thapa 2018). There is often debate between experts, academicians, archaeologist and bureaucrats about the concept, design detailing, material and technology to be used. Also, it is noteworthy that Nepal Government has a fixed financial rate for building materials to be procured and remuneration rate for manpower involved in construction. Due to market rate of building materials rising and skilled craftsman's higher remuneration rate in market, project planning and execution of reconstruction activity becomes complicated. Another challenge is the tendering process. Public Procurement Act states that government construction contracts valued at more than 500,000 rupees (S4,670) must be granted through a tender process to the lowest bidder -- and the same rules govern the restoration of ancient temples and buildings. However, these monuments must be built with highest quality and best people. And lowest bidder does not always give the desired output. Mr. Sushil Wadhwa from India stated it correctly - "If Shahjahan had settled for the lowest bid, we wouldn't have the Taj Mahal."

4. Success stories

Among major monuments in Patan Durbar - The Krishna mandir, Mani Mandap pati among others, have been restored; while in Bhaktapur, major temples such as the Shankar Narayan, Bhimsen and Kedarnath temples, among others, have been restored. In Kathmandu, however, it is only the Gaddi Baithak that has been completely renovated and Kasthamandap is under reconstruction. Kathmandu Valley Preservation Trust's (KVPT) Nepal Country Director Dr. Rohit Ranjitkar who is leading reconstruction in Patan Durbar says that earthquake of 2015 provided the opportunity to learn more about traditional construction methods so they could be revived. In Bhaktapur, the enthusiasm and consciousness among the administrators and among the general public is driving the reconstruction. It is noteworthy that Heritage reconstruction efforts in Kathmandu Valley is also supported by German Embassy Kathmandu and German organization like South Asia Institute/Heidelberg University and Gerda Henkel Stiftung.



Figure 1 Reconstruction works going on in Bhaktapur Durbar Square. Picture taken:- June 10th 2019



Figure 2 Reconstruction works of monument Maju Dega yet to commence in Basantapur Durbar, Kathmandu. Picture taken:- June 9th 2019



Figure 3 Reconstruction works going on in Patan Durbar Square. Picture taken:- June 10th 2019

5. Legacy of BDP in heritage conservation and NEGAAS as promoter for successful German projects

BDP as an urban renewal project has successfully impacted quality of life of Bhaktapur denizens. Moreover, many monuments were restored between 1974-1985. The capacity building and self-awareness that came from this project is remarkable as Bhaktapur now is confident to carry out reconstruction works itself. There are many such successful German projects which needs to be promoted so that the next generation can learn about the context and various aspects after such projects are phased out. For this NEGAAS can be a good facilitator. NEGAAS is a team of inter-disciplinary scholars where each member has acted as a goodwill Ambassadors of Germany in their respective fields.

6. Conclusion

Post-earthquake recovery has contributed in increasing resilience in Nepal. Nepal's heritage reconstruction is remarkable. There are debates, redundancies, problems but it is still providing valuable lessons and success stories. It has revived knowledge and people's activism on tradition, culture, technology and a discourse on the "Nepali way of heritage reconstruction". This can be an example for the World like the political peace process. It is a matter of happiness that German Alumni are playing an important role in Nepal's heritage reconstruction.

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Author's Introduction

Ar. Rupesh Shrestha completed his Bachelor's in Architecture from Tribhuvan University and Master of Science in Natural Resources Management & Development from University of Applied Sciences - Cologne (TH Köln) in 2014-2016 with scholarship from German Academic Exchange Service (DAAD). Currently, he is working in post-earthquake reconstruction projects in Nepal. His research interests are in post-disaster recovery, heritage reconstruction, urban resilience, disaster risk reduction and sustainable built environment. He is serving as Secretary for Nepal German Academic Association (NEGAAS). He is also a DAAD Young Ambassador for Nepal, through which he promotes Germany as a destination for higher learning.

Groundwater Arsenic Mitigation Option: Case Study From Rural Terai/Nepal



- Er. Ganga Datta Nepal

Phd. research fellow

Tribhuvan University/Nepal

(Contact: Mobile: 00977 9841831976, E-mail: nepal_ganga@yahoo.com)

Abstract

This research focused to find the socially acceptable, technically feasible, economically viable and environmentally sound options for Arsenic mitigation in southern part of Nepal- Terai region, where groundwater is the main source of water supply. This study focuses on rural part of Nawalparasi district.

For this study, 61 samples were collected from Nawalparasi district; out of that more than 50% samples have exceeded WHO standard. Field study and Focus group discussion (FGD) carried out in two different places and observed that community people are in favor of appropriate solution for Arsenic removal likely small scale overhead tank with filtration. Filtration using Bio-sand, Kanchan and Sono filters to remove Arsenic, found the negative impact; it is temporary solution for the time being. Most of the Dug wells found in study area are free from Arsenic. The spatial distribution of selected tube wells were analyzed using GIS tools.

Study also elaborated the comparative result of Arsenic test results using HACH Kit, WagTech Digital Arsenator and Atomic Absorption Spectrophotometer. In every sample result is slightly different; using HACH Kit for the Arsenic testing purposes is to know the Arsenic presence or not. The concentration level of Arsenic is found to be dynamic. Arsenic concentration level is slightly higher in pre-monsoon than in post.

Key words: Arsenic, Arsenator, Arsenicosis, Spectrophotometer, Mitigation, Blanket-Testing

1.0 Introduction

Arsenic (As); one of the oldest poisons known to mankind and a known human carcinogen, has created serious contamination of the environment and caused much mass poisoning throughout the world. Arsenic contamination has become a problem in many parts of the world. Arsenic (As) is a metallic main group element, found in Group V (b) of the periodic table with Atomic Number 33, and relative atomic mass 74.92. Arsenic was first introduced as the metal by Albertus Magnus about 1250 AD.

Arsenic exists in the trivalent and pentavalent state and its compounds may be either organic or inorganic. Inorganic Arsenic is a natural part of the earth's crust in some parts of the globe and may be found in water, which has flowed through Arsenic-rich rocks. There has been wide and varied debate about the source of the Arsenic, but it is now widely accepted that the source of the problem in Nepal, India and Bangladesh is generally from the underlying geological strata. In Nepal, arsenic originates from naturally occurring sources, because there is no evidence of drinking water being contaminated by industry. Arsenic is found in the minerals as oxides, sulphides and arsenides:

- *Arsenolite, As_4O_6*
- *Realgar, As_4S_2*
- *Orpiment, As_2S_2*
- *Mispickel or Arsenical Pyrite $FeAsS$*
- *Cobaltite or Cobalt Glance, $CoAsS$*
- *A Tin White Cobalt, $AOAs_2$*
- *Arsenical Iron, $AsFe$ and As_4Fe_3*
- *Nickel Glance, $NiAsS$*
- *Kupfornickel, $NiAs$ etc.*

1.1 Arsenic problem in the region

South Asian region, including Nepal has been identified as the most highly Arsenic affected area of the world. More than 50 % the total population of Nepal lives in 20 Terai districts of Nepal uses about 1.12 million (approx.) tubewells for their daily drinking water supply. All those Tube wells were tested for Arsenic and 7.5 % were found to have Arsenic level more than WHO guideline value of 10 ppb. While, 2,12 000 people inhabiting the region are believed to have been exposed to Arsenic levels greater than Nepal National Standard of 50 ppb in their drinking water are at critical threat. Health survey conducted in the most highly contaminated areas shows that 2.5 % (approx.) people already have symptoms of Arsenicosis.

Before 1980s people in Terai region of Nepal consumed raw water directly (without any treatment) from dugwells, rivers, canals or ponds that were normally much polluted and pathogen contaminated. In that time, epidemics of cholera, diarrhea, typhoid and other water-borne diseases were very common in this region. Thousands of people particularly the infants used to die only because of drinking that unsafe waters. From 1980s an idea of tapping ground water came as the most popular program for controlling many waterborne diseases by providing clean and pathogen free drinking water. Although emerging number of tube wells succeeded in reducing the number of death from waterborne diseases, many of tubewell-waters were found to be with arsenic level more than the WHO recommended guideline value of 10 ppb.



Figure 1: Bangladesh, West Bengal (India) and Nepal

First in 1984 groundwater Arsenic contamination was discovered in lower Ganga Plain of West Bengal, India. The catastrophic appearance of Arsenic contamination in Bangladesh ground water and consequential suffering of people were revealed only in 1995. Nepal is located virtually very close to Bangladesh (south of China and north of India), therefore the widespread presence of Arsenic in groundwater of Bengal Delta Plain (BDP) triggered a suspicion that similar problem may exist in southern part of Nepal as it falls same hydro-geological region.

1.2 Arsenic Problem in Nepal

Investigations on Arsenic contamination of ground water in Nepal began in 1999 by the Department of Water Supply and Sewage (DWSS), Nepal with the financial assistance of World Health Organization (WHO). The first study was conducted in the groundwater of three eastern Terai districts namely Jhapa, Morang, and Sunsari. Then DWSS with other stakeholders the blanket Arsenic testing of all 20 districts has done. The percentage of the contaminated Tubewell is shown in Figure, which depicts that in six districts, more than 10 % Tubewells were contaminated with the Arsenic concentration level of 10 ppb or more. This percentage is as high as 26 % in Nawalparasi district, while approximately 21 % Tubewell were observed with such level of contamination in Rautahat district and 16 % in Siraha district.

Before 1980s people in Terai region of Nepal consumed raw water directly (without any treatment) from dugwells, rivers, canals or ponds that were normally much polluted and pathogen contaminated. In that time, epidemics of cholera, diarrhea, typhoid and other water-borne diseases were very common in this region. Thousands of people particularly the infants used to die only because of drinking that unsafe waters. From 1980s an idea of tapping ground water came as the most popular program for controlling many waterborne diseases by providing clean and pathogen free drinking water. Although emerging number of tube wells succeeded in reducing the number of death from waterborne diseases, many of tubewell-waters were found to be with Arsenic level more than the WHO recommended guideline value of 10 ppb.

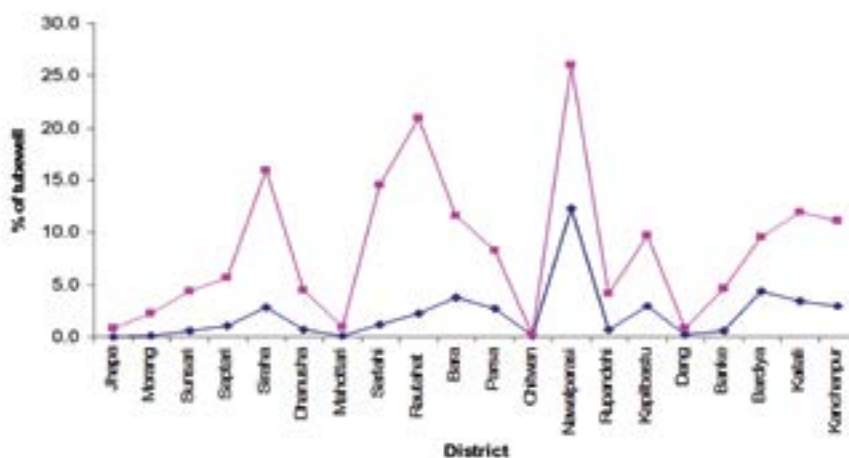


Figure 2: District-wise percentage of Arsenic contaminated Tubewell

Source: DWSS (2010)

1.3 Objective of the Research study

The main objective of this study is to find, support and recommend socially acceptable technically feasible, economically viable and environmentally sound options for Arsenic mitigation in southern part of Nepal i.e. Terai region. Most of the tubewells in Terai found to be not only contaminated with Arsenic but also together associated with high iron and manganese content. Study of Arsenic mitigation options will be undertaken to assess water quality and sanitary condition and to estimate the burden of diseases associated with technology in disability adjusted life years (DALYs). This research will be focused on rural people's preferences for Arsenic-free drinking water options; particularly focuses on technological options of rural households. So this study focused on sustainable solution (affordable) of Arsenic contaminated Groundwater. In the same way researcher suggest some alternative mitigation options for the poorer household and communities.

1.4 Research Location

Main focuses of this research study is to provide and recommend sustainable solution to provide the Arsenic free groundwater for the community people. So, the general Research area will be the whole Arsenic contaminated communities and clusters of 20 Terai districts of Nepal. But it is difficult to visit all the places so the specific Research areas are only some clusters and communities i.e. **Pratappur VDC (Ward No. 1 & 2) and Ramgram Municipality (Ward No. 12 & 13) of Nawalparasi district.**



Figure 3: Research Area in Nawalparasi district

Source: Plotting of GPS data of tested tubewells (Nepal, 2012)

2. Research Methodology

This study is based on primary and secondary data; more specifically it is based on primary data. This study area mainly focused on Pratappur VDC Ward No. 1, 2 and Ramgram Municipality Ward No. 12, 13 of Nawalparasi district; both areas are highly Arsenic affected areas. Primary data is collected as per sample survey; basically, information' are gathered through the following ways:

- Field visit and assesses the existing situation.
- Focus Group Discussion (FGD) with community people to find the best technological options for the Arsenic free water supply.
- Sample tests conducted using digital Arsenator - firstly on pre-monsoon i.e. month of June and secondly on post-monsoon i.e. month of September. Some samples were tested in laboratory using Atomic Absorption Spectrophotometer (AAS) method for the more accurate result. In some samples of filtrate water from KAF and SONO filter also tested.
- The secondary data have taken from materials published by DWSS, National Water Quality Steering Committee, National Arsenic Steering Committee (NASC) and various other researchers and institutions.
- Comparative study of Arsenic sample result with field based HACH-Kit, Wagtech Digital Arsenator and AAS Lab.
- Simple Office packages like Ms- Word, Excel, and Statistical Package "SPSS, GPS and Geographical Information System (GIS)" software were used for data analysis and interpretation.
- Figures, tables and maps are included as per the requirement.

Similarly, Observations and FGDs of the Research area have done for the assessment of physical and operational status of the tubewells. At the same time observation of community have done from different perspectives like technical, health, ethnic and social aspects.

2.1 Research Questions

The research study mainly focused on the following research questions: to be used during focus group discussion at the community;

- *Why community people needed Arsenic Mitigation Technology?*
- *What are the possible Technological options for the sustainable Arsenic Mitigation?*
- *Can community people afford the sustainable solution of Arsenic mitigation?*

3.0 Research Result Analysis

During the field visit, asked the community people for the Arsenic test result of their Tubewells; which was done during the blanket testing. Only few households could provide the certificate of the test.

HACH Kit field testing principle is as follows:

- As^{+5} is reduced to As^{+3} by adding Potassium Iodide (**KI**) and Stannous Chloride (**$SnCl_2$**) in an acidic environment;
- As^{+3} is allowed to react with the hydrogen ion, generated by the reaction of hydrochloric acid (**HCl**) and Zinc (**Zn**) granules to form arsine gas (**AsH_3**);

The Arsine gas produced is passed through a roll of cotton moistened with lead acetate solution to avoid

possible interferences due to sulfide and antimony present in the sample water. The purified Arsine gas then passes through mercuric bromide coated paper, producing a yellow-brown stain of varying intensities depending on the amount of gas. This stain is then compared against a color-coded chart indicating the correlating Arsenic concentration in ppb.

After completion of 20 minutes reaction period, the cap was removed and the mercuric bromide paper was compared to the color-coded chart provided. The chart measures levels from zero ppb to 500 ppb and is delineated in intervals of 25 ppb from 0 to 100 ppb, and in intervals of 50 ppb from 200 ppb to 500 ppb.

3.1 Verification from Field Arsenator Test

Total of 63 samples were tested using digital Arsenator; the Arsenator test procedures are based on the following principles:

- As^{+5} is reduced to As^{+3} by adding Sodium Borohydrate in an acidic environment;
- As^{+3} is allowed to react with the hydrogen ion, generated by the powerful reducing agent Sodium-borohydrate to form arsine gas.

The Arsine gas produced is passed through a Trifler Arsenic trap loaded with bung to avoid possible interferences due to sulfide and antimony present in the sample water. The purified arsine gas then passes through preloaded black Arsenic filter containing mercuric bromide paper, producing a yellow-brown stain of varying intensities depending on the amount of gas. The excess gas coming out through the black Arsenic filter is finally trapped in a red removal filter. After 20 minutes of reaction period the black arsenic filter is removed and insert into the Arsenator. The digital Arsenator showed reading of Arsenic contain of particular sample. Arsenator can detect maximum 100 ppb of Arsenic level of a sample and for excess results colour chart is provided.

3.2 Laboratory Test using Atomic Absorption Spectrophotometer Method

Twenty samples representing from Pratappur VDC Ward No. 1, 2 & Ramgram Municipality Ward No. 12 & 13 were brought to Kathmandu for Laboratory testing using Atomic Absorption Spectrophotometer (AAS). Those samples were collected from public/private tubewells which showed different result as shown by HACH Kit and Arsenator. Following process involved during the sample collection:

- Sample bottles were labeled (pre-acid washed bottle of 250ml)
- Water bottles were cleaned several times before collecting the sample then filled the sampling bottle.
- Sample bottles were rinsed and filled with sample leaving some space preservative (Conc.HCL).

3.3 Pre-monsoon and Post-monsoon Test Result Analysis

In both pre and post monsoon same tubewells of Pratappur VDC Ward No. 1 & 2 and Ramgram Municipality Ward No. 12 & 13 were tested; to observe and compare the concentration level of Arsenic; pre-monsoon water table is lower than that in post monsoon.

The figure below shows the test result of the sample pre-monsoon and post-monsoon. It is found that in most of the tested tubewells result shows that concentration level of Arsenic in groundwater is higher in the pre-monsoon than in post-monsoon. It is because of water table, when water table is higher than Arsenic concentration level is lower vice versa when water table is lower Arsenic concentration level is higher.

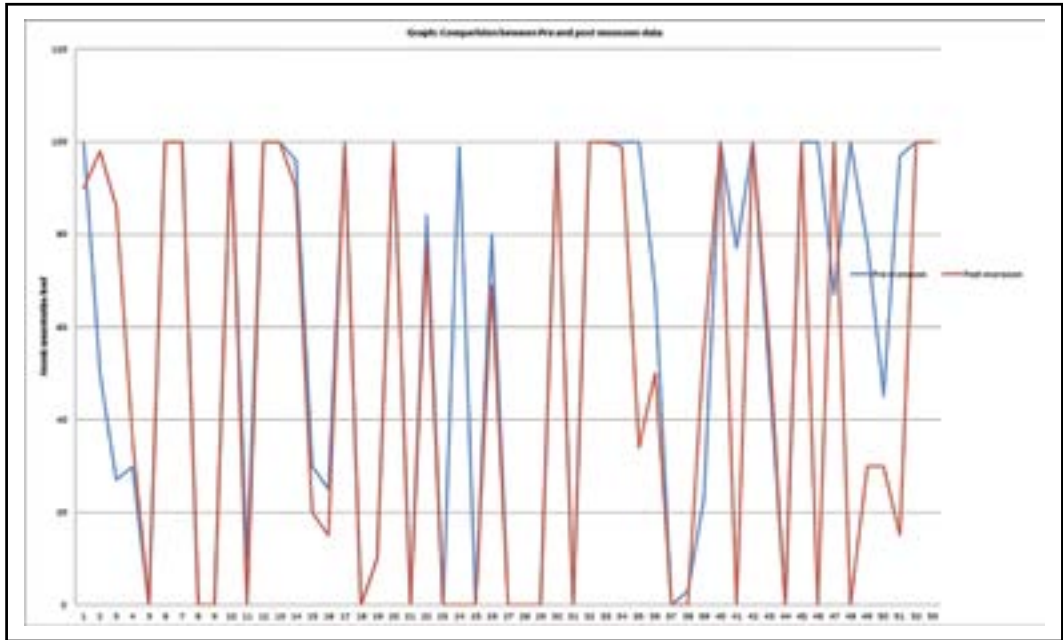


Figure 4: Comparison Between Pre and Post Monsoon data

Source: Nepal (2012)

3.4 Comparative Study of the result from HACH Kit, Wagtech Digital Arsenator and Atomic Absorption Spectrophotometer (AAS) Laboratory

The concentrations of Arsenic in drinking water can be determined by test kit method (semi-quantitatively at field level) and by laboratory analysis (quantitatively). In this aspect, several researchers have reported that many of the arsenic test kits give inaccurate results but do not indicate why this inaccuracy occurred. It may be unrealistic to expect that the field test kits will give the quantitative result as obtained by the more expensive AAS and ICP methods. But field kits should have given estimates as close as possible to quantitative estimates so that the variations do not jeopardize permissible standards. Different literature review provides an indication for a comparative analysis of different arsenic field testing kits. In this background this study was undertaken to re-examine the test kits in order to adopt an appropriate strategy of using the test kits. Many Researchers found that field Test Kit's deviation from Laboratory Analysis result is found to be upto 75% and field performance of Wagtech Digital Arsenator deviation is upto 40%.

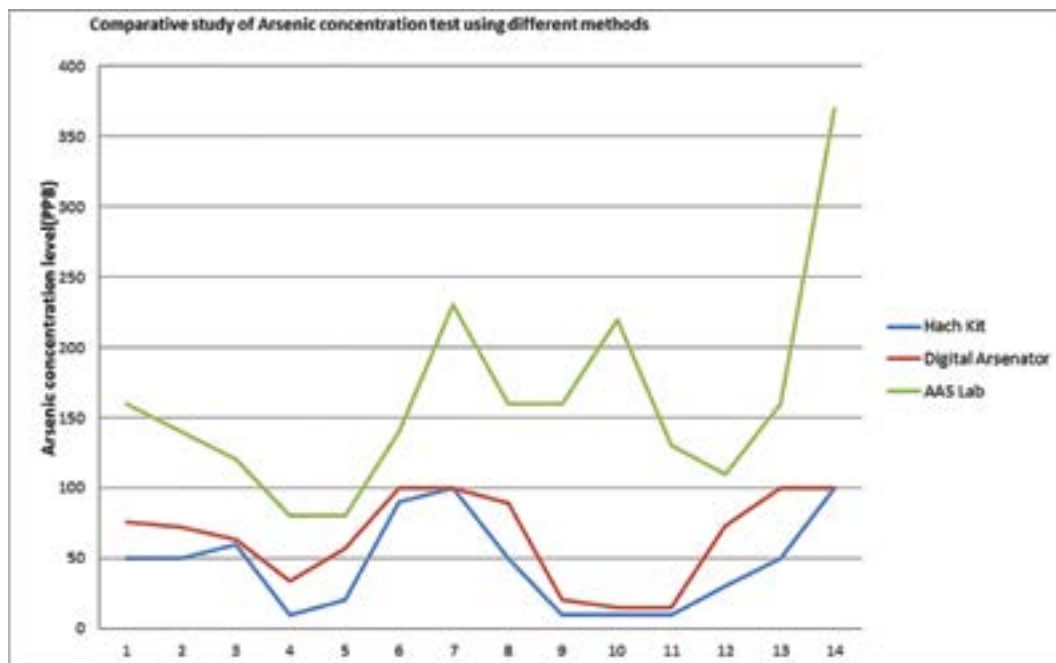


Figure 5: Comparative study of Arsenic in Nawalparasi district using different testing methods

Source: Self Tested and Lab result (2012)

The above figure showed that the comparative study of 14 samples using different test media. Almost every sample AAS analysis from Water Engineering & Training Centre (P.) LTD. (an accredited Laboratory under NEPLAS, Pra-08/065/66) result is always higher than the Digital Arsenator and HACH Kit analysis result. Similarly, Digital Arsenator reading is also slightly higher than HACH Kit result. In some samples HACH Kit, Digital Arsenator and AAS Laboratory result is highly deviated.

From the Three different methods, it is found that field test kits can only be used for **'Yes/ No' result** of the sample arsenic concentration. Grading of water according to different level of arsenic by the field kits doesn't work effectively. Laboratory method i.e. - AAS or other techniques should be the ultimate solution of arsenic detection in tube well water. Also the testing by Wagtech Digital Arsenator is better options to get a more dependable estimate of arsenic under field conditions in comparison to HACH kits. The reliability of the field test kit result; will not be comparable with the laboratory analysis because there is always up to 15% or sometimes more differences with the laboratory analytical results.

3.5 Focus Group Discussion

During field visit, Two "Focus Group Discussion (FGD)" were done to know how the views of community people towards best Arsenic mitigation options. The FGD were done with the more than 50 Families of Pratappur and Ramgram Municipality, Nawalparasi district; to know their views for the Arsenic Mitigation Options. Their primary complaints were: almost 80% of the filtering devices worked only intermittently; attaching the device

to the tube-well involved certain procedures and mechanical repairs that the villagers had not been trained to do, such as placing a valve at the mouth of the well or replacing packing material at the head of the well to facilitate the flow of water. Other problems included injuries caused by tube-well handles leaping up suddenly when depressed; water spraying from the top of the tube-well when the handle was depressed; the valve at the mouth of the tube-well getting jammed; and the devices producing yellow-coloured water. For some devices, the clean water produced was being consumed by cattle even though it was meant only for human consumption. We also found instances in which villagers were using the filtered water for washing and bathing.

Because of the problems they encountered, the villagers were unwilling to install the filtering devices on their tube-wells. Although most of the filtering devices were not functioning properly, we did find a few that were capable of removing Arsenic and functioning well if they were properly maintained, backwashed regularly and if the community was involved in maintaining them. In fact we also found that if the devices were not backwashed properly, Iron and Arsenic concentrations in the treated water were higher than in untreated water.



Figure 6: Focus Group Discussion at Ramgram Municipality-12

Source: Nepal (2012)

The research findings indicate that, after taking into consideration the initial and recurring costs, convenience, associated risks and the advantages and disadvantages of each selected technology, the preference of the rural people is overwhelmingly firstly in favor of small scale overhead tank - piped water supply and secondly using of safe Dug well. The analysis reveals a strong demand for piped water in both arsenic-affected and arsenic-free rural areas, and scope of adequate cost recovery between piped water and other arsenic mitigation technologies, the preference of the rural people is found to be predominantly in favor of the former.

4.0 Conclusions

During field study; six Arsenic mitigation technologies were discussed during: Three-pot method, Kanchan Arsenic Filter (KAF), SONO Filter, Bio-Sand Filter, Using of safe Dug well and small scale overhead tank - piped water supply.

The conclusion is drawn as follows:

- The first priority for mitigation is prevention of further Arsenic exposure by providing alternative sources of safe drinking water thus, study the feasibility of possible alternative sources of Arsenic free drinking water like extension of piped water supply, low cost dug well improvement, water supply through safe wells and Arsenic removal filter supply has to be planned according to the availability and sustainability, which should serve highly affected community.
- Small scale Overhead Tank Technology should be introduced within community; community people are eagerly waiting for the sustainable means of water supply with treatment facility.
- Acceptance levels of using of KAF and SONO Filters have negative result. Community people are not in favor of using of filters; as it is tedious for the regular using and cleaning.
- It is found that sample filtrate water from KAF and SONO have negative result i.e. Arsenic concentration level found to be up to 100 ppb.
- A hydro geological investigation is one of the urgent study need to be conducted in Nawalparasi on the basis of result data of blanket Arsenic testing program and GPS data to identify Arsenic distribution pattern throughout the district. This will help to prepare guidelines for future water supply system through tube well and also will help to find out safe aquifer around the Hot Spot area during the mitigation.
- Treatment for arsenic should only be considered if an alternative low-arsenic water source is not available and the treatment system should be simple and easy to handle, using of filters and 3-pot filter supplied were found to be unused in some communities of the district.
- Ramgram municipality is severely affected area, where large numbers of Tube wells are found to be contaminated with arsenic.
- Arsenicosis awareness campaigning, Health surveys and mitigation activity must be conducted in the most severely affected Municipality/VDCs.
- The nutrition programme should be launch as a part of awareness raising activities in the Hotspot communities to avoid adverse effect of Arsenic.
- Effective district level Arsenic mitigation ACTION PLAN should be by the major stakeholders.

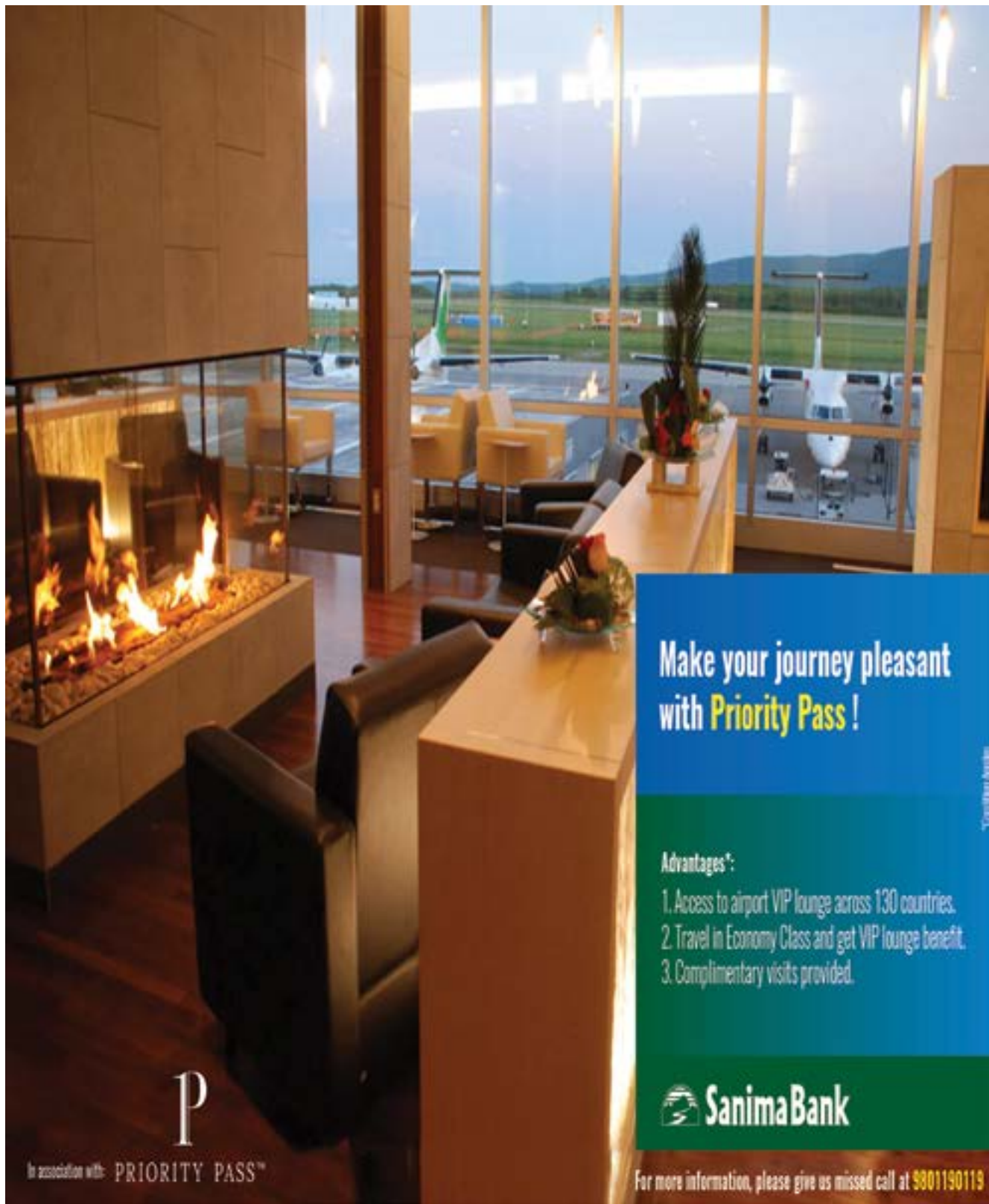
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Author's Introduction

As I grew up in Nepalese Himalayan terrain of remote area, I have a lot of fascination travelling in rural setting, passion for service contribution in needy areas and poverty stricken communities. Doing PhD in WASH and Climate Change, awarded Master's Degree in Civil and Environmental Engineering from KIT, Germany and Rural Development from TU, Nepal. Additionally, PG Diploma from IHS, Rotterdam, The Netherlands. Such high level education further drives me to be a triggering agent for community betterment and advancement. Further includes managing, conducting, facilitating workshops, training, study lead, survey, group discussions, assessment on socio-economic, health, education, WASH programs: planning, management, monitoring Evaluation, team leading, local resource mobilization, coordination, communication are additional to my expertise.



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Addressing Water issues in Nepal through Managed Aquifer Recharge (MAR)



- Ms. Sabina Khatri

Background:

Water is basis of life. Earth itself comprises of 71% of water, out of which, only 2.5% is fresh water, fit to drink. Groundwater covers 30% of that fresh water proportion (Wikipedia, 2019). The inevitable urbanization with ever growing population, has incurred enormous & diverse water demand, resulting in over-exploitation of the groundwater, the resource being instantly available. As a result of over-extraction of groundwater, aquifers go dry. Climate change is worsening the water scarcity and adaptation scenario. On the other hand, huge amount of water (rain water, treated wastewater, wastewater) are being wasted. In recent decades, the cases of flood have even been reported in many cities around the globe. Managed Aquifer Recharge (MAR) could be one solution to meet the water demand, while it also could help control flood. The basic idea here is purposeful recharge of water into the sub-surface aquifers for subsequent recovery.

History:

Kathmandu Valley's first recorded acute water scarcity dates back to the *Lichhavi* reign with the influx from neighboring districts resulting in population boom. To meet that water demand, the then engineers/technicians suggested a remarkably sustainable hydraulic system that connected surface, sub-surface water source, distributed through network of underground channels and stone waterspouts were the outlets. The technique were introduced in the Kirat dynasty, further expanded and improved by *Lichhavi & Malla* dynasty. 1895 was the year when the modern piped water supply system was first introduced in the Valley.

Similar kind of practices of water management called basin irrigation can be tracked back to the 3100 BC in ancient Egypt. The networks of earthen banks of various sizes were constructed parallel and perpendicular to the river.

Problem Statement:

In current scenario, Kathmandu valley is facing yet another major water crisis, hitting the population like never before. This demands modern quick fixes, whereas the traditional water supply system can't be discounted. *Hitis* are running dry, so are the taps. According to Forum for Urban Water and Sanitation, the valley once fed by more than 600 *Hitis*, less than 400 were functioning by 2006 while they are down to 60 today. Not only the water resource, also we are losing our pristine historical and cultural significance an important part of *Newari* festivals and rituals like *Sithi Nakha*, our Water Heritage. Likewise, the Valley was flooded in the year 2015, followed by the same in year 2018. There is an increasing trend of flood in the valley.

Managed Aquifer Recharge (MAR) could be one measure in solving all the aforementioned water problems in the valley. The flood water can be infiltrated back into the surface. The *Hitis* can be rejuvenated scientifically.

Kathmandu is at the brink of facing water extremity events. Action is needed if our city is to remain water safe and stay prepared, but not at the cost of its architectural, cultural, social fabrics.

Introduction to MAR:

Managed Aquifer Recharge (MAR) is the purposeful recharge of water to aquifers for subsequent recovery or environmental benefit (Commonwealth of Australia 2009). It is an exponentially growing global practice in response to increasing water crisis as it has been proven to be less expensive, more environment friendly, as it has lesser impact on surface environment & affinity as well as carbon footprints.

Based on the target zone of hydrological recharge, this artificial recharge can be classified also as below:

1. Surface infiltration
2. Unsaturated Zone Infiltration
3. Injection wells
4. Conjunctive systems

Possible sources of water in MAR

1. Reclaimed water
2. Rain water
3. Mains water
4. Groundwater from other Aquifer

Types of methods in Managed Aquifer Recharge:

There are various types of Managed Aquifer Recharge. Irrespective of any particular methods, the selection of suitable method of MAR depends on the local situation which is usually controlled by the factors like type of aquifer, topography, land use and the end-purpose of the recovered water.

Herein are listed most of the methods available and practiced throughout the world:

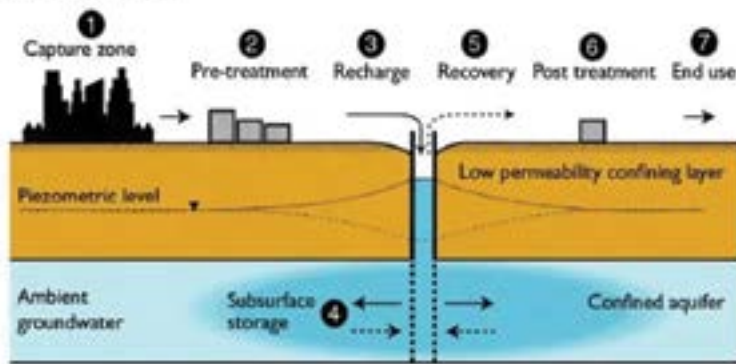
1. Aquifer storage and recovery (ASR)
2. Aquifer storage, transfer and recovery (ASTR)
3. Infiltration Ponds

4. Infiltration galleries
5. Soil aquifer treatment (SAT)
6. Percolation tanks or Recharge weirs
7. Rainwater harvesting for aquifer storage
8. Dry wells
9. Bank infiltration
10. Dune infiltration
11. Underground Dams
12. Sand dams

Components of MAR system:

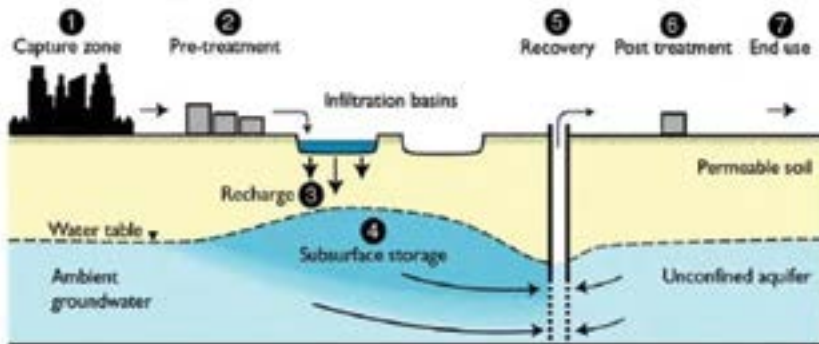
Generally a MAR site has following seven components as shown in the following figure. Mainly, there are two types of aquifers; one is confined by a low permeability layer, which requires injecting well for MAR, other is unconfined that allow water to infiltrate through permeable soils. The water source, treatment and end-use can vary according to sites.

CONFINED AQUIFER



(a)

UNCONFINED AQUIFER



© Commonwealth of Australia 2009

Investigation of the MAR sites and methods involved:

Investigation is the first step in setting up any MAR sites that enables one to take decision in designing and monitoring the site which ensures the project sustainability. In general, the investigation process in MAR includes the following aspects:

1. **Assessment of water demand:** The study of the demand for recharged water should indicate the warranty of consumption after the implementation of the MAR project, or any sure impact to environmental aspect.
2. **Hydrological and Hydrogeological assessment of the area:** This study should include feasibility of a source with suitable aquifer which should have an adequate rate of recharge, sufficient storage capacity and capability to retain water during recovery.
3. **Geological assessment of the area:** Various studies like susceptibility of the geo-hazards like earthquake, flood, tsunami, volcanoes in the site should be carried out carefully.
4. **Design & Risk assessment:** A stable and fully functional design with other mandatory infrastructure is designed. The risk assessment usually addresses health risks and environmental risks.

With proper monitoring strategy, one can assess the efficiency of the system, sort out and solve the problems in the system as quickly as possible, prolonging the life of the MAR system.

Following are the key factors in the design and proper management of a MAR site in order to implement it successfully: (Bouwer, 2002)

1. Site and system selection
2. Maintenance of adequate infiltration rates
3. Hydraulic conductivity between the recharge system and the aquifer
4. Groundwater control for effective water recovery
5. Prevention of undue groundwater rises in recharge area

Possible Practices in the Valley:

Water extreme events (scarcity, flooding) is happening and is inevitable. We are beyond the prevention limit. All we can do is minimize the damage, rehabilitate and manage the available resources. MAR bears the possibility to enable us to attain such goals. Following are the most like possibilities MAR practices in Nepal:

- **Rehabilitation of Ancient Hydraulic Systems, rituals and culture:** The networks of the the then water distribution systems (*Ponds, Rajkulos, Hitis*) can be rejuvenated by constructing infiltration ponds, infiltration galleries, recharge wells in new locations, depending on the availability of open spaces. This will not only restore the water heritage but our cultural heritage and traditions.
- **Management of Wastewater:** The wastewater which is problematic and polluting the rivers can be recycled and reused by infiltrating back into the sub-surface aquifers. Although, pre-treatment is a must for this particular case. Liquid can infiltrated while the solid by-product from this process can be used as fuel-cakes, or manure with higher economic value which is practice of

circular economy.

- **Mitigate the losses due to Flood:** The water mass encroaching the settlement during floods can be diverted towards various water storage MAR structures like dug recharge wells, infiltration ponds, infiltration galleries, etc making a widely distributed network of such structures on the basis of the study of affected areas in earlier flood events. This results in vertical storage of water rather than horizontal distribution such that decreasing the perimeter of flood prone zone.
- **Rainwater Harvesting:** It is the most widely practiced MAR technique. The valley receiving average annual rainfall of 1600mm can be harnessed to mitigate the water scarcity scenario and can prevent water-clogged temporary ponding condition in the valley. It has economic (energy-wise) as well environmental benefits.
- **Rejuvenation of Springs/ Kuwas:** Many water sources nearby many settlements went dry after 2015 Earthquake event. This has resulted in an enforced migration in many cases. MAR techniques like recharge ponds, infiltration ponds, and infiltration galleries can be constructed. The water sources can be rain water or water pumped from rivers.

Conclusion:

Rather than water scarcity, Kathmandu is actually facing the issue of water mismanagement. MAR proves to be one promising and reliable tool to tackle this alarming situation. It bears capacity to address and impact various facets of sustainable development goals. This explains the wide popularity of MAR globally.

MAR will re-establish a sustainable water source in the valley again; also re-instill the associated culture and tradition, our water-heritage. Apart from that, it enables us to break the industrial take-make-waste chain and initiate the circular economy in water sector. Likewise, it can help preserve our social fabrics by minimizing or by stopping the migration due to water scarcity or flood in some cases.

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Hitis: Stone taps

Rajkulos: surface and sub-surface network of water tunnels

Kuwas: Water body where spring water are tapped and surrounded by rocks to collect water

Sithi Nakha: A tradition of cleaning water spouts

Newari: Referring to Newar, the historical inhabitants of the Kathmandu Valley

Lichhavi: Rulers in Nepal from approximately 400 to 750 CE

Malla: Rulers in Kathmandu valley from 10th to 18th Century

Kirat: Rulers in Nepal until 158 AD

Author's Introduction

Sabina Khatri holds MSc in Tropical Hydrogeology and Environment Engineering from the Technische Universität Darmstadt, Germany and MSc in Geology from Tribhuvan University, Nepal. She has specialized in water management and environmental issues. Currently, she is affiliated with the Department of Water Resources and Irrigation of Nepal Government. She has over 7 years of working experiences in water sector including groundwater, water-induced disasters, water contamination and mitigation, water and wastewater relationships, depletion of water sources followed by rehabilitation, etc. She is the life-member as well as treasurer (2018-20)EC of NEGAAS. Also, she is a DAAD Young Ambassador 2018-19 of Nepal.

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Energy Crisis: A Global Concern



- Col. Dr. - Ing. Lila Raj Koirala

Introduction

Energy crisis has been a serious problem for world for the last few decades. The main reason for the crisis is the amount of world's energy resources which is declining gradually and lack of proportionality of energy between nations. The oil prices have increased to such levels that it has become very difficult for power plants to use oil as fuel for generating power.

Main reason for this rise in oil prices is the political instability in the oil rich nations. Energy crisis has turned out to be the most crucial problem not just for developing nations but also for developed nations. According to a survey taken by International Energy Agency (IEA), energy usage has increased rapidly in the last two decades because of speedy advancement in technology, industrialization and growing dependence of users on energy. It is predicted that this trend will continue to increase over the next few decades and keeping these statistics under consideration energy crisis principally becomes a global concern.

This article will reveal those factors that aided in energy crisis becoming a global concern and would also explain sequentially on how to resolve each factor and which measures must be taken to use and generate energy economically.

Factors Promoting to Energy Crisis

The demand for energy continues to increase in growing world economies such as India, Pakistan, Bangladesh etc. The main reason for this increase in procurement of energy is industrial expansion and rising population. However, these nations lack the proper infrastructure and power system network to furnish their growing energy necessity. Most of the power generation is through the use of old technologies which lack the capability to effectively convert the burning fuel's energy into useful power. The efficiencies of these power plants range within 25 – 30%. Due to this a lot of energy is wasted at the state of generation. The distribution side is not good either due to the increased transmission losses and poor conductors being used for transmission. The transmission network is outdated and needs an improvement to avoid the losses. Frequent load shedding in these regions has more intensified the crisis further as it had affected the industrial growth adversely.

Let us look at the developed nations and discuss what the critical issues are for them. The very first issue is the increased oil prices. Most of the oil and gas reservoirs of world are in hands of few unstable countries. Amongst these include Africa, Iran and Persian Gulf which cover more than 75% of the total earth's reserves. For Europe, continuous supply of natural gas has always been a concern as Russia is not a reliable source. As a result, governments of developed countries want to invest more in the areas where they could generate energy using their own resources in order to avoid dependence on other countries.

Ways of Resolving the Crisis

There are many resources for sustainable energy in the world. However, due to lack of technology these resources still need to be discovered. Despite this fact one must look at the alternative energy sources which could be employed to generate pure energy without affecting the environment. Solar, wind, bio-fuel, geothermal etc. are the alternating energy sources for clean and reserve energy. Amongst the alternating energy resources emphasis is given to solar energy because it seems to be the most realistic one in becoming the fundamental source of generating clean energy for world in the years ahead.

The cost of solar panels is still much high for utilizing this alternative energy source for power generations at developing countries. However, there are hopes that within the next decade solar would be the primary source of power generation in most of the nations.

According to a recent prediction made by International Energy Agency (IEA), solar power would replace the conventional power generation projects in majority of countries within the next 50 years. There are still many design issues along with power quality and quantity and need to be taken care of before the traditional grids could be converted into solar grids.

Other way to address the global energy crisis is by utilizing the generated energy in an efficient and restricted manner (in small quantity). There is need of reducing this increasing trend of energy consumption and being more intelligent in conserving the energy. Besides the user end, power plants need to be upgraded with latest new technologies to use most of the energy generated from the burning fuel. Spinning reserve (i.e., the online reserve capacity that is synchronized to the grid system and ready to meet electric demand immediately and maintain system frequency stability during emergency operating conditions) has been a concern for power plants for quite some time and proper solution needs to be investigated to avoid wastage of costly fuel.

Nowadays, many companies have been trying with great care and determination to make Smart Grid an engineering reality. Smart Grid is an elaborated system of power conservation and distribution. The set up involves incorporation of sophisticated algorithms to manage the distribution for higher performance not just for consumers but also for power utilities. Micro grids which serve as a perfect solution for power system could appear properly elegant when incorporated with the Smart Technology for improving the power quality, reducing the carbon emission and increasing reliability. Micro grids address the issue of increased energy demand through efficient distribution. Already, very large power companies of world such as General Electric Company (GE) and Siemens are investing extremely huge amount of money in the research and design of these new power plant technologies. General Electric Company claims to convert the conventional grid to the Smart Grid within this decade.

Another way to resolve the energy crisis is through combined cycle power plant (CCPP). The more positive aspect of combined cycle power plant is enhanced efficiency, reduction in fuel cost and improved reliability. Combined cycle power plants use natural gas for power generation produced from the burnt coal. The wastage heat is used to run a steam power plant through exhaust pipes.

By utilizing the heat that could have been wasted in the absence of another turbine the overall efficiency of the system is increased to 55 – 60% which in case of single steam power turbine could not be achieved more than 35 – 45%. Siemens broke all previous records of efficiencies of power plants by applying Combined Cycle Power Plant (CCPP) with their newly designed turbine achieving an efficiency of 60-75% during the test run.

Besides just looking on for energy sources it is also required to address the issue of global warming which has also become a much more worried one. We are still on the way of finding effective sources of clean and pure energy but until then we must reduce the impact of Carbon Dioxide (CO₂) emissions to the atmosphere.

This could be made possible through the use Carbon Capture and Storage (CCS) technology which involves capturing the residual Carbon Dioxide (CO₂) and depositing it at specific storage sites rather than releasing it in the environment.

Conclusion

From the above text, it is quite clear that there exists as a solution oriented model which may be effective for mitigating if not eradicating the energy crisis. Many of the issues could be addressed with the technology imminently to handle the imbalance between the demand and supply of energy. In parallel to this, research needs to be completed on renewable energy resources so that they could emerge to be the replacement of world's increasing energy demand over a long period of time in the future.

Author's Introduction

Col. Dr. Lila Raj Koirala, born on 2nd October, 1967 in Pokhara – 5, Kaski, Nepal is a Mechanical Engineer. He obtained his Bachelor's Degree in Science with Gold Medal from Amrit Science College (ASCOL), Tribhuvan University, Kathmandu (1988). He completed his Master's Degree in Mechanical Engineering from Helmut – Schmidt University/University of federal armed forces, Hamburg, Germany (1994) as a recipient of scholarship scheme from the government of Germany. Later, he again received a scholarship from the same university in Germany and did Ph. D. in Mechanical Engineering (2004). During his research time from 2001 until 2004 in Germany, he worked as a research assistant on Engineering Thermodynamics and Heat Transfer researches conducted in the university. He has served United Nations (UNMISS) for one year as an UN observer in South Sudan (2015). He has 28 years of work experience as Mechanical Engineer in Sundarijal Arsenal Office, Nepalese Army and retired from the Army as technical Colonel (2016).

He is presently Associate Professor at Department of Mechanical Engineering in Kathmandu Engineering College (KEC), Institute of Engineering (IOE), Tribhuvan University, Kathmandu. He has been involved in teaching various subjects, particularly Engineering Thermodynamics and Heat Transfer and Workshop Technology to undergraduate students to all engineering disciplines. During past eight years, he has gained substantial experience especially on Engineering Thermodynamics and Heat Transfer while being involved with a prestigious institution like KEC. He has presented a number of technical papers in various international conferences. He is member of Nepal Engineering Council (NEC) and Nepal Engineers Association (NEA). He has been decorated from "Mahendra Bidhya Bhusan Ka".



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Status of Wind Resource Assessment and challenges for Nepal's Wind Energy sector



-Er. Abhinab Kadel

1. Introduction

Energy access and energy supply are one of the major development indicators of a country. In accordance with SDG-7: *Affordable and Clean Energy*¹, the Government of Nepal has set an enterprising target of producing 15,000 MW² of electricity by 2030 [1]. Significant increase in electricity production is required to meet this goal.

1.1. Power Scenario in Nepal

Nepal's current generation capacity is 1,074 MW [2]. There are 2,071 MW worth projects under construction, while generation license application has been filed for another 5,465 MW [3]. Furthermore, grid-connected PV³ plants worth 317 MW have received survey licenses [4]. With the planned and current projects clearly insufficient to meet the 2030 target, it is vital to explore other energy sources, such as wind power.

1.2. Wind power in global energy scenario

The installation capacity of wind power has increased by 23.6% between 1990 and 2016, second only to solar PV [5]. It is the most prevalent form of renewable energy, after hydropower (see Figure 1). China, the United States and Germany were the three largest wind energy markets in 2017, with new installations of 19.7 GW, 7 GW and 6.1 GW respectively [6]. In contrast, Nepal is a neophyte in wind energy. The first significant event was in 1989, where two 10 KW wind turbines were installed in Kagbeni, Mustang. However, they were damaged within three months of installation [7]. Since then, there have been two KW-scale installations: Sindhuli (10 KW) and Nawalparasi (20 KW) [8]. They are both part of solar-wind hybrid mini-grid system. The government has emphasized on such hybrid projects, but there hasn't been enough interest for grid-connected wind power.

1 United Nations Sustainable Development Goals (SDG)

2 W (Watt) is the unit of power. A typical LED bulb used in houses is below 15 W.

1 KW = 1000 W, 1 MW = 1000 KW, 1GW = 1000 MW

3 Photovoltaic (PV) plants convert energy from sunlight into electrical energy

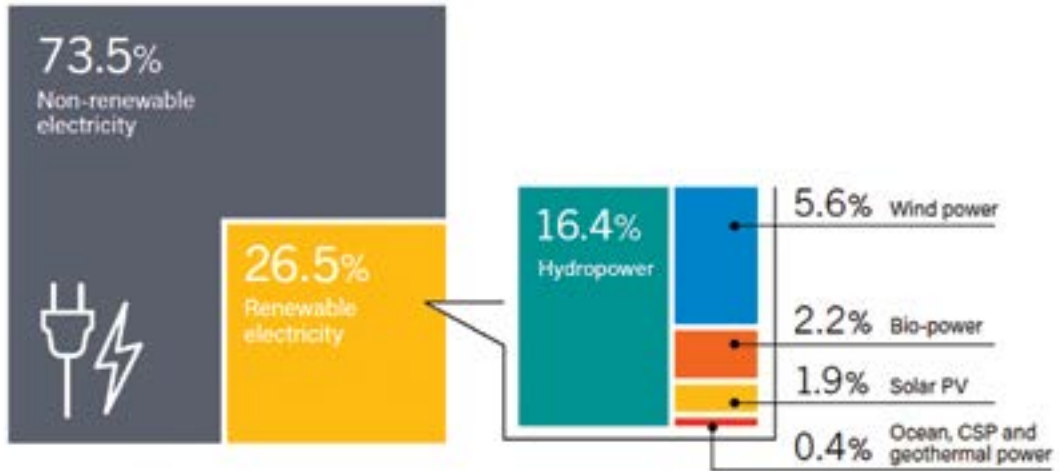


Figure 1: Share of different energy sources in global electricity consumption (Source: [6] pg. 41)

2. Wind energy basics



Figure 2: Schematic showing basic energy conversion steps and the respective components involved in harnessing wind energy.

Wind is the movement of air particles on a large scale in the atmosphere. At suitable speeds, the energy carried by winds can be harnessed and converted into electrical energy. Figure 2 illustrates the primary steps involved in wind energy generation. The power from a wind turbine increases cubically with wind speed, making it the most important factor. For Nepal, the first step to upscale the wind energy sector will be to have reliable wind data. A *wind resource assessment* involves measuring wind speed and direction at specific time intervals (normally 10 minutes), across different heights. It will help policy makers identify and prioritize areas with high wind power density.

The article aims to highlight the present status of wind resource assessment in Nepal. The challenges relevant to Nepal in each of the development stage of wind power: resource assessment, design and construction, and grid connection are discussed. The article focuses solely on grid connected onshore wind turbines. Throughout the article, a feasible site will refer to site with good wind resources.

3. Wind resource assessment in Nepal

According to Department of Hydrology and Meteorology, Nepal has 99 weather stations that can measure wind data. However, they are not uniformly stationed, and they are not always located in the location where a wind turbine is desired. Furthermore, the smallest temporal resolution of data from these stations is hourly, which is not sufficient for a detailed design of a wind energy system. As such, a nationwide wind resource assessment is needed. The first and the only nationwide assessment for Nepal was done between 2003 and 2007 through the Solar and Wind Resource Assessment (SWERA) project [9]. SWERA covered areas up to 15 km from the national transmission grid, with a resolution of 5 km. This limited spatial coverage of SWERA data is reflected in Figure 3.

SWERA data can be compared with the Global Wind Atlas (GWA), which maps the wind resources of the world. GWA has a spatial resolution of 250 m. The data is calculated using meso scale and micro scale models, followed by validation with ground measurement data, where available [10]. GWA shows feasible areas of northern Nepal that are missing in SWERA map. Despite nationwide coverage and good spatial resolution, the rugged terrain and lack of verification with ground-based stations in Nepal results in high uncertainty in GWA data.

At present, WindPower Nepal has initiated wind energy mapping for Nepal as a part of an ESMAP project. It plans to install masts between 10-50 m heights at different locations. The ground-based data will be used to complement the existing weather models. This should provide a better reflection of the wind resources of Nepal and minimize the uncertainty that was present in GWA⁴.

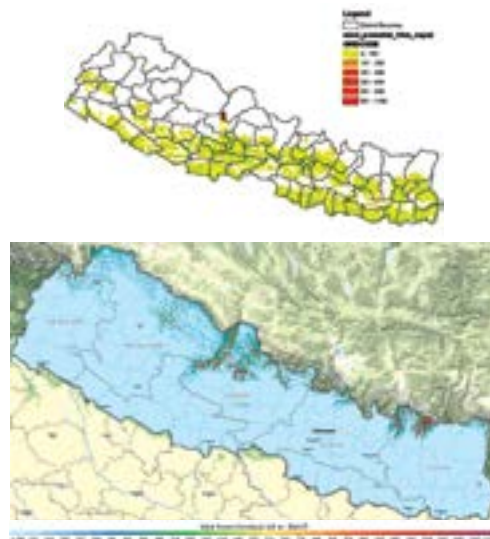


Figure 3: Distinction between wind power density maps of Nepal from SWERA (top) and Global Wind Atlas (bottom). SWERA covered only a small portion of the high wind density regions of Nepal. The high wind power density areas shown in red in the bottom figure are the most feasible areas in Nepal. (Source: [10], [9])

⁴ <https://globalwindatlas.info>

4. Challenges for Nepal

The major challenges in mainstream adoption of wind energy for Nepal will be financial and infrastructural. Identification of feasible sites require multiple measurement equipment (such as LIDAR, anemometers) and relevant support structures such as masts spread across Nepal. Although Nepal has feasible sites in the northern areas (red regions in Figure 3), the road access is limited or poor. The narrow, serpentine roads without asphalt, allow only small turbines to be carried. Thus, airlifting is the only option for large wind turbines, which adds to the initial investment costs. Furthermore, most of the feasible areas of northern Nepal lie within the protected areas (see Figure 4). Detailed study on impacts of construction process (including wind measurement, road extension, transport of parts and grid extension) on the biodiversity is needed before proceeding in these areas.

$$\text{LCOE} = \frac{\text{Expenses throughout lifetime}}{\text{Electricity generation throughout lifetime}}$$

Levelized Cost of Electricity (LCOE) is the price per kWh required for breakeven of a project throughout its lifetime. A developer can expect return on his investment only if the feed-in tariff is greater than the LCOE. In 2018, the LCOE of wind power in the world ranged from 4 to 10 \$cents /kWh (NRs. 4.50 – 11.10). Nepal's neighboring country India has the average LCOE of 6.2 \$cents/kWh (NRs.6.90), with the maximum and minimum being 7 \$cents/kWh and 4 \$cents/kWh respectively [11]. India has most of its wind farms in the favorable terrain of the southern states. Unlike Nepal, it has in-house turbine manufacturing companies, good transportation access and large-scale wind installations. Nepal might need to rely on foreign expertise during the early years. Thus, the LCOE in Nepal will be higher. The Nepali utility should be prepared to offer generous feed-in tariff to the future developers of wind energy.

Finally, wind is a variable resource. Unless storage technologies such as batteries are adopted, the production will vary throughout the day. Accordingly, the grid will be under/over supplied. At present, Nepal has been dealing with under-supply by importing electricity from India at a higher rate. In the future, storage systems such as batteries, pump-hydro or storage-based hydro can be used. Conversely, during over-supply, it is common to disconnect the turbine from the grid. This process (called curtailment) is a concern for developers as it leads in energy and thus financial loss. Mechanisms to minimize curtailment or to compensate the developers should be institutionalized.

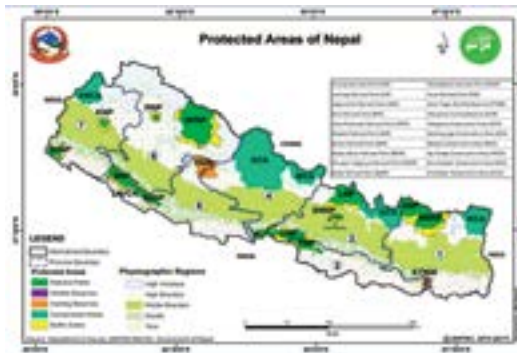


Figure 4: Map showing the protected areas of Nepal. (Source: [12])

5. Conclusion

Wind energy is gaining widespread popularity in the world, and it could be a useful source to produce 15,000 MW by 2030. Reliable wind resource assessment should be the prime target of Nepal at present. The major challenges in each of the wind energy design phases: resource estimation, design and construction and grid connection are discussed.

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Author's Introduction

Author is a graduate of Engineering Physics (B.Eng.) with focus in Renewable Energies from the Carl von Ossietzky University of Oldenburg. He has keen interest in renewable energies. He is currently involved in Sirjanshil Urja Company Pvt. Ltd., where he oversees the technical decision-making of the company.

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Dual Vocational Education : Possibilities of transferring successful education and training principles



-Dipl.- Ing. Pawan Dhakal

Background

Nepal is lagging with the practical education since her history. The Nepalese youth have only a choice of getting the conventional education at colleges and universities. At one side these conventional education at colleges and universities are getting more commercialized and becoming a day dream for majority of Nepal's poor population (over 25% Population) who are living under the national poverty line. On the other hand, not each and every one can manage to go to the colleges and universities, and everyone will not eventually succeed in passing out of the colleges. There is no alternative practical education for those who don't manage to get the conventional education or pass out at college and university. The result is about 1500 to 1600 youths are leaving on daily basis either for an unskilled employment or for further education. In long term it is causing social issues as well as brain drain. However, both conventional and practical education system are equally important for the sustainable development of any country. Germany, one of the world strongest economy is one model example of such kind of education system, which is a backbone of Europe's strongest economy.

Nepal targeted to develop herself from underdeveloped country list to developing country till 2022 and is trying to attract foreign investments in several sectors including. hydropower. For this the Government of Nepal (GoN) has introduced several investment friendly rules and regulations. However, it seems that GoN is completely ignoring the fact that the development of skilled manpower is equally important as investment friendly rules and regulation in order to make the foreign investment possible within the country. De facto, the dual vocational education system can be a good solution for the modern Nepal with her sustainable development and industrialization. Germany with a long decade of experience with such system can be a reliable development partner for Nepal's future development with sharing the experience. German educated Nepali youth can contribute to understand and implement this model into Nepali context as they are able to understand both circumstances to replicate such system in our country.

Germany as a role model for dual vocational training education:

According to BIBB (Berufsbildungsbericht 2017) about 55.7% (1.34 Million youths) of Germany school graduates start dual vocational training in different 330 professions. This counts a total of Germany's 5.6% employees. After graduation almost 90% youth have a secured job in their learned professions. Each company invests in average about 15,000€ per year on each trainee, out of which 76% of investment amortised through the direct production involvement of apprentice. This results in a very strong and competitive German economy with very low (lower than 7%) unemployment rate among the youth.

In Germany the process of dual vocational training starts with signing a contract between trainee, partner industry and vocational training center. The learning phase is more than 70% during work at the industry under the supervision of a mentor, which will be at the end examined by an independent examination board, that is supported by the stakeholders to standardize maintaining a quality standard all over Germany.

The challenges/ barriers of implementing vocational education system in Nepal:

In Nepalese society, the vocational trainings do not entertain high social acceptance and status. So most of the youth hesitate to choose a way through dual vocational skill training for their future career path. The major challenges to implement this practical education system are as following:

- Change the people's mindset on vocational training and professionals within the Nepali society. Convincing the youth to take an education based on his individual capability.
- Convincing the importance and advantage of such kind of vocational and dual education system in Nepal
- Changing the mindset on youth to stay inside the country
- Financial aspects and the sustainability of the program
- Convincing the business community and industry sector to participate in such dual education system

The solutions:

- Introducing the dual (practical) education system in Nepal in cooperation with government of Nepal, FNCCI, Industries and other stake holders. This kind of dual education system is well established in the developed country like Germany as a backbone of their sustainable economic growth.
- Developing the vocational training center throughout Nepal and supporting the government agencies to develop the market relevant courses and contents of the course which shall mirror the international standards
- Initial cooperation with bi-& multi later donor securing the sustainability of this program
- Educate and aware the society and specially youth on changing the mindset on the importance and sustainability of such dual (practical) education system.
- Introducing the personal assessment system in the schools in cooperation with education ministry and recognizing the capabilities of each individual youth and recommending them to choose the suitable education for them.
- Introducing exchange program for the youth of Nepal on such vocational training with other peer group throughout the world to better understand the importance and sustainability of such education



Picture 1: Model- The Dual system under one roof

Role of German educated Nepali professionals:

German educated professionals can play a vital role to bring the education model which they have learned and seen in Germany to Nepal in Nepali context. They can act as a bridge to gap the knowledge and also bring the cultural changes in Nepal to make it highly accepted in Nepali society. Besides that, they can create a platform and knowledge base network, share knowledge and transfer knowledge including supporting the Nepal Government in policy making. Further they can also act as brain gain showing the ways of best practices.



Picture 2 : Role of German Educated Professionals

What has to be done next?

All the stakeholders including society shall play a positive role in developing a respect culture for such hand work trainings and consulting the youth towards it. The society can also play a critical role in monitoring and promoting the dual vocational education organizing different awareness activities in the society. The industry should take such kind of dual education as a chance to train the youth and secure the skilled youth workforce as a strategic business development policy. The industry in Nepal shall work together with government agencies and accept the scientific payroll for trainees. As seen in Germany the amortisation of such investment is possible during the practical placement at industry directly in the operating daily business.

Also in the part of Nepal government lot of things has to be done including preparing a legal framework to establish dual vocational training as a part of education system in Nepal including restructuring of CTEVT (Council for Technical Education and Vocational Training) to include the concerned stakeholder and make it accepted among them. The main role of the government shall be creating a favourable environment to work together with local government, industries, chambers and international institutions. The government can utilize the NRNA fellow expertise and German educated professionals and experiences bringing all within a legal framework. Research and development of vocational training including best practices is one of the vital roles of the government, where the professionals can play a significant role towards it.

This will eventually help to realize the targeted foreign investment, industrialization within the country creating a strong economic growth where skilled youth are retained within the country for a sustainable and strong economic growth. Even in foreign employment case, the youth will be able to enjoy respectable jobs and payrolls.

Author's Introduction

Dipl.- Ing., MBA Pawan Dhakal is living in Germany since last 20 years. He is currently working as Director Sales and Marketing Asia for an Austrian based Hydropower equipment manufacturer, Geppert Hydropower. He is Aerospace Engineering Graduate from the University of Bremen. Additional to that he has completed executive MBA from the University of Osnabrueck, Germany and Buckinghamshire New University, UK. After completing his education in Aerospace engineering, he worked for Europe based Aircraft manufacturer Airbus in Bremen for several years. After that he worked for European Hydropower Equipment Manufacturer Voith Hydro (A joint Venture company between Germany origin Voith and Siemens) from 2008 to 2018 in different leading roles at it cooperate office in Heidenheim Germany. Since last few years, Mr. Dhakal has initiated a social project to build up a pilot dual vocational training center in Dhading while bringing support from German Government, foreign industries and Europe based different organizations. The centre aims to promote a dual education in Metal works, carpentry and hydropower maintenance and operation trainings, a model similar to German Vocational Education model but in Nepali context. He is also a conveyer of Skill Training Center Committee in NRNA central.

Connecting Germany for technological infusion in Nepal



- Col. Er. Budha Bahadur Shakya

Germany attachment

Although I was born in Pokhara, one of the most beautiful cities of Nepal, I grew up in Kalimpong a small town in north Bengal. We didn't have electricity in our home in those early days of my childhood. My granddad used to light petromax in the night time. In fact it was this petromax which made me acquainted with the name of a country called Germany. The petromax was made in Germany. My granddad was proud to have owned it and used to say that German products are very robust.

It was in 1978 that I saw black and white television for the first time. Some rich neighbors in our locality brought black and white televisions in our locality. In the night time we used to go to those houses to watch television programs. A few months later FIFA world cup started and world cup games became our favorite shows in television. Maradona was the talk of the town but he could not continue in that tournament because of red card he got due to foul play. But it was the semi final match between Germany and France which was decided in extra time; especially the look of German goalkeeper which attracted me the most. I still remember German goalkeeper's attractive long curly hair. I think Italy won that world cup because of Paulo Russo. This was my second encounter with the name Germany in my life.

In my college days I used to watch a lot of tennis in television whereby I came to know about two famous German tennis players Boris Becker and Steffi Graff. Both were blonde and I had started building up imagination about look of German people. Alberts Einstein's $E=mc^2$ equation was another topic which connected my mind with Germany. I had begun to know that Germany is a country of scientists and researchers. During our university days we used to travel everyday to university on old Mercedes micro buses. "Vehicle from Germany, Road built by China" used to be one of the most popular songs in those days. Later I came to know that Germany has other auto brands too like Volkswagen, Audi, BMW.

It was first in 1990, when I physically landed in Germany for my engineering study, I really got confronted with technological advancement and development of Germany. For the first few months after my arrival in Germany everything astonished me. It started from Lufthansa business class travel, Frankfurt Airport, Language learning

center in Hurth to later University itself in Hamburg. It is a sad fact that 25 years have passed since I came back from Germany and still none of colleges or universities in Nepal has achieved that standard of university infrastructure which I saw and experienced in Germany.

After completing engineering study I came back to Nepal and served in army for almost 22 years. During my service in army I got opportunity to work in a German built factory in Nepal. It was built almost 30 years ago when most of the Nepalese people were deprived of any technological know-how of the outer world. Only few people who had opportunities to travel outside Nepal had seen such technological marvels. The factory I worked was a German propellant factory where everything from nuts to big machines were from Germany, installed and run by German technicians. In fact all the big defense related factories of Nepalese Army are of German origin. I am impressed by their precision, reliability, robustness and thoughtfulness for maintenance.

After having talked and praised so much about Germany it is sad to know that of the top 20 multinational companies in Nepal none of the German companies are in the list may be because Nepalese market is not big enough for them. Presently 20 Top Multinational Companies in Nepal are Unilever Nepal, Dabur Nepal, Nepal Battery (Union Carbide), Coca-Cola, Pepsi, Crown Plaza, L.G. Television, Tuborg Beer, Jenson and Nicholson Paint, Wai Wai Noodles (CG Group), Nepal Arab Bank (Nabil Bank), Radisson Hotel, Standard Chartered Bank, Himalayan Bank, Nepal SBI Bank, RED BULL, San Miguel Beer, Surya Tobacco (ITC Ltd.), Life Insurance Corporation Nepal. [1] All these companies might have been using German machines, instruments, equipment or German technological know-how in some way other but we have not seen direct involvement of big German companies in Nepal in a big scale. Even in the upcoming investment summit in Nepal, participation by German entrepreneurs and business houses are comparatively less.

Aspects of Nepal German Relation

Germany began its development cooperation to Nepal in 1961 with the technical assistance for the establishment of a Technical Training Institute at Thapathali. In 1964, it provided soft loans to Nepal Industrial Development Cooperation (NIDC). In the years to follow, Germany supported Nepal in the fields of power generation, agriculture, town development, preservation of monuments and temples, tourism, education and culture, solid waste management, promotion of small business projects, etc. [2] There are also more than 120 private initiatives and associations from Germany supporting projects and programmes in Nepal, in some cases with public funding. [2]

The most notable financial assistance from Germany for a single project has been that of DM 250 million for Middle Marsyangdi Hydroelectric Project. It is a daily poundage run-of-river scheme with an installed capacity of 70 MW and an average annual energy generation of 398 GWh. This Project was funded by KfW (Germany), Government of Nepal and the Nepal Electricity Authority. The estimated cost of the Project is about 13.65 billion rupees. [2]

Germany is Nepal's third largest trading partner after India and the US, and the biggest export market for Nepali products in Europe. Germany is an important market for Nepal, particularly for carpets and textile products. In recent years, the bilateral balance of trade has regularly shown a surplus in Nepal's favor. Besides carpet, export to Germany from Nepal include handicraft, silver jewellery, garments, leather, wooden and bamboo

goods, lentils, tea, essential oils from herb and aromatic plants. Nepal imports mainly industrial raw materials, chemicals, machinery equipment and parts, electric and electronic goods, vehicles etc. from Germany. [2]

Nepal is also a priority country for the German Research Foundation (DFG) with more than 40 research projects operated in Nepal so far, including a major project by the University of Hamburg to catalogue some 160,000 Nepalese (Tibetan and Newari) manuscripts, which were able to be microfilmed with German support between 1970 and 2002. [2]

Germany's Federal Foreign Office has funded projects to restore sites of cultural or religious significance in Nepal, including in the cities of Patan and Bhaktapur in the Kathmandu Valley. [2]

Latest Technology Trends in Nepal

When the world is experiencing augmented reality & playing with IOTs & other latest technology trends, Nepal is still behind many steps. We have just started to grow online. However, there are people in Nepal who are updated with all the latest Technology trends but the sad truth is maximum of people are still limited to Social Media Networks. Be it in the field of education, health, transportation, communication or entertainment; technology has really changed the course of our life. It has not only made our lives easier by saving a ton of time but it has entirely changed our living style, choice, preferences & hobbies. [3] The latest technology trends in context of Nepal include: [3] E-commerce, Internet Broadband, Digital Wallet, Online Ride Sharing, Electronic Gadgets, Gaming, Online Business, Electric Vehicles, Robotics, Artificial Intelligence

Germany could be a good destination for our young students who want to learn and deepen their knowledge in the latest technological fields mentioned above. German universities should also organize education fairs to make students aware of higher educational opportunities in Germany.

Business Opportunities in Nepal

Nepal lies between two of the fastest growing economies of the world, India and China. As a least developed country, Nepal is entitled to preferential treatment in a number of rich markets. Two other advantages, according to investors already in Nepal, are a low-cost and non-hostile workforce and a small and accessible bureaucracy. [4]

There is huge potential for hydropower. About 44,000 MW is thought to be economically feasible, which may be contrasted with about 800 MW currently being generated. In order to harness and develop hydropower, the government is encouraging private foreign investment in this sector. This priority sector provides great opportunities for contractors, equipment suppliers, and consultants alike. [4]

Tourism is another area with enormous potential. Nepal has spectacular natural assets such as Mount Everest the Top of the world - and seven other peaks of 8,000 meters and higher. Tremendous opportunities exist in developing tourism/hotel projects and resorts in Nepal.[4]

Other trade opportunities include telecommunications equipment, ICT equipment, water resources equipment, and aircraft parts. The major telecom players are in expansive mode. Other upcoming opportunities also include civil aviation infrastructure, toll fast track roads, and railways. [4]

Other areas like software development; leather and textile; pharmaceutical; electronic and the service Industries also carry high possibilities of foreign investment. Other sectors such as medicinal and aromatic herbs; flower and vegetable seeds; floriculture and sericulture; processing of spices, coffee; fruits and dairy products; vegetable and mushroom farming and tea, also carry high possibilities of foreign investment. Minerals that includes stone and limestone; talc; silica; dolomite; Iron-ore; oil and natural gas needs to be further explored. [4]

Opportunity for strengthening Nepal German bonding

After having talked so much about latest technological trends and business opportunities in Nepal, one can find out which German companies could be beneficial for technological transfusion to Nepal. German business communities should also be made aware of such opportunities prevailing in Nepal. German business and technological fairs can be useful for Nepali entrepreneurs. Coming German technology in Nepal will not only provide exposures to Nepali business communities but will also help to enhance quality of our industry.

Conclusion

Every Nepali citizen has a very positive perception about Germany, its people, its industry and its product. Concerned authorities and organizations should try to brainstorm and find out new ways to strengthen the bonding in various sectors. Nepal is in desperate situation to find out ways for development and prosperity of the country, which is possible only through introducing quality in every aspect of our country. Germany could be a pivotal country for the development and enhancement of quality infrastructure in Nepal through infusion of technological know how.

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Author's Introduction

Colonel Buddha Bahadur Shakya served the Nepalese Army for over 26 years as Electrical Maintenance In-Charge, Account-, Production- and Factory-in-Charge at Swayambhu Barood Khana under Directorate of Defense Production. He acquired his Masters in Electrical Power Engineering from University of Federal Armed Forces Hamburg, Germany. He also acquired his MBA in Finance from Kathmandu University School of Management (KUSOM), and worked as Visiting Faculty for Management of Operation and Technology at KUSOM. He was also the Chief Instructor for the Training Course "Explosive Production Technology". He participated in the UN Mission to Congo, Lebanon and Sudan as Military Expert of Nepalese Army Battalion. He is the life Member of NEGAAS.

Nepal's Participation in 3rd DAAD International Meeting: An Experience



- Surendra Dhakal
Immediate Past President

Background

German Academic Exchange Service (Deutscher Akademischer Austauschdienst/ DAAD) grants scholarships for higher education and research worldwide and invites students to help promote themselves in German Universities. They also encourage the graduates to use the gained knowledge and skill in the development of their respective nations.

DAAD believes that the former scholarship holders are the catalysts in their respective countries. They can contribute significantly in socio-economic development of their countries. For this reason, DAAD desires to see such groups united under DAAD Alumni Association in their respective countries and linked at regional and global level and exchange their success stories through effective networking, constant touch and fruitful interaction. This is why DAAD has been organizing meetings of its alumni regularly.

This year, DAAD organized a meeting from 7 to 10 March 2019 in Bonn. It was the 3rd International Meeting participated by 88 former scholarship holders from 52 countries. The participants from various countries were divided into different groups allowing fruitful and effective interactions on various issues like exchange of success stories, interaction and possible networking in future. The exchange of experiences was facilitated through parallel workshops on Project Management, Event Management, Networking and Strategy as well as Methods of Fund Raising. Each interaction session was led by an expert in the particular subject for effective discussion.

Nepal's Participation

Nepal was invited for the first time in the event this year. Nepal German Academic Association (NEGAAS) was selected from Nepal as one of the alumni associations active in the country. I as the Immediate Past President and Mr. Rupesh Shrestha as current Secretary of NEGAAS were invited to represent Nepal in the meeting. Bangladesh, China, Indonesia, Japan, Myanmar and Vietnam were the other countries, which participated in the gathering this year Asia Pacific region.

Experience Sharing

NEGAAS shared following points to the participants of Asia Pasific Region:

1. NEGAAS as an alumni association of DAAD, DSE, CDG, SPRING and so on has been active continuously for last three decades.
2. Change of Leadership unanimously every two to four years.
3. NEGAAS is registered under Institutional Registration Act of Government of Nepal and renews its registration with district governmental authority and Tax Office every year.
4. NEGAAS organizes Annual General Meeting and Strategic Planning workshop every year and bring out News bulletin/professional Journal and updates its website and list of its members regularly.
5. NEGAAS organizes Breakfast Meeting every month attended by its Executive Board and Life Members. In the meeting, classified talks led by individual members on their field of expertise are encouraged so that every member knows about the other member and his/her contribution to the socio-economic development of the country.
6. Almost every year NEGAAS organizes seminar/workshop/colloquium on topical issues by inviting professor from German and Nepalese universities. Such programmes are financed by DAAD.
7. NEGAAS raises fund regularly through membership drive, organizing social events, hosting monthly meeting and collecting sunshine donations from members, selling journal and lapel pin advertisement collection from business communities for NEGAAS Journal and registration fees from the participants attending various events organized by NEGAAS.



Handing over publication materials and token of appreciation to Dr. Dorothea Rüländ (Secretary General of DAAD)

Moreover, both in plenary and breakaway session NEGAAS journal was distributed to the participants from Asia and Pasific Region and packets of Nepal Tea as gift were presented to DAAD Secretary General and DAAD officials. NEGAAS displayed its posters depicting its activities in the lobby and they were very much appreciated.

Lesson learned

In the plenary session, only the participants from Sudan and Armenia presented their activities. No DAAD Alumni Associations worldwide except NEGAAS has been found to have published any journal and maintained their websites regularly. Many of them do not even have office and activities like those of NEGAAS on regular basis. NEGAAS was very much appreciated by the participants during plenary and breakaway sessions.

At the end NEGAAS forwarded a concept of creating a Regional DAAD Alumni Association for Asia and Pasific within coming months, which was endorsed by DAAD.

Author's Introduction

Mr. Surendra Dhakal is immediate past president (2016-18) of NEGAAS and has specialization in management and administration. Mr. Dhakal served as Executive Advisor/CEO for Nepal Carpet Exporters' Association from 1999-2012. He is President of Surendra Dhakal Foundation through which he conducts philanthropic works. Mr. Dhakal is an active Rotarian and has implemented multiple development projects in Nepal. He has led multiple delegations abroad as Rotarian and management expert.



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Pvt. Ltd.

Contact:

Abhinab Kadel (*B.Eng. Engineering Physics*)
01-4288521, 9864474009
sirjanshilurja@gmail.com



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INTERVIEW WITH PROF. DR.- Ing. RAMESH KUMAR MASKEY



- Prof. Dr. Ramesh K. Maskey

(Interviewer: Er. Sandhya Regmi, Date of Interview: June 2019)

This interview—taken exclusively for publication in the NEGAAS's Professional Journal 2019—attempts to record NEGAAS's President Professor Ramesh Kumar Maskey's views and suggestions on matters related to NEGAAS, Nepal-German relationship, Kathmandu University, S&T, and ways for Nepal's prosperity. The interview was taken in June 2019 by Er. Sandhya Regmi, the Vice-President of NEGAAS.

- 1) ***Originating from Eastern Nepal's Morang district and starting your career as a technician, Professor Maskey, you have marched a long way forward in your career path—establishing yourself as a distinguished professor of the prestigious KU, and serving in high level seats in S&T and administration with over three decades' professional experience in leading organizations as a researcher, development catalyst and consultant. Considering that your contributions seem to have been largely confined in Kathmandu and that its main beneficiaries constitute only a selected privileged section of our society, how do you relate your contribution for the development of Nepal's rural areas and deprived sectors?***

Despite the fact that I was largely confined in Kathmandu working in NEA, consulting firms, and teaching at Institute of Engineering (IOE), most of the time I was engaged in Nepal's hydropower sector. As a part of Swiss Development Cooperation (SDC) back in 1989, I used to travel a lot from eastern to western hilly and mountainous parts of Nepal for study of existing and new sites for different types bridges. Based on the study, several bridges were constructed latter. That was one of my major contributions to Nepal's deprived rural community.

Since 2006, I am a professor at KU. I started Bachelor of Engineering (BE) in Geomatics Engineering in 2007 and Civil Engineering in 2009 and established the Department of Civil and Geomatics Engineering. I was also instrumental in initiating BE in Chemical Engineering in 2015 and Bachelor in Architecture in 2017 at KU. Many engineering graduates whom I taught and supervised are now contributing to various levels in Nepal's development. Through R&D at KU, I also innovated technology to produce electricity from existing watermills in several villages of Nepal. As a President of NEGAAS, I also aim to reaching out to community with all of our dedicated works for the betterment of Nepali people.

- 2) ***Nepali scientists like Dr. Sanduk Ruit and Mahabir Pun have played model role in serving the global community with their breakthroughs in S&T, benefitting rural communities and under-privileged sectors, and setting higher benchmarks of innovation for our future generation. Considering this as a focal point, what would be your three messages to Nepali youths for their contribution in achieving Sustainable Development Goals (SDG) for the prosperity of Nepal through development in S&T with equal opportunities to all?***

My hats off for both of them for their role-model works in inspiring and benefitting rural and under-privileged people. My three messages to Nepali youth would be:

- a. **Study in Nepal:** After completing bachelor study in Nepal you can embark for other countries of destination. You should dedicate at least two years in Nepal to gain experience first. That experience will support your innovative ideas for Master degree and beyond.
 - b. **Do for Nepal:** Wherever you are you, always think of sustainable development of Nepal and do something tangible, whether you contribute through brain circulation or through financing.
 - c. **Be in Nepal:** Whatever you do in your life, be it research work or development work, do consistently making things in Nepal.
- 3) ***Nepal has for the first time in its history constructed its own satellite—in a joint collaboration of NAST's scientists and those of the Kyutech University, Japan—which was deployed on 17th June 2019. As an expert in S&T, could you shed some light on the resources and technicalities involved in achieving this milestone, and whether or to which extent Nepal is capable of maintaining and operating the satellite on its own? Please highlight if and how this satellite could help our nation in mitigating natural disasters and accelerating development requirements. What will it take for Nepal to be economically and technically capable to upgrade or launch larger satellites on its own in future?***

The NepaliSat-1 under the BIRDS-3 program will remain at Low Earth Orbit around 400 km in the space for three years. It was deployed by Kibo lab of International Space Station (ISS) at 16:00 Monday on 17th June 2019. Its dimension is 10 cm³ and weighs 1.3 kg. The Government of Nepal provided the fund. It has the following four missions on board:

- a. **LoRa Demonstration Mission:** A low-powered, long-range new communication system for uplink and downlink of command to be used for Store and Forward Missions.
- b. **Imaging Mission:** An onboard camera with 5 megapixels for remote sensing that captures photographs of the earth's landscapes.
- c. **Software Configured Backplane Mission:** A new software configured flexible backplane board program for reroute connection and computer process management installed to be tested on board.
- d. **Attitude Determination and Control Mission:** Uplink command can control the attitude for stabilizing and orientation of the satellite for pointing to objects.

The satellite commenced successfully all four missions on top of the Beacons it sent immediately after the deployment from space as planned. This paved another milestone in designing and developing better satellites. In future, this tiny satellite could be scaled up for commercial missions such as observing natural disasters, GLOF, soil condition, weather condition, communication etc., which could be beneficial for various purposes. For this we may need many qualified people in Aerospace Engineering capable in building Satellites in Nepal.

- 4) ***How should Nepal promote young scientists and scholars for new discoveries and innovations? Do you see Nepal's scientists and scholars tall enough to compete for Nobel Prize? What will it take for our scientists and scholars to realize the national dream of winning Nobel Prize, in terms of ground work, commitment, investment and collaboration at individual, institutional and government levels?***

I strongly believe on the capacity of our scientists and scholars for research in fundamentals of science, develop technology and innovate, if provided fund for R&D and ensured conducive environment. Provided opportunities, Nepali scholars can excel in science, technology, and innovation (STI). So far, the STI has not been a top priority in Nepal. We should also have more science-focused education systems in schools. We need to continue teaching of our new generation through guiding, supervising, and inspiring them for innovation in fundamentals of S&T. We should apply the knowledge gained from STI for sustainable development of Nepal. The new National Policy on STI 2076 is to prioritize our economic development stages based on science and technology. It stresses on increasing the GERD (Gross Expenditure in Research and Development) to more than 1% of our GDP. Let's have more funds provided for R&D, reverse the drained brain and establish a culture of home grown scientific research and innovation for industrialization, then we will certainly reach out to the Noble Prize someday.

- 5) ***Cross-border migration has been viewed as a double-edged sword. On one hand, migration has been imparting revolutionary economic impact, bringing inward remittance amounting to one-third of Nepal's annual GDP (which is more than 50% of country's annual budget). On the other hand, it is seen as a source of undue deaths, injuries, abuses, social disorders, and scarcity of workers at home. Do migration benefits outweigh the risks? How do you view brain drain versus brain gain? What approaches should be undertaken to reverse the brain-drain syndrome without compromising nation's economic gain through remittance?***

In the cross-border migration, short-term gain through remittances may be attractive though most of the remittances now are being drained on consumables of foreign products. Moreover, cross-border migrants will invest their hard-earned money in the countries of destination. There will be no remittance coming to Nepal, but the reverse may happen in the long-run. The end scenario would be a brain drain again. Not only the unskilled people but also skill-full and knowledgeable people will be migrating.

Most Diasporas show their willingness to return home, if a conducive environment is guaranteed. The newly drafted STI policy 2076 adequately addresses to attract the drained brain. Nepal government should provide them honor and a good opportunity to work in their own country. We have to be pragmatic in reversing the drained brain. Even if they wish to stay in the country of destination, they could still be contributing by virtue of 'Brain Circulation', which is gaining the drained-brain by exchanging the

“equivalent experts” within the like-minded people. In 'Brain Circulation', Nepalese Diasporas do not have to quite their workplace in countries of residence completely. They can still be contributing through collaboration with foreign and Nepalese experts to develop projects and do some impactful things in the country of origin. The experts from both countries can exchange for a duration acceptable. This is a doable idea. Many having the equivalent knowledge are already collaborating in this way. They return their respective countries with more enthusiasm and satisfaction on what they achieved for their motherland.

- 6) ***In this age of globalization, Nepalese scholars have excelled in world's top education institutions and have performed outstandingly while serving in multinational and international entities. Nepali workers have constructed star complexes in the gulf countries, are considered as the most trusted security guards worldwide. Nepal's literacy rate is growing higher each day and IT is rapidly penetrating even the most remote corners of Nepal. Prominent aspirations and future plans include developing Kathmandu into smart city like Singapore with scientific roads and green transportation, operation of international airports in Bhairahawa and Pokhara, construction of Kathmandu-Terai fast track, development of hydropower, and promotion of Nepal as a tourist hub. Based on these observations and facts, what picture of Nepal's development comes in your eyes after 20 years from now? Besides devastating natural calamities, what do you view as key bottlenecks in Nepal's aspiration to be a prosperous country?***

I fully agree that in the age of globalization, Nepalese scholars performed outstandingly in a conducive environment.

Based on the observation and facts that Nepal aspires its economic development through the construction of infrastructures and promotion of Nepal as a tourist hub, I believe that Nepal will achieve its goal of “Prosperous Nepal: Happy Nepali” after 20 years from now. We already have overcome political revolution and now it is the time for economic revolution. If we ought to have a visible impact from thinking to implementing consistently and continuously, then we could achieve higher Human Development Index (HDI). Besides the devastating natural calamities, the outstanding bottlenecks could be (a) to enhance adaptation capability to cope with the climate change, (b) to face political instability due to resources allocation and management, and (c) to redistribute political power down to the local governance.

- 7) ***Please specify three most important lessons our nation has learnt from the devastating quake and aftershocks of April-May, 2015, which should serve as new-found enlightenment for the nation's rebuilding. Where do we stand in terms of standardizing building codes and implementing them in constructing country's physical infrastructures?***

The three most important lessons are:

- a) **Ready for adversity:** We have to be ready for any kind of devastation, we have to be prepared technically so that we can be fit in adversities.
- b) **Build Back Better:** We have to be capable in building back better, revising the Codes not only for urban areas but also for rural areas, because life is the same everywhere.

c) **Memory Matters:** We have short memories. We tend to forget things quickly. We need to make ourselves alert. We should research and ink our memories about the disasters we face and get prepared to cope with them.

The standard building codes are available but they are inadequate for implementing in construction of larger physical infrastructures. The construction industries are also rapidly being modified and the methods of construction are being changed. Therefore, these standard should be revised periodically. The revision could be done by professional organizations like Nepal Engineers Association in collaboration with governmental line ministries as well as the relative departments.

8) *As an Hydropower expert and the Founding President of Water and Energy Consultant's Association (WECAN), what do you consider are the key issues to be addressed in Nepal's aspiration to realize its full hydropower potential?*

Well, we need to invest more in hydropower. We have a high potential for its development. The Nepalese government announced "Nepal ko pani janata ko lagani" (literally, "Nepal's Water—People's investment.") for encouraging Nepalese people for investing in the hydropower sector. Our hard-earned money better be invested in infrastructures where immediate return on investment is possible. This money should be going for the welfare of the Nepalese people and not to be drained outside.

I give two examples of utilization of Foreign Money vs Nepali Money for hydropower development: Arun 3 HEP (402 MW) was completely funded by foreign donors and lenders with a very nominal interest rate. Because of its conditions, almost 80% of the investment went back to foreign countries and only 20% of their money could be trickled down to Nepalese economy. In Upper Tamakoshi HEP (456 MW), out of our hard-earned money, 80% goes to foreign countries. And only 20% remains in Nepal. If it were 50%-50%, it could have been much better.

Therefore, I suggest that FDI should be attracted to mega size projects while small projects should be handled by Nepalese investors. Hydropower development is still cheaper. The larger chunk of work should be done by Nepalese hands and minds. Government should prepare the feasibility reports and then engage private sectors to implement the project on competitive basis. The concerned authority should ward out the delay in implementation of hydropower project through swift decision making.

9) *As an Advisor of Renewable Energy Technology (RET) Confederation Nepal, please compare the prominent options available in tapping Nepal's renewable energies and identify the most feasible technologies. What is the prospect of Nepal's realizing its wind power and geothermal potential?*

We should not be thinking about competition between hydropower or solar PV or wind. It is suggested to use renewable energy (RE) in an integrated way. Though the daily variation of solar energy is high, the solar PV system's cost is going down steadily. Renewable-based electrical energy for mobility should have the future to avoid air pollution. In a hybrid system, the best things from all RE sources can be achieved.

Energy should be clean and locally available. Making everybody independent of imported fossil-based energy should be our next approach. Our ancestors were far-sighted and very naturalists. They were using all renewable-based energy.

We do have a few prospects for wind and geothermal energy. Along Kaligandaki corridor, we have more than 200 MW of wind capacity. However, it needs larger turbines. The terrain is not conducive in bringing such big technology. There should be some kind of innovation in harnessing wind energy. Geothermal energy's potential is also high. It can be tapped from just a few meters below the earth. By placing the layer of water conduits 2-3 meter below the foundation, we can harness the geothermal in an effective way.

- 10) *Pointing on its rapidly melting Himalayas, and cross-border air pollution, Nepal considers itself as a victim of global/regional climate change. Besides, Nepal is suffering from its home grown pollutions in urban areas, deforestation, and illegal mining of earth materials. Many previously existing water sources are either discharging less or have gone dry, and many flora and fauna are declining or disappearing. What are the key points that Nepal need to consider in tackling the issue, while continuing its aspiration to be a prosperous country?***

We need to utilize RE, as far as possible, in individual houses, settlements, villages, and urban areas to reduce the air pollution and greenhouse gas emission into the atmosphere. Afforestation and conservation of available waterbodies are the key points to be considered. People will invariably mine the earth materials. As far as renewable and the river can sustain, they should be allowed to harvest. The sustainable use of natural resources should be the top priority.

- 11) *With its ever increasing academic, social, cultural and even diplomatic exchange and activities NEGAAS has excelled as the most vibrant entity among all the Alumni Associations of Nepalese academicians trained in Germany. What greater heights do you expect NEGAAS to achieve during your presidency? Please name six outstanding proposals NEGAAS aims to achieve during your leadership.***

I believe NEGAAS has a huge potential to achieve greater heights provided collaborative efforts of all members and its partners are materialized. In my tenure as the President of NEGAAS, I will not leave any stone unturned to seek solutions for harmonization in our collective endeavors for the goals we have set to achieve.

My six outstanding proposals are:

- a. **Collaboration and Cooperation:** Strengthen collaborative and cooperative relationships with like-minded organizations.
- b. **STI diplomacy:** Enhance academic, economic, and STI diplomacy.
- c. **Large Pool of Members:** Reach out to alumni from German Academic Institutions to increase the membership of NEGAAS. Unity in Diversity is our moto for sustainability.

- d. **Institutional Development:** Regularize the NEGAAS activities for establishing NEGAAS as a valuable institution for the society.
- e. **Transform** NEGAAS to become a trust: Increase financial capabilities of NEGAAS by regular implementation of seminars, conferences etc.
- f. **Establish** a fellowship/scholarship for needy students as well as a lifetime achievement award to recognize the outstanding contribution of Nepali academician and business person.

12) What are the three major weaknesses in NEGAAS, which, if overcome, could accelerate NEGAAS to its summit of success and popularity? What revolutionary strategies do you have in mind to apply in NEGAAS during your tenure to introduce historical U-turn by correcting those past weaknesses and enhancing its image? How do you see the need of amendment of NEGAAS's constitution to broaden its objectives of attaining greater heights by welcoming a pool of new scientists and academicians as its new members?

The three major weaknesses of NEGAAS are:

- a. Weak visibility of NEGAAS activities
- b. Weak participation of members
- c. Underestimation of NEGAAS's own potentiality as an institution

Revolutionary strategies:

- a. Activate all members to contribute to NEGAAS's goals, add new members.
- b. Use 'rocket-boosters' strategy for management rather than 'locomotive' strategy. Which is, in fact, "One for all and all for one" strategy. With this, NEGAAS's EC should be made a vibrant driving vehicle.
- c. NEGAAS must be a place of attraction for alumni from German Academic Institutions. For this to be materialized, certain amendments in NEGAAS's Constitution may be inevitable.

13) During your presidency NEGAAS signed MOU with the GZK (Goethe Zentrum Kathmandu) in the presence of the German Ambassador H.E. Roland Schaefer on Jan 14, 2019 with the main objective of promoting academic and cultural aspects of the two countries. Considering this as a gigantic step forward to further strengthen the German Nepal ties with synergy effect, please elaborate on how this collaboration could specifically create win-win situation to both the parties? How could NEGAAS collaborate with GZK to contribute on additional projects, apart from the German language and cultural training it has been imparting to hundreds of Nepali students each year?

The MOU between NEGAAS and GZK in the presence of the German Ambassador HE Roland Schaefer has been one of the major milestones of the collaborative partnership between like-minded organizations for win-win- situation for both parties. NEGAAS could collaborate with GZK briefly in the following ways:

- a. NEGAAS members may become members of GZK for active participation in GZK's development.
- b. GZK's partnership with NEGAAS could be beneficial in bringing new projects apart from language and cultural training such as Joint Seminar or Workshop for Nepali students to share experiences of NEGAAS members about the life and study in Germany.
- c. German scholars may be benefited from having Nepali scholars to develop joint projects.
- d. Perform activities that increases interaction and collaboration between NEGAAS members and GZK staff including its board members.
- e. Facilitate between German Organizations working in Nepal and Nepalese and German students to find internships, fieldworks & specialized projects.
- f. GZK and NEGAAS could share the same office venue for their day-to-day works.

14) What are the chances of NEGAAS signing MOU with the Cologne based GNFA (German Nepal Friendship Association) for mutual benefit? What do you consider are the common areas of collaboration between NEGAAS and GNFA? Apart from the annual cultural and diplomatic activities of GNFA in Germany and the occasional visits of the GNFA's President to Nepal for charity works, what could be NEGAAS's bolder suggestions to GNFA for further contribution and collaboration in supporting Nepal's socio-economic development activities, including in S&T and achieving the SDGs?

I see a good and beneficial chance of MOU between GNFA and NEGAAS. Several rounds of talks have been conducted with GNFA's President for sharing ways for collaboration and a few of them are:

- a. Members of GNFA could play a role for "Brain Circulation" between NEGAAS members and GNFA for SDG.
- b. GNFA could recommend new graduates from Germany to NEGGAS, those who are willing to comeback to Nepal and seeking support from GNFA. Similarly, NEGAAS could also recommend Nepali students embarking study and work in Germany to contact GNFA for further support.
- c. NEGAAS could be the first contact partner for students returning home for their networking in Nepal.

15) Under your leadership, the German Embassy's participation in NEGAAS's activities has increased significantly. Considering this conducive environment, how do you think NEGAAS should tap this opportunity for further cooperation between NEGAAS and the Embassy to foster Nepal German relations at a cultural, technical, and academic level?

There are a lot of prospects for collaboration between the German Embassy and NEGAAS to foster relations at various levels. The major activities to tap the opportunity for further cooperation are:

- a. Academic Diplomacy: For education, there should be collaboration between academicians and

institutions of both the countries through the DAAD, and other funding agencies like Humboldt, etc.

- b. Economic Diplomacy: NEGAAS should become a link between German and Nepali Commerce and Industries.
- c. STI Diplomacy: Transferring German STI for SDG in Nepal through various activities in collaboration with Nepal Academy of Science and Technology (NAST).
- d. Cultural Diplomacy: NEGAAS would be partners to organize cultural events in collaboration with GZK and other German Institutions active in Nepal.
- e. NEGAAS as a trustworthy Partner of German Embassy: NEGAAS could be trustfully consulted by German Embassy in case of need to perform certain works such as engaging NEGAAS in interview for scholarships and visa matter.

16) *What were the preparations of NEGAAS in celebrating 60 years' German Nepal Friendship? How did NEGAAS participate and represent in German-Nepal day on April 20, 2019? How could these historical events be transformed in attaining symbols of landmark achievements for further strengthening the German Nepal bonds?*

NEGAAS actively participated in celebrating the 60th anniversary of German-Nepal Friendship. NEGAAS presented a poster and gave a talk during the German Nepal Day on April 20, 2019. It also partnered with KU and DAAD to have a half-day presentation about DAAD's activities in Kathmandu University on April 21, 2019. These activities were attended by more than 200 students and faculties.

NEGAAS, in collaboration with the German Embassy, organized a half-day talk program on "Retrospect and Prospect of Nepal-Germany diplomatic relationship: the role of Alumni from German Academic Institutions in Nepal's Development" to mark the 60th Anniversary of Nepal German diplomatic relationship on May 12, 2019. More than 80 people from various walks of life participated in the talk program. I believe through:

- Debate and Dialogues
- Collaboration and Cooperation
- Academic Networking

we could transform these historical events in attaining symbols of landmark achievements for further strengthening the German Nepal bonds.

17) *Under your leadership, NEGAAS's Executive Board has recently met the Board of Directors of the ANAA (Association of Nepalese Alumni from Australia) as a gesture of like-minded organizations coming together. How could NEGAAS and ANAA work to establish long-term relationship, campaigning hand-in-hand in their endeavors to help the Nepalese students seeking opportunities to study in the universities of Germany and*

Australia and also to be employed? How could this relationship open doors to academic collaboration with many other like-minded Alumni for a dynamic framework to have synergic effect for the development of Nepal's various sectors?

NEGAAS is looking forward to having formal MOU with ANAA soon, the draft of which is already scrutinized. Through this MOU we are planning to have a joint workshop/training on snake-bites in Nepal as an example. ANAA also participated in various ways in NEGAAS's activities, which has broadened our horizon for collaboration with its partners as well. This does mean that our relationship has opened doors to academic collaboration with many other like-minded alumni not only from Germany but also from other countries for a dynamic framework to have synergic effect for the development of Nepal's various sectors.

- 18) *GAAN, the umbrella organization of all the German Alumni Associations of Nepal, established under the inspiration and leadership of the former Ambassador of Germany Mr. Matthias Meyer has unfortunately not stood up to its expectation. What was the requirement of this umbrella, considering that NEGAAS was established since decades ago, and it was playing lead role in collaborating with all the Alumni? What are the reasons for GAAN's failure to meet its expectations—lack of commitment and responsibilities of its President(s), disparity between the member Alumni, loss of its members' motivation, scarcity of support from the German counterpart, or something else?***

The German Alumni Association of Nepal (GAAN) struggles to meet its expectations as an umbrella organization despite the fact that NEGAAS was one of the leading organizations crucial for GAAN's establishment. There might be several reasons why GAAN could not do much. However, as the President of NEGAAS, I see a good chance to revive GAAN's role by bringing GAAN to lead. There is a need for discussion between NEGAAS, GAAN, and other Alumni Organizations in order to bring back GAAN on track. In the absence of GAAN, NEGAAS is bridging the gap, which are well in line and supported by the diplomatic mission of Germany and European countries.

- 19) *Based on the overall success of NEGAAS since the past three decades actively engaged in the academic exchanges and multiple missions simultaneously, and also considering its service as a pillar of Nepal German academic and diplomatic relationship, how do you see the prospect of NEGAAS as an engine to host annual German Alumni Conference in Nepal with the endorsement of the German counterpart?***

Prospect of NEGAAS as an engine to host annual German Alumni Conference in Nepal with the endorsement of the German Counterpart is great. We would like to explore all possibilities to meet the deadline to host such a prestigious conference in Nepal with the endorsement of the German counterpart. For this, our EC has given the green signal to go ahead with writing a proposal to prospective donors for financial support for the conference on "Natural Resources for Nepal's Economic Development: Opportunities and Challenges in the 21st Century" by the end of 2019. In collaboration with German Embassy and DAAD Regional Office, New Delhi, NEGAAS looks forward to have a DAAD Research Ambassadors Meet in Kathmandu by 2020. NEGAAS is ready to go ahead with any good proposal from its members and partners for collaboration.

- 20) Based on the fact that Germany is among the top 10 business partners of Nepal both in terms of Export and Import, how could the two countries further expand their mutual trade and business relationship? What actions are necessary from the governments, institutions and private sectors to expand the two countries' economic cooperation through trade and business? On which areas of industries the two countries could collaborate for the mutual economic prosperity?**

Besides well-established export and import between two countries, I think, Nepal and Germany could expand their mutual trade and business relationship in the following areas:

- a. Food, Beverage, and Agriculture
- b. Renewable Energy (Hydropower, Solar PV, Wind, etc.)
- c. Electronics
- d. Academics
- e. Fabrics
- f. Machinery
- g. Organization of Trade fairs in Nepal

- 21) Despite the sea difference in Nepal's and Germany's socio-economic development status, culture, and religion, the two countries have been enjoying unique relationship and deep friendship over the past 60 years. There are over 115 German NGOs working in Nepal and over 200 Nepal related Organizations active in Germany- all geared up on the basis of partnership for sustainable socio-economic development and friendship. What are the three lessons Germany and Nepal could learn mutually from each other, standing beyond their national boundaries in a global world to establish a harmonious society with peace and tranquility to reign over human civilization with health, happiness and prosperity to all regardless of their race, cast, color, creed and gender?**

To establish a harmonious society with peace and tranquility, both countries should respect the long-standing relationships mutually, and among them the three lessons are:

- a. Federalism in Nepal can only flourish through thorough democratization process.
- b. Partnership for prosperity and the process of poverty alleviation.
- c. Unity in diversity, peaceful nature, and cultural behavior of Nepalese people.

- 22) Please elaborate on your role as a Research Ambassador of German Academic Exchange Service (DAAD), an honorary position from which you've been serving since 2014. How has it been significant for R&D in Nepal's context, in raising the quality and depth of research benefitting scholars, researchers and wider society? Considering the professional height NEGAAS has already attained, how is NEGAAS viewed by DAAD, as measured from the annual meets at DAAD regional office in New Delhi and at the head-office in**

Bonn? Apart from the annual seminars and workshops NEGAAS has been conducting, please name some extra activities on which NEGAAS could work in partnership with the DAAD to further extend NEGAAS's professional height. How do you see yourself as a future Nepali Ambassador to Germany?

My role as a Research Ambassador of German Academic Exchange Service (DAAD) is to collaborate with DAAD Regional Directorate in New Delhi India as well as the German diplomatic mission for the dissemination of personal experience on studying and life in Germany to prospective students through seminars, workshops, and conferences. The R&D in Nepal's context in raising the quality and depth of research benefiting scholars, researchers and wider society has not been very significant. However, the culture of doing R&D is slowly taking place in Nepal after universities as well as research organizations are being established. Nepal Academy of Science and Technology, an apex body of Government of Nepal, has the highest honor of being responsible for promoting R&D in Nepal. The Government of Nepal is also promulgating its Science Technology and Innovation (STI) Policy 2076 soon with the aim to accelerate the sustainable development for the prosperity of Nepal. I am also involved in evaluating the draft STI Policy, being one of the four members of the high-level committee under the chairmanship of the Minister of Education, Science, and Technology. I am confident that the R&D culture in Nepal will be enhanced and the prosperity of Nepal will be achieved based on the STI in the near future.

DAAD has high regard for NEGAAS and its activities in promoting German Alumni in Nepal. NEGAAS has been DAAD's good partner in the past and continues to be a valuable partner for the dissemination of DAAD's objectives that match with NEGAAS objectives. To raise the height of NEGAAS, the major activities, inter alia, it should be performing are:

- Strengthening partnership with DAAD and other funding agencies in Germany such as Humboldt, Calrs Duisburg, etc.
- Playing crucial role in organizing the DAAD Research Ambassadors' Meet in Kathmandu and also participating in Delhi etc.
- Conducting regular programs with Goethe Zentrum Kathmandu for uplifting the language and cultural values of both countries for which NEGAAS has already signed MOU with Goethe Zentrum under the auspicious presence of H.E. Roland Schaefer of the German Embassy in Nepal.
- Organizing visits to German Academic and cultural institute in India and Germany vis-à-vis with the partnership with Germany.

This is a good idea, indeed, to become a Nepali Ambassador to Germany in the future. This would be the highest honor in my life. I am learning the nitty-gritty of becoming a diplomat, however, it is an evolutionary process to get mature for this position. One thing I am confident about is that once NEGAAS's position in Nepalese society will be visible through its activities, then it will not be difficult for any member of NEGAAS to become an Ambassador to Germany. We already have two of our members as Ambassadors to Germany in the past.

- 23) DAAD has been providing scholarships to Nepali students to pursue Masters Degree either in German's or Asia's top Institutions—namely AIT Bangkok and IIT Bombay. But you have been staunchly advocating to relocate these scholarships for study seats in KU. In this age of globalization, what is your view on why potential students should opt for higher education in their native country, instead of going abroad where they are likely to get broader curriculum choices, and wider international exposure and experiences? How is DAAD's response on your view? Instead of the relocation from the other institutions, what is the possibility of the DAAD scholarships extension to KU?**

Yes, it is true that in the age of globalization it is better for Nepali students to opt for international exposure through scholarships. However, due to the lack of better choice for study in Nepal for higher education as well as due to the lack of enough infrastructures at existing universities, many Nepalese have no option than to go abroad. It means not only a better brain to be drained but also a huge drain of financial resources.

It is fine, if the Nepali students immensely benefit from DAAD's scholarships to study abroad, especially in Germany, AIT Bangkok, and IIT Bombay. However, not many Nepali students leave Nepal for higher studies due to their own reasons. DAAD seems positive, that is why it has opened up regional scholarships for students from Bangladesh and Nepal to study in IIT Bombay. I think a similar scheme could also be extended to Nepal through diplomatic negotiations. Since Kathmandu University and Tribhuvan University are doing this with Universities in Europe for several years, I see the possibility of the DAAD scholarships extension to our universities through lobbying.

- 24) You have been advocating to reverse the traditional trend of Nepali students flocking to Germany and the other Western countries for higher education, by inviting students from Germany and the other European countries to study in the universities in Nepal, for example, to enroll in Masters or Ph. D. in Art, Music, or Culture at KU or TU or in International Buddhist Studies at LBU (Lumbini Buddhist University). If this is to be materialized, what type of exercises are necessary at governmental, institutional and personal level by these countries?**

Yes, there is a high potentiality for reversing the trend to make a balance in educational aspects. Traditionally, students from Germany and other European countries got scholarships to go abroad for higher education especially to the USA. Provided they receive scholarships to study in Nepal, I think it is possible to attract students not only from Germany and European countries but also from other countries, for example Africa. This is not a new idea. Many universities in European countries are encouraging their students to do a part of their study in Nepal on institutional or on personal level.

Provided a scholarship scheme in the form of a joint educational program, viz. a Masters course, that a University in Germany develops in collaboration with a University in Nepal, then not only Nepali students be benefitted but also German students or any international student will be equally benefitted to study in Nepal. On top of that, any higher educational institution in Nepal would be a better place for German or international scholars to study the subjects of their choice. For example, German scholars may opt for International Buddhist Studies at Lumbini Buddhist University or at Kathmandu University. Likewise, they might also go for learning Sanskrit and Ayurveda, Ethnological Arts, Culture and Music or even

Engineering and Medical Sciences, etc. in Nepal. Nepal offers a unique atmosphere for learning and doing R&D. In that way, the government of Germany could extend its partnership with the Government of Nepal in the education sector through G to G (Government to Government) model or through I to I (Institution to Institution) model. I fully agree with the idea H.E. Mr. Roland Schaefer that was put forward during a recent talk program organized by NEGAAS in May 2019 at ICTC building of IOE to extend Germany's practical knowledge through an apprenticeship in Nepal. This would bring a double benefit for Nepal in creating jobs as well as for industrial development.

- 25) *Due to the lack of social cohesion and employment opportunity for educated spouses in Germany, the Nepali students pursuing post graduate studies in Germany are less inclined to integrate themselves into the German society, and many prefer to move to the US or other English speaking countries for better opportunities. Some brilliant Nepali students have declined offers for higher education in Germany despite the prestigious DAAD scholarship. What are the lessons for Germany to learn from these incidents to improve its underlying policies, specifically in addressing the concerns of the spouses, so that the graduates from German universities continue to bond ties with Germany?***

Stability is there where the family is near! Many Nepali students pursuing post-graduate studies in Germany have family and they cannot leave them alone during the period of their study. Since the work regulation in Germany is very strict, spouses of these students cannot get a work permit for earning. DAAD and other funding agencies in Germany provide equal opportunity to spouses to be enrolled in higher education or to learn the German Language through scholarships. However, not many take this opportunity due to their educational background. If they do not have the capacity to learn the German Language, then these spouses will not have better choices other than stay back in their respective houses or do not accompany their better half. They do not see the future in Germany, even though for a short period of time, and rather opt for going to the USA or to Australia, where they can communicate easily and earn for their future.

This is the main reason why some brilliant Nepali students have declined the DAAD scholarship in the past. The German Government should have a better policy for the integration of students as well as their spouse in economic activities so that their living could be possible and they could 'earn while learn' more together for their future just like in other countries of destination. I think the Government of Germany has now become more flexible in welcoming immigrants, and the policy is becoming conducive also for scholars to stay a few years more after their study.

- 26) *As a Founding HOD of Civil & Geomatics Engineering, and as a Dean of School of Engineering, Professor Maskey, based on your 13 years' academic expertise in Nepal and 12 years' in Germany, how do you evaluate the quality of KU's Engineering Education in the past 10 years? How effective has been the role of curriculum to create capable and competent Engineers to lead our industry to the future? Given that, at time, even the engineers with outstanding capabilities lack opportunities to put their skill into practice, how important is it to have realistic market-demand study before deciding the quantities and types of engineers to be produced? What are the measures taken by KU in recruiting, retaining and promoting competent academicians?***

The quality of KU's Engineering Education, especially in Geomatics and Civil Engineering, which I am responsible for, has been phenomenal since the past 13 years. As compared to already well-established engineering courses in other disciplines, Geomatics and Civil Engineering students are finding better jobs upon completion in Government and private sectors. The choice for students for BE in civil engineering with specialization in hydropower engineering has been tremendous. Since 2009, around 40 students compete for 1 seat in civil engineering and this ratio is maintained till now.

KU is concerned for its quality education and it has the policy for not allowing affiliation in engineering education. The curriculum of engineering subjects is designed in such a way that our graduates are theoretically and practically capable and competent to lead our industries. A lot of time and effort have to be dedicated in bringing students to a field where they learn practical skills. It is obligatory to have a realistic market-driven study for the development of a curriculum that makes our graduates fit for the job as well as to become entrepreneurs. Though the market needs more graduates, KU has certain restrictions on increasing the number of seats, which is just because of the lack of infrastructure and competent academicians for quality education. KU puts a lot of efforts for the recruitment and promotion of competent faculties. However, faculty turnover is also high due to the non-implementation of the policy for retaining them.

- 27) *It is no secret that Nepal's brightest students have historically opted to go for the engineering and medicine. They are still regarded as the country's best brains, and our society views them with high regards. As a Professor of Engineering, what is your view in extending the agenda of Dr. Govinda KC's medical-mafia-elimination doctrine in regulating the functions of private and government engineering institutions ensuring that only capable students get admitted to Engineering and that the Engineering education is accessible and affordable to the best and the brightest students across the country?***

Dr. Govinda KC's doctrine to eliminate medical-mafia and to promote the quality education in medical sciences is also valid for engineering education. However, the amount of fee for a medical student is not comparable with the amount of fee for an engineering student. Though ethically and morally both professions are highly responsible, the engineering profession, in my opinion, is far more responsible in cases of technical failures, natural calamities and disasters. However, the cost of engineering education is largely suppressed at Kathmandu University in comparison to another discipline. To enhance practice-based education in engineering, the fee is rather low. KU is a non-profit institution and it cannot raise the fee. Therefore, certain compromise in quality is inevitable as students do not want their education to be costly. In such a situation, KU has to increase scholarships to attract better brains. That means certain financial burden has to be covered by the Government for making the engineering education more accessible and affordable to best and the brightest students across the country. This will have two positive economic impacts: (a) Institutions like KU will have better infrastructures for quality education and (b) the best brains will remain in Nepal, which consequently would reduce both the brain drain and money drain to other countries. Since KU property is ultimately the government property, the scholarships is the investment on future of Nepal.

- 28) Please elaborate on the events organized by KU as a facilitator to German researchers and experts to conduct researches in Nepal. How effective has KU been in serving as a platform for both the Nepalese and German scholars to work together? Please highlight on the qualitative approaches that should be taken both at government and university level for KU's recognition and reputation to a wider globe as a destination for quality research.**

KU provides a platform for German researchers and experts to conduct researches in Nepal in many ways. Researchers from the University of Munich have been sending its students and faculties to jointly conduct researches particularly in micro-hydropower, renewable energy and automobile, etc. In this way, not only our researchers and students benefit but also the rural communities profit from our collaboration at large.

KU is conscious about its reputation and recognition to a wider globe as a destination for quality research, and therefore, the Vice-Chancellor's office for Global Engagement has been established through which KU is spreading over its networking. KU is also lobbying Government for financial and material support so that the end effect on the national economy would be high. Further, if German government provides scholarship to its citizens to study in Nepal then KU could be a good platform for mutual research and development.

- 29) KU has been offering courses from Engineering and Medicine to Management, Social Science, Arts, Music and International Buddhist Studies, attracting students and experts from international community for higher education and research. Could you share your ideas on a 10-year road-map that could develop KU as a center of excellence, comparable to Thailand's AIT, or India's IITs and IIMs.**

It is obvious that if KU runs on the 'business as usual' model, then it will not spread its wing for quality and prosperity. Therefore, KU has to undertake bold steps to walk along the following 10-year long road-map:

1st year: Improve the academic as well as extracurricular activities a bit better than the present condition.

2nd year: Spread over the networking between like-minded universities, industries, and organizations.

3rd year: Transfer students from the dry lab to wet lab (Bring them to the community).

4th year: Build the infrastructure and provide ambiance for better studying and learning from extracurricular activities.

5th year: Increase the intake of students in highly demanded courses based on the market-study.

6th year: Increase the fee by a certain amount at break—so that more scholarships are provided for needy and brilliant students.

7th year: Attract capable human resources in academics, promote their in-house capacity building, and bring the retention policy.

8th year: Introduce more cutting-edge education and technology and promote AI based Science, Technology, and Innovation in every aspect of life

9th year: Provide a platform for joint project implementation, develop more curriculum.

10th year: Emphasize more fundamental as well as industry-based research and development and involve undergraduates as well as graduate students and M Phil and Ph.D. students.

- 30) *It's been 4 years since the promulgation of Nepal's new constitution, which incorporates the Federal structure. How long do you think it might take Nepal to realize the theoretical concept of federalism in practice having a prosperous Nepal with a just society with equal right to all and a balanced development, decentralizing the power of the capital to all the federal states? What are the three potential resources that Nepal needs to capture and harness for this model of Federalism to be effective.***

The federalism is still in the infant stage of development in Nepal. The provincial and local governments do not have experience and proper orientations and the central government is having trouble delegating its long hold power. I would estimate it may take another decade to fully harness the fruits of federalism in Nepal. Among other several issues to be resolved, the equal rights among the states may drive the balanced development and sharing of resources and the decentralization of power may occur. The three potential resources may be:

- a. Utilizing the knowledgeable and skilled human resources of federal states
- b. Harnessing the locally available natural resources and locally made products (water, forest, energy, and food)
- c. Preserving the local tradition and cultural heritage for future generation by transforming them to generate income

- 31) *Geographically, historically, and culturally, Nepal's relation with India is seen as deeper and closer. But to reduce Nepal's excessive dependence on India, politicians and experts often argue that it is prudent for Nepal to cultivate strong economic partnership with China. How do you see the prospect of Nepal playing the role of a bridge connecting the two major economies, and materializing the concept of China-Nepal-India corridor? What will it take for all the three countries to realize the triangular partnership in investment, trade and business?***

Our good relationship between our neighbors should be maintained diplomatically. Nepal cannot afford to lean on either side. However, Nepal has to be independent in every aspect of her life-sustaining things that mean to be sufficient in water, energy and food nexus. Nepal should develop an attitude of being a connecting bridge between China and India and not the overflying bridge. The concept of triangular partnership between these three countries that was put forward by a Chinese diplomat a few years back is a good concept based on harnessing Nepal's hydropower with Chinese investment for India's market. However, this triangular relationship requires sensitive diplomatic interventions to wipe out the long-standing misconceptions among its people. Fair Partnership for Prosperity is the key for 21stcenturies development modality.

32) Last but not the least, the newly elected government in Nepal vows to turn Nepal into a developed country by 2030, which is only 11 years away from now. Professor Maskey, if you were the Prime Minister of Nepal, what would you do to achieve this goal? Please highlight the major issues to be fixed, clarify the prerequisites and outline the approaches needed in leading the country to achieve the goal.

Yes, to become a developed nation is an ambitious but realizable aspiration. However, Nepal has to first graduate from her present less developed level into a more developing country's level. The target to achieve is by 2022. By 2030 Nepal has to achieve SDG. If I were the Prime Minister of Nepal, the major issues to be fixed, clarify and outline the approaches I would like to address are as the following:

- a. **Alleviate** poverty and disparity through encouraging the provincial government to enforce local governments in realizing basic infrastructures first to satisfy the day-to-day needs of the Nepalese people.
- b. **Build** political consensus for stability in the nation through the thorough implementation of the power provided by our constitution without any controversy.
- c. **Catalyze** the implementation of laws and order for public peace and security by enforcing security personnel in the existing bureaucratic system.
- d. **Discourage** and a complete demolition of the corrupted systems and abuse of authority through implementation of Information Technology (IT) and digital database for transparency in the institutions.
- e. **Encourage** Foreign Direct Investment (FDI) for bigger infrastructure projects such as hydropower and encourage Nepalese to invest in smaller and realizable projects so that most of the hard-earned money will remain in the country.
- f. **Fairness** and improved longstanding relationship with our neighboring countries to be given priority, and to go for developing diplomatic relationships with countries in the world.
- g. **Groom** Nepali diaspora and cross-border migrants to do for Nepal from wherever they may be through partnership. This is the largest and important resource for Nepal's development, which we should not forget.
- h. **Heighten** Nepal's image in international arena by achieving the highest HDI.
- i. **Insure** fundamental human rights to the citizens of Nepal and her guests.
- j. **Levitate** the level of science, technology and innovation for the betterment of life in a sustainable way and be in the front line to address the issues of 21st century.
- k. **Motivate** academics and industrialists for networking so that the capable human resources could be retained in the country.

- l. **Normalize** the present political situation so that people can invest your time and efforts for nation building rather than spending their time for political gossiping.
- m. **Overcome** from our present poor mentality to become reach morally and ethically.
- n. **Provide** education to all in a sustainable manner.
- o. **Qualify** Nepal as a developing country through implementing all the criteria necessary.
- p. **Refrain** Nepal from any kind of ideological and religious alignment with any others that may create mistrust and conflict.
- q. **Stabilize** present political turmoil for establishing peace and prosperity in Nepal.
- r. **Transcend** Nepal's cultural and social values to a new height.
- s. **Utilize** Nepal's natural resources with value added for economic and social prosperity.
- t. **Value** everybody's social norms and status on the principle of equality.
- u. **Warden** out the living standard of people of Nepal and its guests.
- v. **Yield** enough Nepali products so that could be traded in international market for its prosperity.
- w. **Zeal** for a Prosperous and Happy Nepal.



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Telephone No: 01-5013270
Email: geotech.hydro@gmail.com



Contact Personnel:

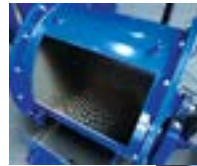
- | | |
|-------------------------------------------------------------------------------|-------------------------------------------------|
| 1. Dipak Raj Pokhrel
Managing Director
+977-9851126907/ +977-9801902607 | 2. Rina Basnet
Accountant
+977-9801902606 |
|-------------------------------------------------------------------------------|-------------------------------------------------|



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Registration No: 148209/72/073
Pan No: 604248398
Telephone No: 01-5013270
Email: info@traceablemeasurements.com.np



Contact Personnel:

- | | | |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------|
| 1. Dipak Raj Pokhrel
Chairman
+977-9851126907/ +977-9801902607 | 2. Binod Prakash Pandit
Managing Director
+977-9851129201/ +977-9801902614 | 3. Thaman Bahadur Khadka
Director
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Registration No: 136029/71/072
Pan No: 603501047
Telephone No: 01-5013270/01-5528247
Email: geotechandhydrosolution@gmail.com

Contact Personnel:

1. Dipak Raj Pokhrel
Managing Director
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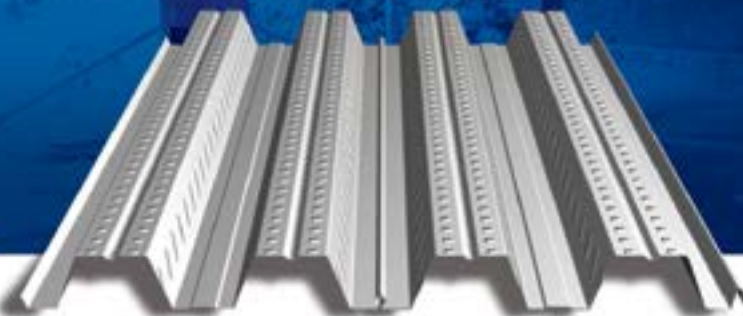


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NEGAAS Activities

30th Annual General Meeting of NEGAAS



The 30th Annual General Meeting (AGM) of Nepal German Academic Association (NEGAAS) was held on 28th July 2018 (2075/4/12 B.S.) Aryal International Hotel, Baneshwor. The AGM was chaired by outgoing President of NEGAAS Mr. Surendra Dhakal. His Excellency Roland Schäfer, the Ambassador of Federal Republic of Germany was present as the Chief Guest along with his spouse Brigitte Chéron-Schäfer. The event was divided into two sessions. In the first session, outgoing president stated the progress and financial reports for the last fiscal year. The past President, Dr. Roshana Shrestha briefed the history on NEGAAS and its achievements. During the session, new members were elected in their designated posts under the President-ship of Prof. Dr. Ramesh Kumar Maskey. In the second session, the past President, the immediate past President and the President jointly awarded the Honorary Membership of NEGAAS to the Chief Guest of the session HE Roland Schäfer. Finally, the president Prof. Maskey highlighted on the basic framework for how the newly elected committee will function in the upcoming two years and placed Vote of Thanks to all participants for their contribution. He further informed that a planning workshop will be conducted to discuss objectives of new Executive committee and various activities.

NEGAAS conferred Honorary Membership to HE Roland Schäfer



On 28th July 2018 NEGAAS conferred its Honorary Membership to German Ambassador to Nepal, His Excellency Roland Schäfer. On the occasion Immediate Past President Mr. Surendra Dhakal highlighted the special relationship Nepalese academicians hold with Germany. He further elaborated NEGAAS role in strengthening Nepal-Germany relations. President Prof. Ramesh K. Maskey informed that NEGAAS would like to work closely with German Embassy to promote Nepal-Germany academic relations and develop mutual understanding and cooperation among the academicians of both the countries. His Excellency Roland Schäfer was present together with his spouse Mrs. Brigitte Chéron-Schäfer & Ms. Kathrin Junken, Director of Goethe Zentrum Kathmandu. HE Roland Schäfer expressed his happiness for being a member of NEGAAS and NEGAAS's role of - a bridge between Germany and Nepal in the exchange of cultural and academic activities. He provided his best wishes to the newly elected members.

Dr. Manfred Treu awarded with prestigious Nai Derunikh International Prize



The Nai Publications has awarded prestigious “Nai Derukha International Award” for 2074 B.S to Dr. Manfred Treu., life member of NEGAAS for his four-decade-long contribution to the expansion of Sanskrit language and service to the Nepali education sector. Dr Treu has played an active role in promoting Nepalese culture, history and language in the international arena through research, publication, teaching and academic presentations. Dr Treu is the sixth personality to be honoured with the annual prize presented to the foreign nationals. Dr. Satyamoan Joshi , Satabdi Purush handed over the award to Dr. Treu. It carries a purse of NRs 300,000. NEGAAS feels proud on his achievement and congratulates Dr. Treu for this award.

DAAD Ambassadors attended workshops held in New Delhi

Two members of the current NEGAAS executive committee namely, Mr. Rupesh Shrestha and Ms. Sabina Khatri, serving as secretary and treasurer respectively, are also representing DAAD Young Ambassador of Nepal.



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They attended a workshop organized by the DAAD regional office, New Delhi 23-25th August 2018 where they were trained about undertaking their task as young ambassador of DAAD.

Following this event, a similar workshop held by the regional office, New Delhi again, was attended by the current president of NEGAAS Prof. Dr. Ramesh Maskey, who is also one of the two DAAD Research Ambassadors of Nepal.



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Celebration of German Unity Day (Tag der Deutschen Einheit)

NEGAAS President Prof. Dr. Ramesh K. Maskey, NEGAAS Immediate Past President Mr. Surendra Dhakal, Past President Mrs. Roshana Shrestha and NEGAAS Secretary Ar. Rupesh Shrestha participated in reception hosted by The Ambassador of the Federal Republic of Germany HE Roland Schäfer and Brigitte Chéron-Schäfer on 5th October 2018 at the Ambassador's residence to celebrate the Day of German Unity (German: Tag der Deutschen Einheit). The German Unity Day is the national day of Germany, celebrated on 3 October as a public holiday. It commemorates the anniversary of German reunification in 1990.



NEGAAS picnic 2018 conducted successfully at Shivapuri National Park



As part of NEGAAS Social and cultural exchange, a picnic was conducted on October 6th 2018, Saturday . There were 20 number of participants. The program included a short cultural visit of Budhanilkantha temple, breakfast & lunch at Green Valley Resort and hiking trail with beautiful waterfall, fresh air and view down the hills towards Kathmandu Valley (event also included a surprise meet with H.E Roland Schäfer who was doing a hiking trip with his spouse Frau Schäfer). Life members conducted Monthly meeting and exchanged Dashain and Tihar joint greetings. Later entertainment program with - Music and Poetry program was conducted with Prof. Dr, Ramesh K. Maskey & Col. Buddha Shakya singing ; Prof . Dr. Rameshwor Adhikari reciting poems and anecdotes.

NEGAAS at “Study in Europe Fair 2018”



NEGAAS was present at “Study in Europe Fair 2018” together with DAAD New Delhi team, German Embassy Kathmandu & Goethe Zentrum Kathmandu on Oct 8-9, 2018 at Hotel Annapurna, Kathmandu. Around 1100-1300 people visited the 2 day event. President Prof. Dr. Ramesh K. Maskey ; Secretary Ar. Rupesh Shrestha & Treasurer Ms. Sabina Khatri were present during the event and informed visitors about “Study in Germany” and Scholarship / funding possibilities available. Also, NEGAAS past journals and NEGAAS activities were presented to prospective German University students.

Presentation in First Non-Resident Nepali (NRN) Knowledge Convention, Oct 14th 2018



1st NRN Global Knowledge Convention was held in Kathmandu from 12 to 14 October 2018. The convention was organized by the Non-Resident Nepali Association (NRNA) in partnership with the Government of Nepal (GoN). Mr. Rupesh Shrestha from NEGAAS and Ms. Kabita Thapa from German Embassy Kathmandu participated in the event and delivered presentation on title "DAAD fellowship for academic exchange between Germany and Nepal". A panel discussion was organized later to talk about scholarship and research funding for Nepalese scholars.

Breakfast meeting with German Ambassador H.E. Roland Schäfer

On the 09th of October 2018, Heads of each German Alumni club Nepal in Nepal were invited by German Ambassador H.E. Roland Schäfer for a short breakfast meeting at his residence. Prof. Dr. Ramesh K. Maskey (President of NEGAAS & DAAD Research Ambassador for Nepal), Ar. Rupesh Shrestha (Secretary of NEGAAS & DAAD Young Ambassador for Nepal), Ms. Sabina Khatri (Treasurer of NEGAAS & DAAD Young Ambassador for Nepal) were present during the event. Various topics related to alumni affairs, development works & academic programs were discussed. The event also helped in networking with other Alumni groups in Nepal.



Concert in honor of 60 years of Diplomatic Relations Germany – Nepal



The German Embassy organized „Chamber Orchestra of Stuttgart” playing a concert in honour of the 60th anniversary of diplomatic Relations between Germany and Nepal at Regency Ballroom, Hyatt Regency Kathmandu on December 29th, 2018.

NEGAAS President - Prof. Dr. Ramesh K. Maskey, Secretary- Ar. Rupesh Shrestha, Immediate Past President - Mr. Surendra Dhakal and Past President - Mrs. Roshana Shrestha participated in the event.

NEGAAS signs MoU with Goethe Zentrum Kathmandu



In order to promote academic exchange programs and making NEGAAS recognized in German Diplomatic, external organisations & Alumni affairs NEGAAS has signed an MoU with Goethe Zentrum Kathmandu (GZK) in presence of H.E. Roland Schäfer in German Embassy Kathmandu on Jan 14, 2019 Monday. Staffs of German Embassy were also present during the event. President of NEGAAS Prof. Dr. Ramesh K. Maskey, Secretary Ar. Rupesh Shrestha, Treasurer Ms. Sabina Khatri were present on behalf of NEGAAS. President of GZK Mr. Binaya Neupane, Direktor Ms. Kathrin Junken, Secretary Anil Sapkota, Members Mr. Shyam Chalise & Mr. Jaya Pradhan were present on behalf of Goethe Zentrum Kathmandu.

The partnership aims to bring together those who have studied in Germany and those who want to. It will be about exchanging experiences, expectations, excitement and maybe also concerns. It will also further facilitate academic exchange programs.

Informal Get-Together

German Ambassador to Nepal H.E. Roland Schaefer invited NEGAAS life members on April 19th 2019 in an informal get-together as a preparatory meeting for celebrating 60 years of Nepal German Diplomatic Relations. This informal get-together helped in preparing "Germany Day" on April 20th 2019 in which a talk programme was held in cooperation with experts from the German Academic Exchange Service (DAAD).



Third Alumni Meeting of the DAAD Alumni Associations

DAAD holds a large network of associations / alumni clubs together with as many as 170 alumni associations worldwide. For this purpose, DAAD organized the Third Alumni Meeting of the DAAD Alumni Associations / Drittes Treffen von Alumni-Vereinen aus aller Welt in Bonn, Germany from 7th to 10th March 2019. The meeting offered the opportunity for in-depth exchange among alumni association to broaden knowledge on soft skills in the form of workshops that is useful for alumni work.

DAAD appreciates the role of NEGAAS as important for international exchange. NEGAAS engagement has contributed as an important part for sustainability of the DAAD scholarship programs. NEGAAS has the highest number of DAAD scholarship holders as "life members" for Nepal and such is an important partner Alumni Association. With this meeting DAAD wanted to strengthen, exchange and interconnect the alumni associations. The event also included poster presentation session where alumni clubs can present their club events.

Dr. Dorothea Rüländ, General Secretary of DAAD invited Mr. Surendra Dhakal and Mr. Rupesh Shrestha to participate in the event. Mr. Surendra Dhakal is Immediate Past President and Mr. Rupesh Shrestha is Secretary Nepal German Academic Association (NEGAAS).



Group Photo during Third Alumni Meeting of the DAAD Alumni Associations
Bonn, Germany
Date :- 7. – 10. March 2019

Alumni-Talks at "Germany Day"

German Embassy Kathmandu organised the German Energy and Transition Exhibition at the Information & Communication Centre, Pulchowk Campus, Lalitpur. On April 20th 2019, Saturday "Germany Day" program was organised. On that day, DAAD New Delhi officials elaborated about Study in Germany and scholarship opportunity to Nepalese students through DAAD. NEGAAS participated in Alumni-Talks session. Mr. Rupesh Shrestha, Secretary of NEGAAS and Ms. Sabina Khatri, Treasurer of NEGAAS shared their experiences about studying in Germany to prospective students and few tips while studying in Germany.



The German Energiewende Travelling expo + Talk programme



NEGAAS life members participated in travelling exhibition held between April 12th – April 26th 2019 at ICTC building, Pulchowk Campus, IOE, Lalitpur. The travelling exhibition illustrated the German Economy's transformation towards reusable energy sources. Germany is playing a major role in climate protection and brings a message to Nepal: Let's work together on green energy! The traveling exhibition has already toured more than 80 locations in about 40 countries and has been seen overwhelmingly across the world. The exhibition was organized on a pretext of completion of 60 years of diplomatic relations between Nepal and Germany.

"Interaction with DAAD" celebrating the 60th Anniversary of Nepal-German Diplomatic Relationship



NEGAAS members have coordinated with German Embassy Kathmandu, DAAD New Delhi, Kathmandu University and have successfully organised - "Interaction with DAAD" on April 21st, 2019, Sunday at Kathmandu University, C. V. Raman Hall, Dhulikhel. This event was organised as a continuation of celebrating the 60th Anniversary of Nepal-German Diplomatic Relationship and as a follow-up event to mark the "German Day".

Around 200 students, faculty members participated in the event. Registrar of Kathmandu University Dr. Subodh Sharma was also present in the event and welcomed DAAD officials and NEGAAS office bearers. NEGAAS President Prof. Ramesh K. Maskey welcomed all the participants and elaborated about the content of the program.

Presentations were made from DAAD officials in topic:- Life in Germany, Study in Germany, Research in Germany, Scholarships & Funding.

Later an interesting session called "Alumni Talks - Nepalese who studied in Germany" was conducted. In this session, NEGAAS life members shared their story about life in Germany, study in Germany and current work / research to the participants.

Information brochures, flyers from DAAD / Study in Germany were distributed in the event. We also displayed NEGAAS journal, NEGAAS poster and our activities were presented to prospective German University students. We informed that NEGAAS as German Alumni group welcomes all other German Alumni(s) and requested prospective German University students to join NEGAAS after receiving a German University degree.

German Alumni organize a talk program on, 'Retrospect and Prospect of Nepal-Germany Relations: The Role of Alumni in Nepal's Development'



On 24th May 2019, Nepal German Academic Association (NEGAAS) organized a Talk Program on "Retrospect and Prospect of Nepal-Germany Relations: The Role of Alumni in Nepal's Development". The objective of the talk program was to discuss about the role of academia, NEGAAS and Alumni in shaping Nepal - German relations and achieving Sustainable Development Goals (SDG).

The key-note speakers in the talk program are His Excellency Mr. Roland Schäfer, the Ambassador of the Federal Republic of Germany; Dr. Madan Bhattarai, former Ambassador of Nepal to Germany; Prof. Dr. Ramesh K. Maskey, President of NEGAAS and Dr. Roshana Shrestha, founder of NEGAAS.

The talk program was organized inside the premises of Information and Communication Technology Centre (ICTC), Pulchowk Campus, Lalitpur.

DAAD scholarship counselling for post-graduate and Phd studies under DAAD scholarship together with German Embassy Kathmandu



NEGAAS supports counselling for -POSTGRADUATE and -PhD- studies in Germany under DAAD SCHOLARSHIP which were conducted at Goethe Zentrum Kathmandu premises, Thapathali in collaboration with German Embassy Kathmandu.

In the counselling session, students are informed on topics such as – What is DAAD? ; Why study in Germany ? ; Programs and scholarships for Nepalese students ; Study scholarship for Master’s degree program & Phd program under DAAD ; Regional scholarships; useful weblinks and distribution of brochures / leaflets.

This programme goes hand in hand with the “Study in Germany” sessions about the Visa procedure, held by the German Embassy at Goethe Zentrum. Students welcome these talk programmes a lot and are grateful for the support provided by NEGAAS.

Call for speakers for “Meet the Alumni” session

NEGAAS in collaboration with Goethe Zentrum Kathmandu has started a new session called “Meet the Alumni”. It is conceptualized to disseminate basic knowledge about German culture and lifestyle from the German Alumni in Nepal. Interested speaker can deliver informative talks on wide range of topics. We request NEGAAS members and German Alumni to come join and deliver talks. Details of the program are below:-

- a. **What** - It is an event where a German University Alumni based in Nepal will come to present about his/her experience or story in Germany & course/ specialized subject studied in Germany. The German Alumni will share knowledge about the specialized field of study to group of students. The prospective students can meet the alumni & build networks. The Alumni can share his University application process, relevant scholarships, life in Germany etc to the group of students. The topic of each session is flexible and will be up to the speaker.
- b. **When** - Once each month. (Date can be decided in consultation with Goethe Zentrum Kathmandu)
- c. **Where** - At GZK – Thapathali, Kathmandu
- d. **How** - NEGAAS will request its life members and German Alumni who want to share their knowledge on German University to come and speak in the program. Speaker can present about his / her specialized subject including how the Alumni applied to Germany, what scholarships were received, life in Germany, Professors who can be approached for study related matters, experiences, challenges in Germany, few useful tips while applying, etc. Talk usually lasts for 20 - 25 mins.



Meet the Alumni session commenced in collaboration with Goethe-Zentrum Kathmandu (GZK)

As part of cultural program with partner institution GZK- "Meet the Alumni" session is conceptualized to disseminate basic knowledge about German culture and lifestyle. This is a joint event with GZK where NEGAAS members can deliver informative talks on wide range of topics. As a start, NEGAAS Secretary Ar. Rupesh Shrestha delivered a talk on his experiences in Germany and sharing information on university application and DAAD scholarship applications. "Meet the Alumni" will be conducted inside GZK premises at Thapathali, Kathmandu.



NEGAAS @ "Everest Hackathon 2019" - July 20-21 2019

NEGAAS was present at " Everest Hackathon 2019 " together with Goethe Zentrum Kathmandu & German Embassy.

Almost 500 people visited / participated in the 2 day event. Participation in this event has contributed in visibility of NEGAAS. Also NEGAAS has successfully conducted another joint-activity with our partner organisation(s) Goethe Zentrum Kathmandu and also German Embassy Kathmandu.

President Prof. Dr. Ramesh K. Maskey ; Secretary Ar. Rupesh Shrestha ; Treasurer Ms. Sabina Khatri and NEGAAS life member Er. Abhinab Kadel were present in NEGAAS stall.

Dr. Rishi Shah, NEGAAS life member sponsored and handed over the prize to the winners of the Everest Hackathon 2019. German Embassy Kathmandu was the silver sponsor for this event.

NEGAAS poster, past journal and activities of NEGAAS were displayed to prospective German University students and event participants. Participants were informed about "Study in Germany" and Scholarship / funding possibilities available. Goethe Zentrum displayed about German language learning opportunities for Nepalese and representative of German Embassy explained about visa requirements for students who want to go to Germany in Student visa.



Annex-01 : Life Members of NEGAAS

Sn.	Name	E-mail	Telephone
1	Mr. Daya Ram Acharya	dracharya@gmx.de	
2	Dr. Narayan Prasad Adhikari		9851102815
3	Prof. Dr. Rameshwar Adhikari	nepalpolymer@yahoo.com	9841390927
4	Mr. Raja Ram Aryal	rajaram.aryal@gmail.com	9851098990
5	Dr. Satish K. Bajaj	npadhikari@gmail.com	
6	Ms. Sushma Bajracharya	sushma.bajracharya@gmail.com	9851105224
7	Dr. Dambaru Raj Baral	dambaruraj@yahoo.com	9741055111
8	Mr. Sambhu Dev Baral	shambhubaral70@gmail.com	9843405833, 9808990121
9	Asst. Prof. Dr. Netra Lal Bhandari	nlbhandari@yahoo.com	9841502699
10	Prof. Dr. Hari Datta Bhattarai	haridatta30@hotmail.com	9851172031
11	Prof. Dr. Pradeep Bhattarai	bhattaraipradeep@hotmail.com	9841390384
12	Prof. Dr. Tribikram Bhattarai	drtbb@mail.com.np	9860187141
13	Mr. Yuba Raj Bhusal	yrbhusal@gmail.com	9851015037
14	Prof. Dr. Marcus Brem	markus.brem@ globaltransferpricing.com	004982190899790
15	Mr. Shambhu Charmakar	shambhucharmakar@ansab.org saveflora.fauna@gmail.com	9843472445
16	Mr. Amrit Chitrakar		9841239318
17	Ms. Anita Chitrakar	chitrakaranita@hotmail.com	0049(0)176 76235320
18	Dr. Bhupendra Devkota	bhupendra.devkota@gmail.com	9851003473
19	Mr. Surendra Dhakal	sdn@info.com.np	9851023670
20	Prof. Dr. Tanka Dhamala	amb.dhamala@daadindia.org	9841152490; 014155160
21	Dr. Meghnath Dhimal	meghdhimal@gmail.com	9851167198
22	Dr. Ram Prasad Dhital	rpdhital@yahoo.com	9851076005

23	Mr. Dev Raj Gautam	gdev.sagarmatha@gmail.com dev.gautam@care.org	9851128079
24	Mr. Bishal Ghimire	abghimire@gmail.com	9843151222
25	Mr. Hira Mani Ghimire	h-ghimire@dfid.gov.uk	
26	Mr. Madhab Raj Ghimire	mrghimire32@gmail.com	9841776618
27	Mr. Girija Prasad Gorkhaly	gp.gorkhaly@gmail.com	9849732828
28	Er. Jeetendra Kumar Gurung	Jkgurung_59@hotmail.com	9841617586
29	Dr. Shekhar Gurung	grgshekha@gmail.com	9841489917
30	Prof. Dr. Chandra Bahadur Joshi	joshi.chandrab@gmail.com	9841777974
31	Mr. Rajesh Joshi		
32	Assoc. Prof. Dr. Rajendra Joshi	rajendra.joshi@ku.edu.np	9848423298
33	Dr. Rajendra K. C.	rkc_nep@yahoo.com rkc.gen@gmail.com	98511 49420
34	Mr. Prachan Karanjit		
35	Mr. Rajendra Kumar Karki	rajendra.kumarkarki9@gmail.com	9851075230
36	Mr. Shankar Prasad Kharel	shankarkharel@gmail.com	9851178855
37	Mrs. Sabina Khatri	sabinakhatri298@gmail.com	9841020504
38	Assoc. Prof. Dr. Lila Raj Koirala	lrkoirala@hotmail.com	4382694, 9841354671
39	Dr. Ajay Jung Kunwar	a.kunwar@yahoo.com	9852026560
40	Mr. Rom Raj Lamichhane	romrajlamichhane@yahoo.com	9851041872
41	Dr. Mandira Lamichhane Dhimal	ldmandira@gmail.com	9841536955
42	Dr. Sunil P Lohani	lohanisunil@gmail.com	
43	Er. Narendra Bhupal Malla	nbmalla@gmail.com	9851102815, 01-4106902 (R)
44	Dr. Menuka Maharjan	menuka48maharjan@gmail.com	9841904369
45	Prof. Dr. Ramesh Kumar Maskey	rmaskey@ku.edu.np	9851102699
46	Mr. Ganga Datta Nepal	nepal_ganga@yahoo.com ganganepal@gmail.com	9841831976, 9808815123, 014811055

47	Prof. Dr. Bharat Raj Pahari	bharatpahari@gmail.com	9851108579
48	Dr. Wolfgang Palz		
49	Mr. Aatma Prakash Paneru	gyaneswor83@gmail.com	9860232850
50	Mr. Surendra Pandit	just2suren@gmail.com	9851160205
51	Dr. Mahesh R Pant	maheshrajant@hotmail.com	
52	Prof. Dr. Tulsi Pathak	tulsipathak@gmail.com	9841326037
53	Dr. Babita Paudel	paudel36@hotmail.com	9851190189
54	Dr. Chinta Mani Pokharel	chintam@nec.edu.np	9845111411
55	Mr. Sunil Kumar Poudyal	herzlichst@gmail.com	01-4436555
56	Mr. Pramesh Pradhan	ppramesh@gmail.com	9851046554
57	Mr. Rajendra Pradhanang	rajendra.pradhanag@giz.org.np rajendra.pradhananga@giz.de	01- 4464767
58	Mr. Krishna Hari Pushkar	khpushkar@gmail.com	9851106376
59	Dr. Urmila Pyakurel	urmilapyakurel@gmail.com	9841049688
60	Prof. Dr. Novel Kishore Rai	novelkrai@gmail.com	9851120485
61	Ms. Shashi Rajbansi		
62	Er. Sandhya Regmi	sandhyaregmi2000@gmail.com	9849135212
63	Er. Rishi Shah	rishishah@enet.com.np rishi@ lotusholdings.com	15000114
64	Mr. Santosh Bickram Shah	shantosh_bs@yahoo.com	9841526895; 9741238930
65	Mr. Buddha Bahadur Shakya	buddhashakya@hotmail.com	9849092277
66	Ms. Sarita Shakya-Pradhan	saritaswaraj2002@gmail.com	9841576888
67	Mr. Prabin Raj Sharma	prabinrajsharma@gmail.com	9813492134
68	Dr. Anil Bahadur Shrestha	drabshrestha@gmail.com	9851113785
69	Mr. Hari Kumar Shrestha	hrst@mail.com.np	
70	Dr. Kamal Krishna Shrestha	kamalkshrestha@gmail.com	9851040549

71	Professor Dr. med Malakh Lal Shrestha	malawshr@yahoo.com	495115326238
72	Ar. Buddha Shrestha	buddha.shrsth@gmail.com	9861444411
73	Mr. Narayan Prasad Shrestha	narayan.shrestha@giz.de	
74	Mr. Nitesh Shrestha		
75	Dr. Roshana Shrestha	sh.roshana@gmail.com	9841617749
76	Ms. Rubika Shrestha	rajurubika@gmail.com	9851166966
77	Ar. Rupesh Shrestha	rupeshshrestha2005@gmail.com	9841945089
78	Asst. Prof. Dr. Samir Shrestha	samirstha@ku.edu.np	9841209655
79	Ar. Sharmila Shrestha	sharmilayu@gmail.com	9841111241
80	Dr. Saroj Krishna Shrestha	saroshmanepal@gmail.com	9851058233
81	Mr. Shanker Kumar Shrestha	shanker555@hotmail.com	9841293828
82	Prof. Sharada Shrestha	sharadashrestha@yahoo.com	9841499400
83	Dr. Shiva Shrestha		
84	Mr. Simon Shrestha	simkrshr@gmail.com	9841943284
85	Ms. Sulochana Shrestha Shah	sulo.shah@hostehainse.org	9813566335
86	Prof. Dr. Dilip Subba	dilipsubba2009@yahoo.com	9841551518; 014358917
87	Dr. Shankar P. Suri	drspuri@yahoo.com sdn@info.com.np	9851051144
88	Dr. Prem Thapa		
89	Mr. Prithbi Man Thapa	thapapm@gmail.com	9851155143
90	Mr. Ram Pratap Thapa	thapa@web.de	9851065565
91	Mr. Ram Singh Thapa	rstsila@gmail.com	9841161462
92	Dr. Manfred Treu	matr@wlink.com.np	9849402830
93	Er. Ashok Ratna Tuladhar	artuladhar@gmail.com	9841586599
94	Prof. Dr. Jyoti Upadhyaya Devkota	devkotajb@gmail.com	9842539845

95	Mr. Shree Ranjan Wasti	wasti333@yahoo.com	9841232828: 015211017
96	Mr. Abhinab Kadel	abhinab@outlook.com	9864474009 (viber)
97	Dr. Menuka Maharjan	Menuka48@maharjan@gmail.com	9841904369
98	Er. Sanjeev Kumar Raut	Sanjeevraut.4@gmail.com	9851188708
99	Er. Ravi Khanal	Ravikhanal2016@gmail.com	9849528647
100	Mr. Deepak Tolange	Revelation.deepak@gmail.com	9841526593
101	Mr. Sabin Dhakal	dhl.sabin@gmail.com	9851020474
102	Er. Ajay Sharma	sa.sharmaajaya@gmail.com	9813393067
103	Mr. Sanjit Shrestha	shresthasanjit@gmail.com	9851222364
104	Er. Heeraman Waiba	heeramanwaiba@gmail.com	98511644245
105	Er. Kalidas Neupane	kalidasneupane@gmail.com	9841705236
106	Er. Sharad Chandra Mainali	scm.sharad@gmail.com	9851185845

Annex 2: NEGAAS Executive Board

President

Prof. Dr. - Ing. Ramesh Kumar Maskey

Vice President

Er. Sandhya Regmi

Secretary

Ar. Rupesh Shrestha

Treasurer

Ms. Sabina Khatri

Executive Members

Prof. Dr. Tribikram Bhattarai

Dr. Rajendra Joshi

Dr. Babita Paudel

Ar. Sharmila Shrestha

Ms. Sushma Bajracharya

Mr. Rajendra Kumar karki

Mr. Simon Kumar Shrestha

Advisors

Dr. Roshana Shrestha

Mr. Surendra Dhakal



NEGAAS Organization Profile

Background

Nepal German Academic Association (NEGAAS) is a non-profit organization established in August 1986 by a group of Nepalese scholars having obtained their academic degree, undergone training and conducted researches in various universities and institutes of Federal Republic of Germany (FRG). NEGAAS aims at strengthening the relation between Nepal and Germany by developing mutual understanding and cooperation among the academicians of both the countries in social, scientific and technical fields.

Vision

Its vision is promoting Nepal-German Academic Relation.

Objectives

- To promote professional interests and scholarly communication among Nepalese scholars who have completed education in Germany.
- To support governments of both the countries in social, scientific and technical fields by providing them necessary and relevant information.
- To extend consultancy services to the projects in social, scientific and technical fields by the individuals, groups or government, firms, agencies etc. of Germany.
- To strengthen relation between institutions and individuals of the both countries through various formal and informal activities.
- To facilitate German researchers in Nepal by providing them information and orientation.
- To extend help to the Nepalese professionals working abroad who have completed their study in Germany, to Nepalese students still studying in Germany and prospective students who intends to carry out higher study in Germany.
- To promote German language and cultural activities.

Contact person :-

Ar. Rupesh Shrestha
Secretary

Nepal German Academic Association (NEGAAS)

E-mail: rupeshshrestha2005@gmail.com

Phone: +977 9841945089

Website:- <http://www.negaas.org.np/>