

*Quarterly Newsletter*

# AGRI-CONNECTION

December 2021 | Volume 6, Issue 4



Way to Mt. Everest  
<https://www.thestar.com/>

## HIGHLIGHTS

*"जननी जन्मभूमिश्च स्वर्गादपि गरीयसी"*

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कृषि कविता | पेज ३४



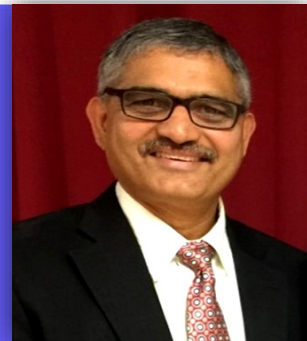
[napa2072@gmail.com](mailto:napa2072@gmail.com)

[WWW.NAPAAMERICAS.ORG](http://WWW.NAPAAMERICAS.ORG)

**PROSPERITY THROUGH AGRICULTURAL TRANSFORMATION**

# Message from the President

Dr. Megha N. Parajulee, NAPA President



Dear NAPA members and global friends,

Welcome to the 22<sup>nd</sup> issue of **NAPA Quarterly Newsletter, Agri-Connection**. As we bode farewell to 2021, I hope that our members have had a productive and rewarding year and wish you a Very Happy New Year 2022. The year 2021 was certainly a great year for NAPA that embarked on an ambitious NAPA Endowment Project. We surpassed the initial goal of generating \$100,000.00 endowment fund during the current executive term (2020-2022). Many thanks to the generosity of members and non-members who have placed enormous value in NAPA's vision, *Prosperity through Agricultural Transformation*, and support through a robust endowment program. The current momentum of endowment contribution and pledge suggests that NAPA is on the path of continued programmatic growth and financial sustainability. The Endowment Fund Advisory Board is developing strategies to enhance the current base fund, including strategic investment and fundraising. I trust that all of you join this effort and consider contributing to the NAPA Endowment Fund. A strong financial foundation will allow NAPA to serve its members well and align its programs and activities towards achieving its visionary goals.

I am witnessing that the Third NAPA Biennial International Conference (May 27-29, 2022; Atlanta, Georgia) is creating quite an excitement amongst members. The conference theme *Advancing Agriculture in a Changing World* is expected to capture current challenges facing the agricultural landscape, including the ongoing pandemic, climate change, biotechnological changes, and others. The ongoing pandemic may still be a concern to some quarters as travel and logistics may be adversely impacted. However, NAPA is committed to ensuring a robust hybrid program that includes sophisticated web-based conference as well as onsite meetings with all public safety measures in place. The member excitement is also reflected in the number of abstracts submitted to date, and we expect a record-breaking number of submissions by the new submission deadline of January 31. We are grateful to the Conference Organizing Committee and all volunteers who have worked tirelessly across various conference committees to make NAPA Conference 2022 a truly historic display of science, disciplinary integration, networking, competition, awards and honors, entrepreneurship, service, and professionalism. I urge all of you to submit abstracts and plan to attend this unique conference where all possible agricultural and allied disciplines are covered for a truly cross-cutting scientific discourse.

The Research Mini-Grant (RMG) program (NAPA-sponsored research funding and advisory service) during the 2020-2022 cycle has focused on research capacity building through undergraduate student research and training in Nepal. The RMG is one of NAPA's flagship programs that invests in preparing the next generation of young scientists, professionals, policymakers, and entrepreneurs. One of the highlights of NAPA Conference 2022 will be the Research Symposium of the 16 RMG awardees.

In closing, I would like to remind everyone that my presidential motto throughout this EC term is to encourage all NAPA members to connect, advocate, engage, and contribute to moving NAPA forward. I congratulate the A-C editorial team for another excellent newsletter to close the year 2021 and wish everyone a very happy and productive 2022. Be safe!

Agri-Connection is an effort of connection - a means of linkage among Nepali hearts worldwide.

For past issues of Agri-Connection, please visit the link below:

<https://www.napaamericas.org/newsletter.php>



## Editorial

The Himalayan country Nepal is extremely vulnerable to sundry natural calamities such as floods, landslides, fires, earthquakes, and thunderstorms. In mid-October 2021, most parts of the country were slammed by unseasonal heavy rains, damaging thousands of hectares of rice crops ready to harvest. Moreover, each year, floods and landslides cost hundreds of lives, destroy buildings and infrastructure, and stymie economic activity. Despite massive investments from both the public and private sectors in disaster risk preparedness and management, attempts to mitigate major disaster risks have been largely unsuccessful. Therefore, more effective prevention, protection, mitigation, response, and recovery activities that fortify individual and collective preparedness are imperative at all levels.

In this backdrop, with the theme of “Advancing Agriculture in the Changing World”, NAPA is hosting the 3<sup>rd</sup> Biennial International Scientific Conference from May 27 to 29, 2022 in Atlanta, Georgia. The conference expects scientists, students, farmers, and policymakers to join a common platform and work together in developing various long-term and short-term strategies that improve food production in the face of climate change. As a highlight, this issue includes an article on climate change adaptation strategies for growing rice in Nepal. The other two articles, agro-forestry for resilient and sustainable agriculture, and 3-G cutting technology in cucurbit crops make this issue very special to our readers. This issue also summarizes NAPA’s initiatives and achievements on organizational development, networking, research funding, and philanthropy. The KidsZone is contributed by many artistic and creative kids. We also have featured a story of collective efforts on agricultural entrepreneurship in Nepal.

We encourage and invite you to be a part of Agri-Connection by reading, writing, and sharing your thoughts. May your holiday season be fun-filled and adventurous, and so be your life.

**Happy New Year 2022!!**

## AGRI-CONNECTION

### Editorial Board



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*Editor-in-Chief*



**Dr. Prakriti Bista**  
*Editor*



**Mr. Sanjok Poudel**  
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**Dr. Sita Thapa**  
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**Mr. Tikaram Wagle**  
*Nepali Editing*

# AGRI-CONNECTION

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What is right is not always popular and what is popular is not always right - Albert Einstein



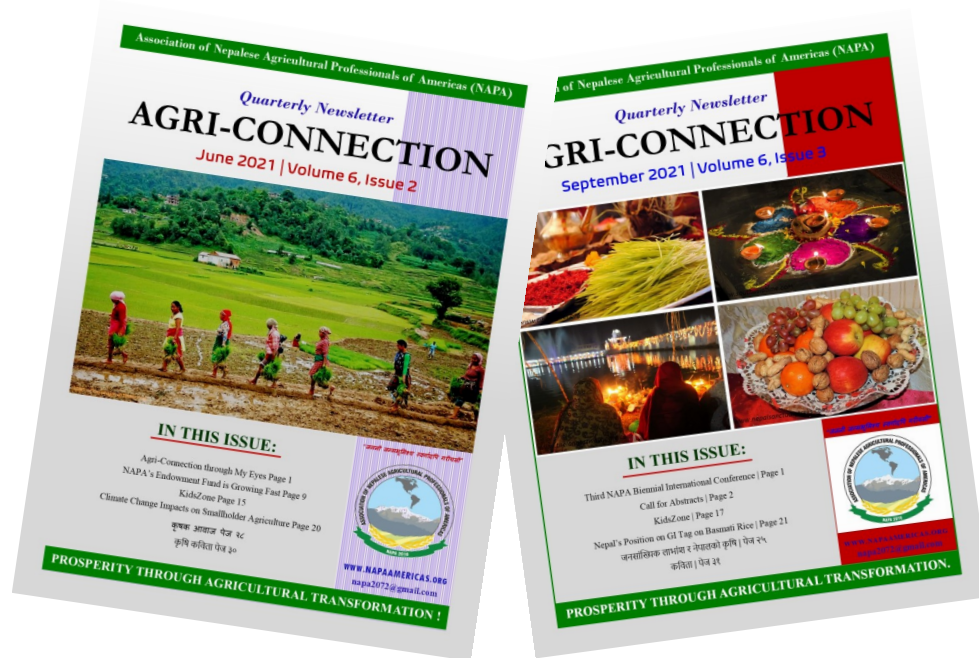
# Agri-Connection through My Eyes

**Dr. Lila B. Karki**  
(Immediate Past President, NAPA)



Agri-Connection (AC), the online newsletter of NAPA kicked off its global journey five years ago. NAPA professionals engaged in bringing the AC out to its valuable members and beyond to educate and keep the readers informed about its professional activities and services around the globe. The AC has reached its readers' hearts and minds with its content published in various issues about teaching, education, outreach, and research. It is growing incredibly every quarter and serving its regular and potential audience through various news, informative articles, services, and announcements. The quality of the newsletter is enriched by the informative and valuable contents in each issue. I salute the dedication and commitment of the editorial team since 2016, led by Drs. Ramesh Khanal, Nityananda Khanal, and Sushil Thapa for bringing cherished versions every quarter. I congratulate their dedicated team members for reaching out to hundreds of authors and co-authors and simultaneously serving thousands of readers from various walks of life across the globe.

“I have found the AC a professional mirror connecting NAPA to the world.”



## Please Stay Connected with NAPA Community



<https://www.facebook.com/napa2072>



<http://napaamericas.org>

<https://www.facebook.com/NepaleseAgriculturistAmericas>

Please save the date!!

**NAPA proudly announces**



**3<sup>rd</sup> NAPA BIENNIAL  
INTERNATIONAL SCIENTIFIC  
CONFERENCE**

**MAY 27-29, 2022 (MEMORIAL WEEKEND)**

*“Advancing Agriculture in a Changing World”*

**VENUE:**



**SONESTA**  
HOTELS AND RESORTS

**SONESTA ATLANTA AIRPORT NORTH**  
1325 Virginia Avenue  
Atlanta, GA 30344, USA



**For more information:**

[www.napaamericas.org/conference-2022.php](http://www.napaamericas.org/conference-2022.php)





**NAPA 2022**  
3<sup>rd</sup> BIENNIAL INTERNATIONAL  
SCIENTIFIC CONFERENCE  
MAY 27-29, 2022 ATLANTA, GA, USA

## Call for Abstracts

### Dear all valued NAPA members and beyond,

Association of Nepalese Agricultural Professionals of Americas (NAPA) Conference Organizing Committee (COC) is pleased to announce the call for abstracts for the 3<sup>rd</sup> NAPA Biennial International Scientific Conference with the theme “**Advancing Agriculture in a Changing World.**” This call solicits abstracts for oral and poster presentations. Abstract submitted should be within the disciplines of Agricultural and Allied Sciences and should fit under the topics listed below. Abstract, focused directly or indirectly to achieve sustainable supplies of food, feed, fuel, and fiber (4F) to meet the need of current and future generations are strongly encouraged.

Graduate and undergraduate students are encouraged to indicate their interest in participating in oral and poster competitions in the submission form. There will be an opportunity to publish selected research papers in NAPA’s Global Journal of Agricultural and Allied Sciences (GJAAS).

The abstract should be limited to **250-300** words. Please adhere to the following format when submitting an abstract:

### Topic Areas (including but not limited to)

**Crop and Soil Sciences:** Agronomy; Soil Science; Horticulture; Viticulture and Enology; Plant Pathology; Entomology; Plant Breeding and Genetics; Molecular Biology; Crop/Biotech Engineering and Technology; Agrobiodiversity; Weed Science; Smart/Digital/Precision Farming Practices .

**Animal, Veterinary, and Aquaculture Sciences:** Animal Sciences; Animal Behavior and Welfare Science; Comparative and Veterinary Medicine; Aquaculture; Animal/Biotech Engineering and Technology; Animal Production and Management.

**Social Sciences:** Agricultural Education; Agricultural and Resource Economics; Agricultural and Rural Sociology; Sociology of Agriculture; Agricultural Statistics and Research Methods; Food Security; Gender in Agriculture; Migration; Remittances and Agriculture; Subsistence Farming and Rural Livelihoods.

**Allied Sciences:** Forestry/Agroforestry; Meteorology/Climate Science; Natural Resources Management; Food and Nutrition Sciences/Technology; Water and Environmental Sciences; Agricultural Statistics and Research Methods; Biomedical Sciences; Polymers in Ag-

riculture; Sustainable Agriculture; Organic Farming; Agricultural Engineering; and any related disciplines.

All abstracts should be submitted through the online submission system available on the conference website: <https://www.napaamericas.org/conference-2022.php>.

### Important Dates

**Abstract due date: January 31, 2022**

**Notification of abstract acceptance: March 1, 2022**

**Conference date: May 27-29, 2022**

### Travel Support

A limited number of travel grants (registration and/or accommodation; no airfare support) may be available to support students and young scholars from developing countries. Scholars from outside North America and any student member who would not be able to attend the conference in-person will have an opportunity to attend and/or present papers/posters virtually.

### Best Oral/Poster Presentation Award for Students

*The three outstanding oral and poster presentations, each, will be awarded a cash prize of \$250, \$150, and \$100 for first, second and third positions, respectively, along with a certificate of appreciation.*

### Please submit:

**Paper Title:**

**Author(s) and Affiliation(s):**

**Email of Corresponding Author:**

**Presenting Author:**

**Discipline:** Select the most applicable discipline from the list

**Keywords:** Enter three to five keywords

**Abstract:** Include a brief introduction, objective(s), methods, results/expected results, and discussion and conclusions.

**Font Type and Size:** Times New Roman; 12 points

**Margin:** 1 inch all sides

**Line Spacing:** Single



## NAPA 2022 3<sup>rd</sup> BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE

MAY 27-29, 2022

ATLANTA, GA, USA

### Call for Essay/Student Writing Contest

Association of Nepalese Agricultural Professionals of Americas (NAPA) Conference Organizing Committee is pleased to announce the call for 2022 College and University Students' Essay Writing Contest for its 3<sup>rd</sup> Biennial International Scientific Conference (<https://www.napaamericas.org/conference-2022.php>). A full-time student enrolled in a college, including community or vocational college, and/or university around the globe pursuing a degree in agricultural or allied fields is eligible to participate.

**Essay Topic: "Advancing agriculture for global food security and prosperity in a changing world"**

#### General guidelines

- The essay should be written in English language.
- The essay must be author's original work and should be attested by inserting a statement followed by author's full name.
- The essay should follow the standard academic essay structure and format that includes a concise abstract followed by an introduction with a thesis statement(s) along with logically organized body of supporting arguments using headings/sub-headings leading to a conclusion(s) and future perspectives.
- The essay can be developed based on student's own experience, online research, and scientific literature review.
- Appropriate credits must be given to the work of others through appropriate citation. The essay will be disqualified for the competition if any evidence of plagiarism is established. The committee strongly discourages plagiarism of any form and advises students to avoid engaging in such activity.
- The essay should include a complete list of references cited in the reference section. The references should be formatted using APA style (<http://www.apastyle.org/>), examples are available at the reference section of NAPA's journal website:

<https://giaas.org/index.php/GJAAS/authorGuideline>.

- The essay should not exceed 3,000 words, excluding footnotes, tables, figures, and references. The texts should be formatted double-spaced, and 12-point Times New Roman font size. Margin should be 2.5 cm (1 inch) on all sides.
- The essay should have author's name, affiliated college and/or university, degree program, mailing address, and email ID. A proof of student status is required (e.g., student ID card with an expiration date or unofficial transcript or a letter from the college or university certifying the student's full time status on or before the closing date).
- A pdf or word copy of the essay must be uploaded online at: <https://www.bitly.com/NAPA-SWC>. The pdf or word file should be named "NAPA\_2022\_SWC\_STUDENT\_FULL\_NAME\_COLLEGE\_OR\_UNIVERSITY\_NAME."
- The deadline for submission is **January 31, 2022**.
- Only one essay can be submitted per contestant. The results of the essay writing contest will be notified only to the winners prior to the conference.
- The first, second, and third place winners will be awarded with a certificate and cash prizes of \$250, \$150, and \$100, respectively at the conference during May 27-29, 2022 in Atlanta, Georgia, USA. Winners are encouraged (but not required) to be physically present at the award ceremony.

If you have any questions/concerns, please contact **Dr. Bharat Pokharel, Chair, Student Writing Contest Committee** at [Bharat.Pokharel@gmail.com](mailto:Bharat.Pokharel@gmail.com).

**All full-time students are highly encouraged to participate in this contest.**





# NAPA 2022

## 3<sup>rd</sup> BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE

MAY 27-29, 2022

ATLANTA, GA, USA

## कृषि कविता प्रतियोगिता सम्बन्धी सूचना !

नापाको द्विवार्षिक वैज्ञानिक अधिवेशन (मे २७-२९, २०२२) मा संचालन गरिने कृषि-कविता गोष्ठीमा सहभागी हुन सम्पूर्ण साहित्य प्रेमी कवि-कवियत्रीहरूलाई हार्दिक अनुरोध गर्दछौं । इच्छुक सर्जकज्यूहरूले आफ्नो मौलिक कृषि कविता "प्रतियोगी" वा "अप्रतियोगी" श्रेणी निर्दिष्ट गरी यही मार्च ३१, २०२२ सम्ममा तलको ठेगानामा पठाउनुहुन अनुरोध छ ।

### प्रतियोगिताका नियमहरू:

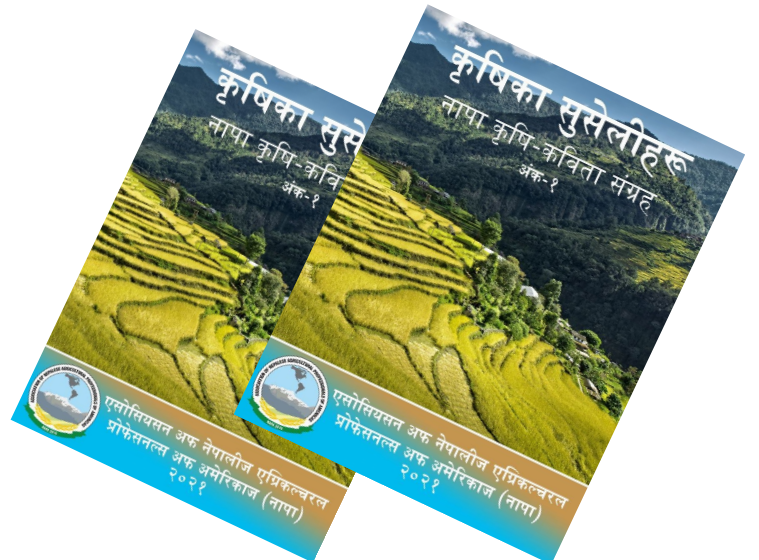
१. कविता कृषि तथा सम्बद्ध विषयसंग आधारित हुनुपर्नेछ ।
२. कविता शुद्ध नेपाली भाषामा २०० शब्दमा नबढाइ लेखिएको हुनुपर्नेछ ।
३. प्रतियोगिताको दिनमा श्रष्टा आफैले कविता वाचन गर्नुपर्नेछ ।
४. तीन सदस्यीय निर्णायक समितिले कविताको मूल्यांकन गर्नेछ ।
५. उत्कृष्ट प्रथम, द्वितीय र तृतीय कवितालाई क्रमशः \$२००, \$१५०, र \$१०० पुरस्कार तथा प्रमाणपत्रले सम्मान गरिनेछ ।
६. प्रतियोगितामा सहभागी कविताहरूमा नापाको सर्वाधिकार रहनेछ ।
७. कविताका साथमा लेखकको छोटो परिचय र एउटा फोटो समेत समावेश गर्नुपर्नेछ ।
८. प्रतियोगितामा सहभागी कविताहरू नापाको "कृषिका सुसेलीहरू" संगालोमा प्रकाशन गर्न सकिनेछ ।
९. कविता आगामी मार्च ३१, २०२२ भित्र निम्न ठेगानामा पठाउनु पर्नेछ:

### कविता पठाउने ठेगाना:

[agripoemnapa@gmail.com](mailto:agripoemnapa@gmail.com)

डा. मनोज कार्की

संयोजक, नापा कृषि कविता गोष्ठी २०२२





## NAPA 2022

### 3<sup>rd</sup> BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE

MAY 27-29, 2022

ATLANTA, GA, USA

## Appeal for Conference Sponsorship

The NAPA 3<sup>rd</sup> Biennial International Scientific Conference Organizing Committee is working hard to make the conference a grand success. The conference will be held during May 27-29, 2022 in Atlanta, Georgia, USA on the theme ‘**Advancing Agriculture in a Changing World.**’ For details, please visit <https://www.napaamericas.org/conference-2022.php>. This is a great scientific platform for students, academicians, and professionals who are engaged in but not limited to teaching, research, extension, community development, and entrepreneurial activities in the field of Agricultural and Allied Sciences across the world to attend and present papers/posters in-person or virtually and win various awards as presented below. The **conference registration fee will be nominal to allow an opportunity for maximum participation of students and early career professionals.** Primary source to fund these awards is through the generous support from our sponsors and/or members. You have opportunities to donate any of the designated levels or sponsor an event/prize in **your name or name of beloved ones.** We appreciate and welcome any amount of donations to recognize and reward great minds at this historic conference.

#### Events sponsorship opportunities (Amount in USD):

Events	First Prize	Second Prize	Third Prize	Event Total
Student Oral Presentation	250	150	100	500
Student Poster Presentation	250	150	100	500
Student Essay Writing Contest	250	150	100	500
Agri-Poem Contest	250	150	100	500
Student Rapid Fire Competition	50	30	20	100
Hotel Accommodation (Room) Sponsorship	One room for 1 night (\$99), One room for 2 nights (\$198), One room for 3 nights (\$297)			

**Sponsorship levels:** ≥\$1,000: Platinum; \$500-\$999: Diamond; \$300-\$499: Gold; \$100-\$299: Silver; \$50-\$99: Bronze; <\$50: Green (Please note: “**NAPA donations are tax deductible**”).

#### Donations can be paid in three different ways:

**Free electronic wire transfer** using **Zelle** from several major banks in the USA to [napa2072@gmail.com](mailto:napa2072@gmail.com). Please write the purpose of payment – (e.g., donation for NAPA Biennial Conference, event name, and name of sponsor or your beloved ones).

**PayPal or Credit/Debit Cards:** Click the **donate** button on the NAPA website (<http://napaamericas.org/donate.php>) and pay using PayPal or Credit/Debit Cards. Please write the purpose of payment in the ‘additional information’ box.

**Mail a Check:** Please contact NAPA ([napa2072@gmail.com](mailto:napa2072@gmail.com)) to mail a check.

### Please find the information about our past conferences:

The Second Conference (2020): <https://napaamericas.org/conference-2020.php>

The First Conference (2018): <https://napaamericas.org/conference2018/index.php>

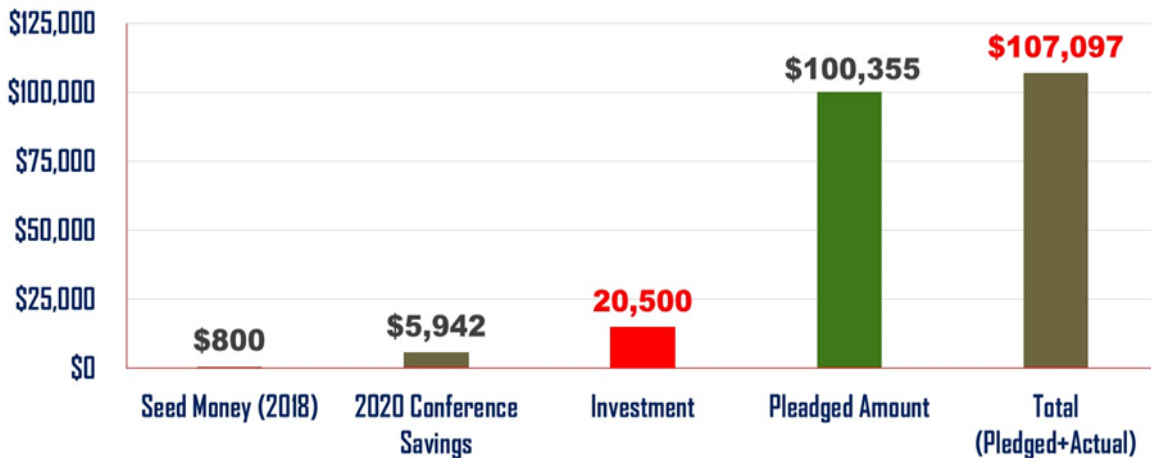


## NAPA Endowment Fund Update

### Pledge and progress

Since the formal establishment of the NAPA Endowment Fund in January 2021, with the goal of achieving NAPA's economic and programmatic sustainability, as of December 15, 2021, the 50 generous sponsors (24 females and 26 males) have pledged a total amount of \$100,355.00 in the Endowment Fund.

### NAPA's Endowment Fund (in US Dollar)



As of December 2021, the Endowment Fund consisted of \$107,097.39. This amount includes first year's pledged deposit \$15,825.00, a cash from previous sources (seed money and 2020 conference saving) and the remaining commitment \$84,530.00 to be deposited to EFAB account in the years ahead.

To date, EFAB is pleased to report that the invested \$20,500.00, has started generating return on Vanguard's index funds (<https://investor.vanguard.com/corporate-portal/>).

For further information and feedback, please contact at [napaendowmentfund2021@gmail.com](mailto:napaendowmentfund2021@gmail.com).

## Appreciation to Endowment Fund Donors

NAPA community is growing steadily with an increasing number of members from a wide range of agricultural disciplines and geographical regions. Foreseeing its further expansion over time, it is imperative to have a system of regular funding sources to ensure continued NAPA activities. Such financial safety can be achieved via a carefully managed Endowment Fund. Endowed fund principal is not to spend; instead, the earnings from the endowment investments help the programs you choose to implement. In other words, each gift designated for endowment provides NAPA with a permanent financial support/source. Considering this fact, NAPA established Endowment Fund (<https://www.napaamericas.org/endowment.php>) in 2017, and the current Executive Committee formed an Endowment Fund Advisory Board that has oversight of this fund. Any NAPA members and interested generous individuals may contribute to this fund. Several NAPA members have already pledged for this endowment fund.

On behalf of the NAPA, the Endowment Fund Advisory Board (EFAB) extends its sincere appreciation to all the generous sponsors for your timely deposit of your first-year installment to the EFAB bank account. ***Your dedicated contribution and commitment will make NAPA's growth and program sustainable in the near future.***

**Thank you for your valuable contribution to the organization!**

# Appeal for Contribution to NAPA Endowment Fund



## ENDOWMENT FUND ADVISORY BOARD

~ESTD. 2020~

### Chair

Dr. Lila B. Karki

### Director

Dr. Megha N. Parajulee

### Director/

### Member Secretary

Dr. Prem B. Bhandari

### Outreach &

### Investment

### Coordinators

Dr. Basu D. Bhandari

Dr. Aditya R. Khanal

Dear Sir/Madam:

The Endowment Fund Advisory Board (EFAB) of the Association of Nepalese Agricultural Professionals of Americas (NAPA) sincerely requests you to consider a donation to its **Endowment Fund**. Your donations to the endowment fund would help NAPA achieve its overarching goal, “*Global Food Security through Agricultural Transformation*.” NAPA is a non-profit, non-governmental, non-religious, and non-political professional organization dedicated to serving humanity through scientific research, teaching, outreach, and charitable initiatives in agricultural and allied disciplines. Since its inception in 2016, NAPA has implemented outstanding programs such as international scientific conferences, scholarships, research mini-grants, webinars, seminars and workshops, peer-reviewed journal, Global Journal of Agriculture and Allied Sciences (GJAAS), a seminal book on food security, research and policy briefs, and Agri-Connection – an online quarterly newsletter.

To facilitate and expand its endowment fund, originally initiated in 2017, envisioning the economic and programmatic sustainability of this emerging organization, the NAPA Executive Committee has established an Endowment Fund Advisory Board in January 2021. The EFAB envisages utilizing the endowment revenue to sponsor NAPA's flagship programs, prioritizing donor-specified activities

**Within a year of its establishment, Endowment Fund Advisory Board has already received a pledge commitment of US \$100,355.00 as of December 31, 2021.**

while allowing the principal to grow through its productive investment strategies.

You can contribute to this noble cause by establishing the fund in your name or your beloved ones'. As a contributor, you can also express your activity of interest to NAPA, consistent with NAPA's mission and vision. It is an incredible opportunity for you to contribute to this cause through an upfront donation or any amount on a monthly or annual basis for any number of years, based on your interest and willingness. **Donations to NAPA endowment funds are tax-deductible.** Our Endowment Fund Donation Recognitions/Tiers are:

Platinum Sponsor ≥\$10,000	Diamond Sponsor ≥\$7,000
Gold Sponsor ≥\$5,000	Silver Sponsor ≥\$3,000
Bronze Sponsor ≥\$1,000	Green Sponsor ≥\$500
Valued Sponsor or Supporter <\$500 (allocated to common/pool fund)	

The endowment fund's beauty is that a sponsor may customize the donation as a single or multiple installment(s) over the years. The tiered recognition level may scale up anytime your support reaches the designated tier, as mentioned above. The EFAB assures you that every donation to this fund will be maintained, managed, and utilized transparently. Thank you in advance for your solidarity. We look forward to receiving your generous pledge for the endowment fund. We highly appreciate your continued support to NAPA. For more information, please visit: <https://www.napaamericas.org/endowment.php>.

Thank you everyone!

**Endowment Fund Advisory Board**



## Photographs in Action



**Photograph I:**

Sugar beet cyst nematode (white pinhead size females within black circle) in a sugar beet root.

*Source: Sita Thapa*



**Photograph II:**

Field trial evaluating different types of compost to manage sugar beet cyst nematode on sugar beets.

*Source: Sita Thapa*



**Photograph III:**

Infrared thermometers (IRTs) used to measure wheat canopy temperature in the Texas High Plains.

*Source: Sushil Thapa*



**Photograph IV:**

Rainwater harvesting pond in hilly area of Dang, Nepal.

*Source: Bipin Khatri*

Please take a picture and share it with us.

Email: [agricconnection2072@gmail.com](mailto:agricconnection2072@gmail.com)

cc: [ag.sushilthapa@gmail.com](mailto:ag.sushilthapa@gmail.com)



# Legal Issues, Visa Status, Work Eligibility, and Permanent Residency

Event organized by Student Coordination Committee (SCC)

Nepalese students studying in the U.S. not only have to worry about graduation, but also need to work towards pursuing immigration status for a career ahead. Enhancing awareness helps students acquaint themselves with strategies and plans to secure legal status and career in the U.S. For this reason, the student coordination committee (SCC) of the Association of Nepalese Agricultural Professionals of Americas (NAPA) hosted a panel discussion on legal issues, visa status, work eligibility and permanent residency on October 31, 2021. The event was moderated by Bikash Ghimire (Co-chair, SCC) and Shubhechchha Sharma (Chair, SCC).

Shiva Khanal, Founder and Attorney, Law Office of Shiva Khanal Manhattan and Long Island, New York, was the resource person for the event. Mr. Khanal discussed various aspects of maintaining F-1 Status, F-1 reinstatement, work authorization (OPT, CPT, H1B), employment-based immigration (EB1, EB2), green card application, and a pathway to citizenship. Around 60 attendees participated in the webinar and asked questions to clarify their queries. The common questions were related to timing and eligibility for OPT and NIW. Based on the discussions during the program and feedback from the participants, the program was a success and encouraging for NAPA and SCC to conduct more webinars series beneficial to students in the coming days.

*(Report prepared by SCC member Sujan Bhattarai, and revised by SCC Chair Shubhechchha Sharma and SCC Advisor Santosh Dhakal)*

**Association of Nepalese Agricultural Professionals of Americas (NAPA)  
& Student Coordination Committee (SCC) Present**

**“Legal Issues, Visa Status, Work Eligibility, and Permanent Residency”**



**Resource Person: Shiva Khanal, ESQ**  
Founder and Attorney  
Law Office of Shiva Khanal  
Manhattan and Long Island Office, New York



**USA Time:**  
October 31, 2021 (Sunday)  
7:15 PM CST

**Nepal Time:**  
November 1, 2021 (Monday)  
(कार्तिक १५, २०७८)  
6:00 AM



**Moderator: Bikash Ghimire**  
Co-chair, SCC  
The University of Georgia, Griffin Campus

**Open only to NAPA Members**      **Meeting link will be sent prior to the event**

Agri-Connection Editorial Board invites and encourages you to send us your articles, intellectual ideas, opinions, thoughts, perspectives, memoirs, and literary creations.

**Email: [agricconnection2072@gmail.com](mailto:agricconnection2072@gmail.com)  
[ag.sushilhapa@gmail.com](mailto:ag.sushilhapa@gmail.com)**

## Research and Capacity Building Committee (RCBC) Updates

Prepared by Dr. Nityananda Khanal, Chair, RCBC

During the year 2021, the Resources and Capacity Building Committee (RCBC) held several meetings to discuss the aspects of resource generation, collaboration, outreach, and administration of Research Mini-Grant (RMG). The RCBC organized RMG-focused various activities during 2020-2021. The current RMG program started with the call for proposals on November 1, 2020, with the proposal submission deadline of December 31, 2020. In this call, undergraduate students in the agriculture and allied sciences programs in Nepal were the exclusive target groups for funding. An interactive question-answer session was organized for prospective research mini-grant applicants on November 15, 2020. Altogether 43 RMG proposals from undergraduate students went through a double-blind review leading to the selection of 16 proposals for funding. Following the award decision and notification to the applicants and their local academic supervisors on February 10, 2021, agreements were executed and the first installments of the fund were released. Then, a series of research orientation and capacity building sessions were organized for the RMG recipients as follows:

- RMG introductory session: March 4, 2021
- Research & Publication Ethics: March 11, 2021
- Experimental & Social Research Design: April 23, 2021
- Survey and Questionnaire Design: July 2, 2021
- Project Status Review Meeting: July 30, 2021
- Some Good Practices in Statistical Analysis: August 20, 2021.

Drs. Megha N. Parajulee, Pradeep Wagle, Ramjee Ghimire, Prem Bhandari, Bharat Pokharel, Chakra Budhathoki served as resource persons in various orientation sessions. Dr. Pramod Pokhrel conducted most of the sessions.

In the last quarter, a mid-term progress review and presentation of the RMG projects was held on October 8, 2021. The RMG recipients submitted their mid-term progress reports before the presentation workshop. Based on the project reports and presentations, 15 RMG recipients had made some progress in their research projects, which ranged from initiation to completion of the survey or experimental activities. The COVID-19 pandemic posed challenges in project activities causing delays in the project timelines and milestones. Despite challenges, the project accomplishments by the students were satisfactory. However, one of the grant recipients was not been able to initiate project work due to the COVID-19 pandemic and returned the project fund to NAPA. Following the project review, the second installment of the fund has been disbursed to the RMG recipients. It is expected that all 15 projects will be substantially completed by February 2022. After consultations with the RMG recipients, a final project completion and review reporting and presentation workshop will be held in February 2022. The RMG recipients are encouraged to submit abstracts for their presentation in the upcoming 3<sup>rd</sup> NAPA International Scientific Conference, to be held on May 27-29, 2022. A Research Mini-Grant Symposium will be a part of the Conference, where all RMG participants will have the opportunity to present their research findings.

## Appeal to Support NAPA Initiatives

- **Research Mini-Grant:** <https://www.napaamericas.org/donate.php>
- **Scholarship Fund:** <http://napaamericas.org/napa-scholarships-sponsors.php>
- **Endowment Fund:** <http://napaamericas.org/endowment-fund-announcement.php>

## NAPA Webinar Series 26 and 27

### Webinars organized by Webinar Committee (WC)

The Webinar Committee (WC) hosted two important webinars during this quarter. The 26<sup>th</sup> Webinar Session was held with **Dr. Rajan Ghimire**, Assistant Professor of Cropping Systems and Soil Management at New Mexico State University, in New Mexico, USA. Dr. Ghimire discussed the relationship between soil organic carbon and soil health, and methods to improve soil carbon sequestration. He mentioned four areas of soil health challenges in Nepal, 1) Low soil productivity, soil acidification and fertility loss, 2) Erosion, landslides, and other forms of soil degradation, 3) No benchmark soil health data for the diverse landscape of Nepal, and 4) Limited efforts on soil testing and management. Towards the end, Dr. Ghimire talked about the prospects of translating soil health and carbon management knowledge and practices to the context of Nepalese farming.



Association of Nepalese Agricultural Professionals of Americas (NAPA) presents  
**NAPA Webinar Series: 26**  
**“Soil Health and Carbon Management in Agroecosystems”**

   
**Dr. Rajan Ghimire**  
 Assistant Professor, Cropping Systems & Soil Management  
 New Mexico State University

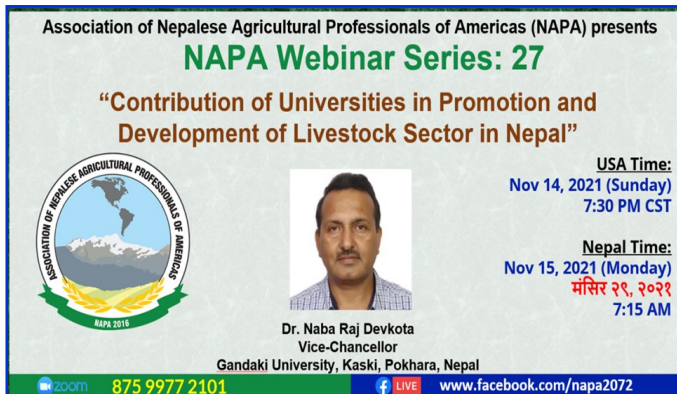
**USA Time:**  
 October 3, 2021 (Sunday)  
 7:45 PM CST  
**Nepal Time:**  
 October 4, 2021 (Monday)  
 (असोज १८, २०७८)  
 6:30 AM

zoom 875 9977 2101 LIVE www.facebook.com/napa2072



#### Key message from Dr. Ghimire:

- Soil health is the state of the soil being in sound physical, chemical, and biological condition and having the capability to sustain the crop production without negative impacts to the other ecosystem services it provides.
- Soil health emphasizes a holistic approach for managing carbon and nutrients.
- Soil health improvement is critical for agricultural sustainability in low productivity arid and semiarid environments.
- Multiple soil health practices can increase soil carbon, improve soil health, and mitigate climate change.
- A participatory soil health testing and management system are required to improve overall soil fertility and crop productivity.

The 27<sup>th</sup> Webinar Session was held with **Dr. Naba Raj Devkota**, Vice-Chancellor at Gandaki University in Pokhara, Nepal. Dr. Devkota discussed the role of Universities in the promotion of livestock sector in Nepal. He highlighted the number of universities/institutes, their programs, availability of human resources, and livestock-related policies and plans in the country.



Association of Nepalese Agricultural Professionals of Americas (NAPA) presents  
**NAPA Webinar Series: 27**  
**“Contribution of Universities in Promotion and Development of Livestock Sector in Nepal”**

   
**Dr. Naba Raj Devkota**  
 Vice-Chancellor  
 Gandaki University, Kaski, Pokhara, Nepal

**USA Time:**  
 Nov 14, 2021 (Sunday)  
 7:30 PM CST  
**Nepal Time:**  
 Nov 15, 2021 (Monday)  
 मंसिर २९, २०७९  
 7:15 AM

zoom 875 9977 2101 LIVE www.facebook.com/napa2072

#### Key message from Dr. Devkota:

- The livestock sector contributes 11.5% of the total national GDP and 25.7% of agricultural GDP.
- The number of livestock especially, chicken, swine, and goats have raised over the years contributing to egg and meat production.
- Nepal made remarkable progress on artificial insemination (AI) in animals, and the production of high-yielding breeds of cattle, buffalo, goat, swine, and chicken.
- Many graduates do not enter or return to livestock production jobs, therefore there is a serious deficit of agricultural graduates working in the field and livestock production in Nepal.
- There is a lack of common venues and collaborations among the livestock experts and technicians in the changed federal context.
- Further commercialization of the livestock sector and agro-based industries is necessary.

The events were coordinated by a Webinar Committee Chair, Dr. Khushi Ram Tiwari, teaming up with Dr. Ramjee Ghimire, Dr. Dilip Panthee, and Mr. Maha P. Gelal. NAPA President Dr. Megha N. Parajulee welcomed the speakers and participants, and NAPA Vice-President Dr. Pradeep Wagle delivered the vote of thanks.



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### Information Technology (IT)

Dr. Dev Paudel



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Dr. Khushi Ram Tiwari

#### Members

Dr. Dilip Panthee  
Mr. Maha P. Gelal

## NAPA Membership Updates

Member Category	Members
Founding Life	5
Regular Life + Senior life	101
General/Regular	26
Student	152
Associate Life, International	5
Associate Life, Nepal	61
Associate, International	2
Joint Life	4
Family/Joint	14

**Welcome New NAPA Members on Board!**

### Student Member

Mr. Abhishesh Bajracharya, University of Mississippi

Mr. Dinesh Poudel, North Dakota State University

Ms. Kajol Pradhan, Tennessee State University

Mr. Nabin Bhandari, Auburn University

Ms. Namrata Acharya, North Dakota State University

Ms. Rachana Pandey, West Virginia State University

Mr. Raju Sapkota, Eastern New Mexico State University

Ms. Sanchita Budhathoki, Oklahoma State University

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Dr. Mahendra Bhandari, Texas

Dr. Pratap Kafe, New York

### Life Member

Dr. Keshav Timilsina Sharma, Minnesota

## Do you know NAPA Publishes a Journal?

Global Journal of Agricultural and Allied Sciences (GJAAS) is a multi-disciplinary, peer-reviewed (double-blind) international journal published by NAPA

Please consider this journal for your future publications.

For further information, please visit: <https://gjaas.org/index.php/GJAAS>

## PRINCIPLES AND PRACTICES OF FOOD SECURITY

SUSTAINABLE, SUFFICIENT, AND SAFE FOOD FOR HEALTHY LIVING IN NEPAL

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Prem B. Bhandari

Editors  
Uma Karki, Megha N. Parajulee,  
Ram N. Acharya, and Raju Adhikari



ASSOCIATION OF NEPALESE AGRICULTURAL PROFESSIONALS OF AMERICAS (NAPA), USA

NAPA has recently published a book entitled:

"Principles and Practices of Food Security: Sustainable, Sufficient, and Safe Food for Healthy Living in Nepal.

**Please save your copy today!**

Contact NAPA for further information.

***"Prosperity through Agricultural Transformation"***



Congratulations, Mr. Bhuwan Shrestha, NAPA student member, for securing the First Position at Graduate poster competition held at the 79th Professional Agricultural Workers Conference (PAWC) at Tuskegee University, Tuskegee, Alabama.

Poster title: Prevalence of Gastrointestinal Parasites on Lactating Kiko does and their Kids in Woodlands with Supplements.

Major advisor: Dr. Uma Karki

## Where to deposit your contribution to NAPA?

**Business Name:** Association of Nepalese Agricultural Professionals of Americas

**QuickPay® with Zelle® payment:** napaendowmentfund2021@gmail.com

**Memo:** Write 'NAPA endowment fund.'

**For details:** Please contact NAPA at napaendowmentfund2021@gmail.com or

NAPA treasurer Dr. Santosh Dhakal at santoshdhakal88@gmail.com



## Appeal to Join/Renew NAPA Membership

We would like to request potential members to join NAPA - a **common professional platform for all of us**. Meanwhile, we request all members who are not currently in good standing to renew their memberships. Members' contributions thus far to bring NAPA to the current level is greatly appreciated. We request our dedicated members and well-wishers to promote NAPA to the next level by recruiting eligible friends/colleagues/students in your network. New NAPA members must write the recruiter's name in the "referred by" row in the membership form. **The highest three recruiters will be recognized at our Biennial Scientific Conference.**

### **A few reasons to join/renew NAPA membership:**

NAPA is a member-driven voluntary organization. Members can benefit from the association to advance their career growth, develop organizational practices and leadership skills at all stages. Some of the membership benefits include:

- Peer-to-peer networking and research collaboration opportunities
- Professional development and advancement
- Serving on various committees
- Opportunity to publish scientific works in NAPA's various outlets (Journal, Book, Research/Policy Brief, and Agri-Connection)
- Opportunity to sponsor scholarships and research mini-grants in preferred agricultural institutions and disciplines in Nepal through NAPA
- Eligibility for organizational awards, scholarships, and endowment funds
- Opportunity to share scientific works, experiences, and expertise via association's Talk Sessions (Webinars) and Online Teaching/Learning Programs
- Joining global expert repository to contribute to Nepalese Agriculture and beyond
- Keeping up-to-date on association's programs and activities
- Volunteering and charitable opportunities
- Discounted rates for registration and hotel reservation during scientific conferences organized by the association

The life membership fees have been adjusted from \$500.00 to \$200.00 (\$300.00 for eligible couples) to encourage eligible members to become life member of the organization. Please check for more details on Joining NAPA at <http://napaamericas.org/join-napa.php> and membership type and fees at <http://napaamericas.org/membership.php>. We look forward to welcoming you for a great cause. Please let us know if you have any questions and willingness to volunteer in various committees.



Thank you.

On behalf of NAPA Executive Committee,  
Dr. Pradeep Wagle  
Vice President

Chair, Membership Drive Committee

Email: [napa2072@gmail.com](mailto:napa2072@gmail.com)

**BECOME A  
MEMBER**  
JOIN TODAY!

**Renew now**

**Please join or renew your membership. Become a life member if possible!**

## KidsZone

### A visit to the Garden City Zoo

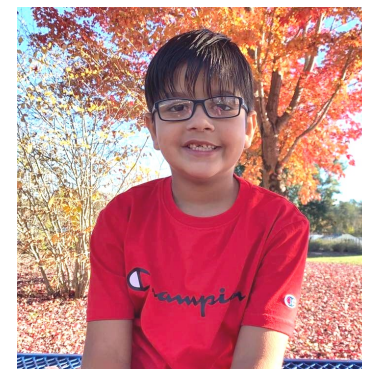
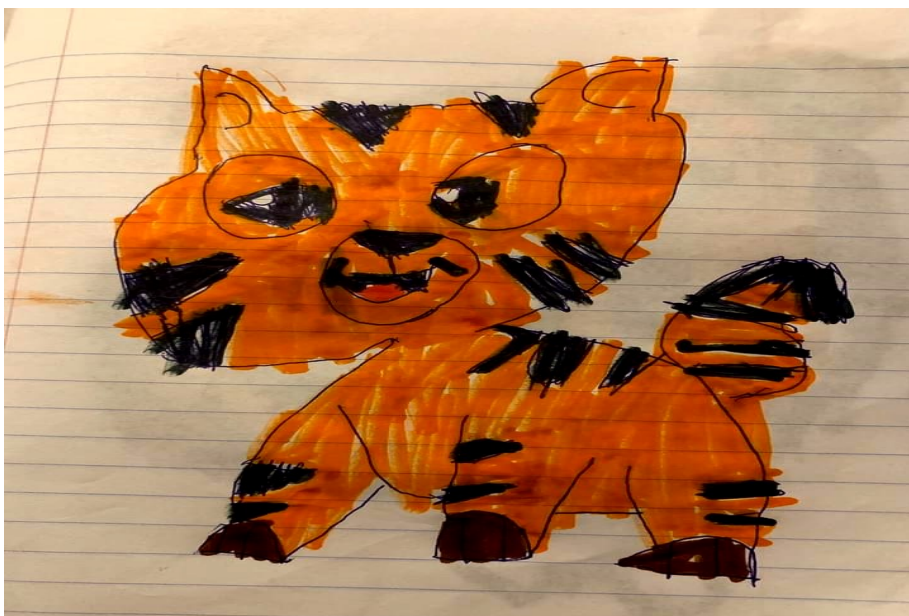
Last year, I and my family visited the Zoo in Garden City, Kansas. We saw a lot of animals there. For example, we saw elephants, giraffes, rhinos, tigers, birds, lions, and cheetahs. Out of all those, my favorite was the cheetah. Cheetahs are very good at running. They are also good at hunting. The other animal that we saw was giraffe. Giraffes look a little like dinosaurs, but they are spotted, and have long legs, and a short tail. My dad took a lot of pictures. After we visited more animals, we went to a hotel. The hotel was big. We slept there for a night. In the morning, we had warm breakfast. Then it was time to go home. On the way home, we saw birds, trees, and shops. I also saw Dominos. I asked my dad if we could order a pizza. I selected cheese pizza. The trip was good.



Sushan Thapa  
Grade: 3, Missouri



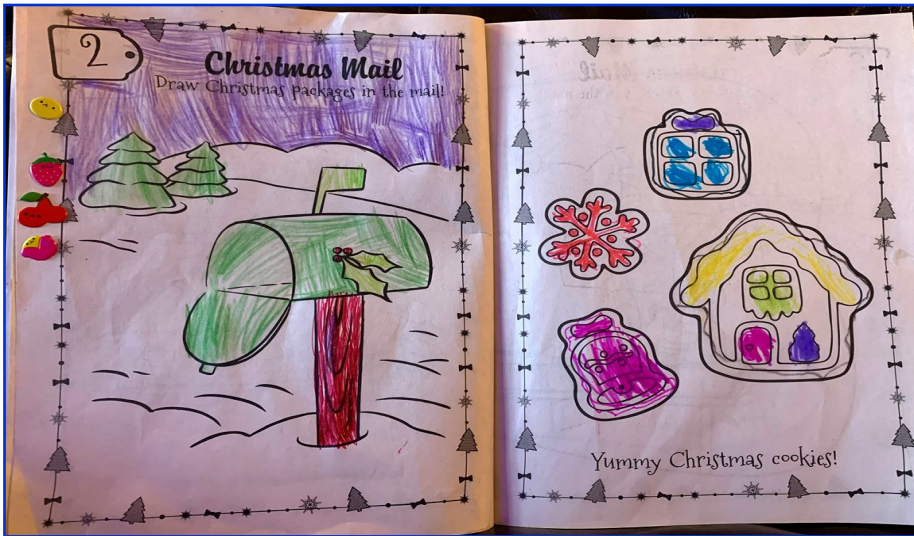
Sunay Adhikari  
Grade: 1, Idaho



Kristav Parajuli  
Grade: 1, Tennessee



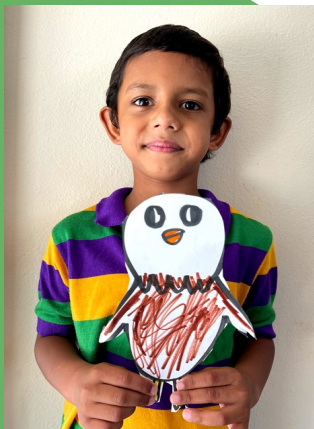
# KidsZone



Ivanna Jaiswal  
Pre-K, Indiana



Pratusha Pantha  
Kindergarten, Louisiana



Aarin Kandel  
Grade: 1, Louisiana





# Climate Change Adaptation Strategies for Growing Rice in Nepal

**Gehendra B. Gurung**  
 Email: [gehendra363@gmail.com](mailto:gehendra363@gmail.com)



## The post-monsoon rain of 2021: the shift in the monsoon time

In the evening of October 11, 2021, the Department of Hydrology and Meteorology (DHM) of the Government of Nepal (GoN) issued a special weather bulletin informing the withdrawal of the 2021 monsoon from the country from that day<sup>1</sup>. The department issued another special post-monsoon weather bulletin on 15<sup>th</sup> October for an upcoming rainfall event<sup>2</sup>. Following the second special weather bulletin, Nepal received intensive post-monsoon rainfall from 17<sup>th</sup> through October 22, 2021. Starting from the west of the country, the rainfall covered the entire country within a week. On October 18, 2021, at 10:30 am, the intensity of rainfall in the southern part of Dadeldhura district in the west, along the Churia hills, reached as high as 164 mm in 12 hours<sup>3</sup>. As the government has considered 60 mm of rain in one hour, 80 mm in three hours, 100 mm in six hours, 120 mm in 12 hours, and 140 mm in 24 hours as critical and dangerous<sup>4</sup>, the rainfall amount in Dadeldhura exceeded the critical or dangerous level<sup>5</sup>. In the afternoon of October 18, the rainfall spread through eastern Terai, exceeding the six hours critical level. The next day on October 19, 2021, the intensity of rainfall along the Churia hills and Terai between Mechi River in the east and Koshi River in the west reached as high as 238 mm in 12 hours which was excessively intensive<sup>6</sup>. All the major rivers from the Kankai in the east to the Mahakali in the west crossed their dangerous levels during the week that triggered the early warning.



Picture 1. Lodging of ready to harvest rice due to heavy rainfall. (Source: [onlinekhabar.com](http://onlinekhabar.com))

## Loss of life and damage of property due to post-monsoon floods and landslides

The flood and landslides due to this intensive rain of one week took 122 lives, with 28 missing and injuring 43 people. The death and missing of life and injury-affected 447 families. The economic value of personal properties damaged and destroyed by floods and landslides has been estimated at NRs. 15,516,620 (US\$ 130,000) as of October 23, 2021<sup>7</sup>. Several kilometers of roads, bridges and public properties were washed away and damaged by flood and landslides, the value of which is yet to be estimated and disclosed by the government.

## Impact of post-monsoon rain and flood on rice production

This article has primarily focused on the loss and damage of rice, and its adaptation needs to climate change. An estimated total area of 192,531 hectares of rice was damaged entirely or partially until October 29, 2021, as per the Ministry of Agriculture and Livestock Development (MoALD). This is more than 14% of the main (monsoon) season rice cultivated area in 2020. According to MoALD, the yield loss has been estimated as 424,113 mt, which is over eight percent of production based on 2020's main season rice production. In the monetary value, this is estimated at NRs. 11.88 billion (US\$ 99 million), which is around 0.3% of the country's GDP (33.98b in 2020)<sup>8</sup>. This is an extreme impact of a weather event on agriculture in just one week.

## The monsoon season has changed in Nepal

The question arises, "why was there such a huge crop loss?" "Why was not the government able to protect the loss and damage of rice from the effects of this rain?" The monsoon over Nepal has a backward shift as per the DHM. This is well-known. The DHM has redefined the new monsoon season. Earlier, the monsoon onset date was 10<sup>th</sup> June, and withdrawal was 23<sup>rd</sup> September with a total period of 106 days. But since the monsoon season has changed, the government has shifted the dates back to 13<sup>th</sup> June and 2<sup>nd</sup> October as onset and withdrawal dates, respectively, with a period of 112 days. So, the monsoon has changed by having a backward shift in terms of dates and an increase in terms of length by six days. On top of this information, observations have also shown in the past few years that post-monsoon rain has been damaging the rice at the

## Climate change adaption....



Picture 2. Recently harvested rice submerged in water. (Source: onlinekhabar.com)



Picture 3. Recently harvested rice sprouted in the field (Source: onlinekhabar.com)

harvesting stage. Also, the impacts happened despite there being two days early warning by DHM that the rain was coming. So, the answer could be as simple as that **“we have not yet realized the climate change, and we have not yet changed our behavior and activities to adapt to climate change.”** Inaction in adaptation to climate change means there will be unprecedented impacts in terms of loss and damage of lives and properties, including in agriculture.

### Adaptation of rice cultivation to climate change

In this backdrop, three measures or strategies may be worth adopting for rice adaptation to climate change. First, delay the rice season – planting and harvesting - by one week or so. This is to adjust the rice season with the backward shift of the monsoon season. Second, respond to the early warning issued by the DHM. Third, develop technologies for saving and protecting the rice when it is sucked in the water while the grains are in the plant.

#### Strategy I: Delay rice season by one week or so

The temperature regime through this new period should be assessed whether it meets the requirement of rice from planting through harvesting stage. This can be done by assessing the recorded temperature data and building a temperature scenario for the coming years for the monsoon season. The temperature requirement at grain filling and ripening stages will be critical to ensure that the increased temperature during the extended period of monsoon meets the requirement. The rainfall pattern should also be assessed so that the harvesting time will coincide with the least post-monsoon rainfall time or avoid the potentially high post-monsoon rainfall events. The other important study is to identify the optimum planting dates for different rice varieties at different altitudinal zones. The third is the adjustment of the new rice season with other social, cultural, and econom-

ic activities and vice-versa. Rice cultivation has linkages with various other activities in the communities and households. Such activities may include shifting livestock herds from one grazing zone to another, collecting, harvesting, processing, and using of natural resources, management of water for other crops, livestock and uses, and other economic, cultural, and social activities. The varietal test should also address the grain germination problem when wet in the plant.

#### Strategy II: Implement early warning systems for reducing yield loss

The second strategy is to respond to the early warning issued by DHM. This year the rain was forecasted, and the information was disseminated two days before the post-monsoon rain arrived. The weather information was also supplemented by a warning to those living along the potential flood zones to stay alert and be careful with agricultural activities. Unfortunately, this information did not get serious attention from the concerned stakeholders and the farmers. Some farmers were ready to harvest, some had harvested, and the crop was on the ground. They were not warned by the responsible authorities for protecting and saving the crops. In two days, farmers could adopt different options such as hold back crop harvesting, or collect and pile up the harvested crops the maximum they could and protect it from rain and water. Similarly, they could dig trenches through field bunds to let the rainwater drain out or provide physical support to the standing crops so that the plants will not fall when the rain or the wind hits. In addition, the early warning system (EWS) requires further development to enhance effectiveness. Two days EWS is very short for agricultural activities. Technologies should be developed and deployed to increase the warning lead time by at least one week.

An effective EWS should provide information of potential impacts on agriculture – what crops and livestock



## Climate change adaption....



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### #Special\_Alert

असोज ३१ रातीदेखि कार्तिक ३ सम्म महाकाली,सेती,भेरी नदी र सुदूरपश्चिम प्रदेशको मध्यपहाड,चुरे र तराई भई बहने स-साना नदीहरुमा बहाव उल्लेख्य बढ्ने र केहीमा सतर्कता तह आसपास पुग्न सक्ने; कर्णाली, नारायणी, कोशी, तिनाउ, कन्काई नदी तथा कर्णाली,लुम्बिनी,गण्डकी,बागमती प्रदेश,प्रदेश १ को मध्यपहाड, चुरे र तराई भई बहने स-साना नदीहरुमा बहाव बढ्ने र केहीमा आकस्मिक बहाव(Flash Flood) हुन सक्ने पूर्वानुमान रहेकाले उल्लेखित नदीहरुका तटीय क्षेत्रहरुमा उक्त अवधिभर विशेष सावधानी अपनाउनहुन अनुरोध छ।

Picture 4. Early warning notice (flood alert) released by the Government of Nepal.



Picture 5. Keeping rice plants upright together helps to reduce the impact of heavy rain/flood. This technique can be used for harvested rice as well, but may need to provide support using wooden sticks.

will be affected, what would be the extent of the effect or impact, and where will be the potential impacts. Such impact information will let the farmers understand the severity of the potential impacts of the forecasted weather event. This information should also be accompanied by advisories for protecting agriculture from being damaged and destroyed. The advisories should also be given for the best responses for taking actions to minimize the loss and damage even if the crops and livestock were affected, like saving the maximum of the wet grains when they were harvested but wet on the ground or in the standing plants. This advisory is similar to first-aid treatment in crops and livestock. This EWS is commonly called “**impact-based EWS with advisories.**”

### Strategy III: Develop quick response technologies and mechanisms

The third strategy is developing technologies to protect the grain when wet or drawn in water. The farmers were helpless as they did not get any advice regarding saving the grain from being more damaged when they were wet. Grains germinated in the plants, and farmers did not receive any advice or action to stop further germination.

Immediate action could be to drain out the accumulated water from the field. The second could be to bundle up the harvested plants lying on the ground and provide them with wooden sticks to keep the bundles upright. The third could also be to provide physical supports or sticks to the plants which fell over the ground and bring them to an upright position. But it seems there was no availability of such technologies or advice with which the line agencies were confident. So, there is a need for further research and studies in this area. Furthermore, to respond to such uncertain events, there is a need for good preparedness, such as stockpiling of wooden sticks, twigs, etc. that can be immediately used under such emergencies. The farmers also need training and skill development for responding to such uncertain events. Because of climate change, such uncertain events can frequently happen and with more severity.

The other needed technology is to capacitate the farmers to thresh out the grain immediately and simultaneously while cutting plants with minimum stalk. This might need portable mechanical technologies that fit in hill terrains as well. Such technologies will reduce the duration of exposure of grains to uncertain weather in the field as the grains fill from plant to bin.

### Conclusions

The onset time of the monsoon in Nepal has changed. Rice is highly sensitive, depends on the natural environment, and is adversely impacted by such change. However, the decisions and practices have yet to address the need for adaptation to such change. The longer we take to adapt to the monsoon shift, the greater impacts are certain. Adaptation should be delivered strategically using science-based knowledge and information. Also, building the capacity of farmers and service providers with technology, finance, and institutional supports is crucial for achieving effective adaptation of rice cultivation to change in monsoon.

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- <sup>1</sup>[https://twitter.com/DHM\\_FloodEWS/status/1447793001602826241](https://twitter.com/DHM_FloodEWS/status/1447793001602826241)
- <sup>2</sup>DHM, Special Weather Bulletin Post-Monsoon -1, 15Oct2021
- <sup>3</sup>[https://twitter.com/DHM\\_FloodEWS/status/1449966198670589959](https://twitter.com/DHM_FloodEWS/status/1449966198670589959)
- <sup>4</sup>[https://hydrology.gov.np/#/rainfall\\_watch?\\_k=mywjfz](https://hydrology.gov.np/#/rainfall_watch?_k=mywjfz)
- <sup>5</sup>[https://twitter.com/DHM\\_FloodEWS/status/1450349437650292742](https://twitter.com/DHM_FloodEWS/status/1450349437650292742)
- <sup>6</sup>[https://twitter.com/DHM\\_FloodEWS/status/1450422755699027976](https://twitter.com/DHM_FloodEWS/status/1450422755699027976)
- <sup>7</sup><http://www.drrportal.gov.np/>
- <sup>8</sup><https://www.imf.org/en/Countries/NPL#countrydata>



# Agroforestry for Resilient and Sustainable Agriculture

Sanjok Poudel\*, Prakriti Bista, Sita Thapa, Sushil Thapa

\*Correspondence: sanjokpoudel@gmail.com

## Background

It has been believed that the rapid increase in greenhouse gas (GHG) emissions due to human activities is a leading cause of global warming and climate change. Recently, as the concerns for the current and future impacts of climate change rise, natural climate solution strategies such as agroforestry are of great interest due to their potential in carbon sequestration and climate change mitigation. Natural climate solutions can mitigate up to 37% of GHG emissions that can help keep global temperature rise below 2 °C by 2030 (Griscom et al., 2017).

Agroforestry is a sustainable land management system that has the potential for addressing many land management and environmental problems. Its structural and functional diversity, with an emphasis on multipurpose trees and the production of several outputs, distinguishes agroforestry systems from monoculture farming (Nair and Graetz, 2004). The system results in overyielding where the productivity of the system is higher than individual monoculture systems (Clason and Sharrow, 2000). The agroforestry system can be broadly classified into three categories- agrosilvicultural, silvopastoral, and agrosilvopastoral systems. Agrosilviculture involves planting trees and crops under the same farm; silvopastoral system involves integrating trees, livestock, and forages under the common management unit; while agro-silvicultural involves planting trees, crops, and keeping animals under the same farm. Windbreaks, multifunctional riparian buffers, forest farming, alley cropping, and silvopasture are the five basic types of temperate agroforestry practices commonly adopted in the United States and other parts of the world. These agroforestry practices can help reduce the emission of GHGs and increase the resiliency of agricultural land to deal with climate variability. It also improves agricultural productivity, enhances air quality, provides wildlife habitat, and helps diversify farm productivity and increase overall farm income (Patel-Weynand et al., 2017).

## Benefits of agroforestry

Agroforestry is one of the resilient and sustainable agriculture practices that has tremendous potential to solve the long-term climate crisis. This system is ecologically sound, economically viable, and socially just and helps restore degraded land, protect biodiversity, and enhance food security for an ever-increasing global population. Further, agroforestry helps to enhance the agricultural

landscape, sequester atmospheric carbon to the soil, and reduce the overall GHG emissions. It is estimated that there is approximately 585–1,215 million ha of agroforestry land in Africa, Asia, and the Americas with a potential to sequester 1.1–2.2 Pg of carbon over 50 years (Dixon, 1995). It tends to have greater above- and below-ground C stock that contributes to the greater organic matter and soil organic carbon in the soil that improves the overall soil health (Lal, 2004; Sharrow and Ismail, 2004).

The integration of trees, crops, and livestock within the agroforestry system helps reduce environmental risk, protects against soil erosion, reduces damage due to flooding, and enhances water storage that enhances cropland and pastureland (Powlson et al., 2011). A study by Lee and Jose (2003) reported higher soil organic matter and microbial biomass in pecan and cotton-based alley cropping in the southern U.S. compared to monoculture cotton. Another study by Udawatta et al. (2008) reported enhanced soil aggregates stability, soil carbon, soil nitrogen, and soil enzyme activity in soils under agroforestry compared to row crops in the Midwest U.S. Trees within the system utilize deeper soil nutrients and provide additional nutrients to the soil through biomass decomposition (Clason and Sharrow, 2000; Garrett et al., 2000). In addition, agroforestry practices improve the resilience of farmers and increase farm productivity and household income because of multiple outputs from the system. A study by Thorlakson and Neufeldt (2012) in Western Kenya reported farmers adopting agroforestry practices resulted in a more accessible, safe, and stable source of fuelwood for energy and income, mainly benefiting women. Similarly, another study by Kalaba et al. (2010) reported a more stable maize yield under hedge-row agroforestry compared to monocropping.

Agroforestry also creates jobs and recreation opportunities along with promoting economic benefits to rural communities and the national economy. This system is critical to the livelihood of millions of people and helps produce local commodities such as fuelwood, timber, and fodder.

## Agroforestry in Nepal

Agroforestry is widely adopted throughout the tropical region of the world and to some level in the temperate region as well. In Nepal, the agroforestry system has been practiced since ancient times. However, it is practiced in a traditional and subsistence form with the lim-

## Agroforestry for Resilient...



Picture 1. An agroforestry landscape in Nepal. (Source: World Agroforestry Centre)

ited commercial aspect of agroforestry. There are tremendous prospects of agroforestry system in Nepal as the country has a large area of forestland, abandoned, barren land, and non-forested shrubland that are suitable for agroforestry practices. Nepal has about 40.36% of forest cover and 4.38% of other wooded lands, totaling 44.47% of the total forested land area (Department of Forest Research and Survey, 2015). Land degradation due to fragile geographical structure, deforestation, erosion, overgrazing, and poor agricultural practices are some of the major challenges in Nepal (Atreya et al., 2021). Few studies in the past have highlighted the socio-economic and environmental benefits of adopting an agroforestry system in Nepal (Acharya and Kafle, 2009; Biggs et al., 2013; Pandit and Paudel, 2013). Therefore, agroforestry practices could be a sustainable solution to restore the ecology of these degraded lands.

Although there is tremendous ecological, economic, and social scopes and opportunities, the adaptation to the agroforestry system in Nepal has been relatively slow (Neupane et al., 2002; Dhakal and Rai, 2020). Several challenges associated with adopting agroforestry practices in Nepal include the high initial cost of adoption, limited information on benefit-cost, and lack of knowledge and experts in the field. Farmers have limited knowledge and awareness of the benefits of adopting agroforestry. The complexity of the system requires scientific knowledge, improved technologies, and experts, which is limited in many parts of the country. The inadequate scientific database on the benefits of adopting agroforestry practices in Nepal raises questions and concerns among policymakers and politicians (Atreya et al., 2021). Governmental and non-governmental organizations such as Nepal Agricultural Research Council (NARC), Department of Forestry Research and Survey (DFRS), Department of Plant Resources (DPR), Asia Network for Sustainable Agriculture and Bioresources (ANSAB), Nepal Agroforestry Foundation (NAF), and Local Initiatives for Biodiversity, Research, and Devel-

opment (LIBIRD) have made various efforts to promote agroforestry practices in Nepal (Atreya et al., 2021). However, these efforts have been independent and there is a lack of a collaborative approach to reach every part of the country (Atreya et al., 2021). Therefore, Nepal needs to promote agroforestry practices by conducting collaborative research, extension, and demonstration among universities, research organizations, governmental institutions, NGOs/INGOs, and farming communities. Finally, favorable policies and regulations and agroforestry education at institutional and farmers' levels are needed to promote agroforestry nationwide.

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## Please Encourage Your Kids to Participate

Dear NAPA members and AC readers,

Please inform and encourage your kids to contribute for KidsZone. Creations such as arts, drawings, and any forms of writings (short essay, poem, story, memories, etc.) related to agriculture and allied sciences are accepted.

**KidsZone** also includes features on kids, animals, plants, life at school, and issues of particular interest to kids.

### Please include the following:

Name:  
School (optional):  
Grade:  
State/District:  
(And a photograph)

## **KIDS TODAY, SCIENTISTS TOMORROW!**

Agri-Connection Editorial Board invites and encourages you to send us your articles, intellectual ideas, opinions, thoughts, perspectives, memoirs, and literary creations.

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[ag.sushilhapa@gmail.com](mailto:ag.sushilhapa@gmail.com)



# लहरे तरकारी बालीमा थ्रि-जी कटिङ्ग प्रविधि

सुरुची त्रिपाठी  
कृषि प्रसार अधिकृत, कृषि ज्ञान केन्द्र, चितवन  
ईमेल: suruchitripathi06@gmail.com



## परिचय

लहरे तरकारी बाली भन्नाले काँक्रा, फर्सी, घिरौँला, लौका, करेला, चिचिन्डो, स्कुस आदि हुन् । नेपालको तराई क्षेत्रका कृषकहरूले यी बालीहरूको खेती गर्नका लागि पौष-माघ महिनाको अन्त्यबाट बीउ राख्न सुरु गरी माघ-फागून महिनाको मध्यबाट विरुवा सार्न सुरु गर्छन् । आधुनिक प्रविधिको प्रयोगले गर्दा चितवन लगायतका तराईका जिल्लाहरूमा भने लहरे बालीहरूको मौसमी र बेमौसमी गरी वर्ष भरि नै खेती गर्ने गरिएको छ । तराईका किसानहरूले दशैं, तिहार, छठ जस्ता मुख्य चाड पर्वहरूलाई लक्षित गरी काँक्रा लगायतका लहरे तरकारीहरू उत्पादन गर्छन् । पहाडी भेगका कृषकहरू प्लाष्टिक घरभित्र लहरे तरकारीको बेमौसमी खेती मार्फत फाइदा लिन सक्षम भएको पाइन्छ । लहरेबालीमा भाले र पोथी फूल फरक फरक हुने गर्छ । पोथी फूलमा सुरुमै चिचिला बसेको हुन्छ भने भाले फूलमा चिचिला हुँदैन । यी दुईखाले फूलहरू फुल्ने समय पनि फरक हुन्छ । यस्ता लहरे बालीहरूमा भाले फूल प्रशस्त फुल्ने र पोथी फूल कम फुल्नाले उत्पादनमा कमी हुने समस्या देखिन्छ । भाले फूलबाट निस्कने परागकणलाई मौरी जस्तो परागसेचकले पोथी फूलमा गएर परागसेचन

गरेपछि मात्र फल अडिने हुन्छ, अन्यथा कुहिएर झर्छ । धेरैजस्तो लहरे तरकारीमा परागसेचन नभएकै कारण फल नलाग्ने, सानैमा फलहरू कुहिने हुन्छ । यस्तो समस्यालाई समाधान गर्न मानिस आफैँले कृत्रिम परागसेचन गराइदिने अथवा परागसेचनमा सहयोग पुऱ्याउने मौरीको घर लगेर राख्नुपर्ने हुन्छ ।

पोथी फूललाई सजिलै चिन्नको लागि पोथी फूलको तल्लो भागमा चित्र १ मा देखाए जस्तै सानो फल हुन्छ र परागसेचन भएमा मात्र सो फल ठूलो हुन्छ नत्र कुहिएर झर्छ । भाले फूलको तल्लो भागमा कुनै पनि फल आकारको चिज हुँदैन । यसरी पोथी फूल धेरै फुलेमा र सबै फुलेका पोथी फूलहरू परागसेचित भएमा मात्र लहरे तरकारीको उत्पादन वृद्धि हुन्छ । धेरै किसानहरूले परागसेचन कृया राम्रो बनाउनका लागि मौरीको घरलाई लहरे खेती गर्ने स्थान वरपर राख्ने गरेको पाइन्छ । त्यसै गरी, पोथी फूलको संख्या बढाउन कृत्रिम हर्मनहरू जस्तै जि ए ३ को पनि प्रयोग गरिएको पाइन्छ । कृत्रिम हर्मन प्रयोग नगरी पोथी फूलको संख्या बढाउने प्रविधि मध्ये एक हो - थ्रि-जी (3-G) कटिङ्ग।



चित्र १: काँक्राको भाले फूल



चित्र २: काँक्राको पोथी फूल



## लहरे तरकारी बालीमा थि-जी.....

- जव विरुवा ६ देखि ८ फिट अग्लो हुन्छ तव त्यस विरुवाको मुख्य हाँगा/काण्डको टुप्पापट्टिको करिब २ ईन्च भागलाई चिमाटेर हटाउनु पर्दछ, जसलाई अङ्ग्रेजीमा पिन्चिङ्ग गर्नु भनिन्छ । यसो गर्नाले विरुवाले दोश्रो पुस्ताको हाँगाहरू दिन थाल्दछ ।
- जव मुख्य काण्ड फालेर पलाएको दोश्रो पुस्ते हाँगाहरू हुर्किएर १२ वटा पात भएको अवस्थामा पुग्छन् तव दोश्रो पुस्ते हाँगाको टुप्पापट्टिको भागलाई समेत चिमाटेर फाल्नुपर्छ । दोश्रो पुस्ते हाँगाबाट पलाउने तेश्रो पुस्ते हाँगाहरूमा धेरै भन्दा धेरै संख्यामा पोथी फूलहरू फुल्दछन् ।

### थि-जी कटिङ्गका फाईदाहरू

- थि-जी कटिङ्ग मार्फत लहरे तरकारीको उत्पादनमा लगभग ३ गुणाले वृद्धि हुन्छ ।
- थोरै जग्गाबाट पनि धेरै उत्पादन लिन सकिने हुँदा थोरै जमिनको उचित सदुपयोग गर्दै धेरै लाभ लिन सकिन्छ ।
- यस विधिबाट उत्पादित तरकारीको गुणस्तर तथा आकार राम्रो हुन्छ ।

### थि-जी कटिङ्गका बेफाईदाहरू

- पहिलो पुस्ते हाँगाहरू हटाएपश्चात् विरुवाले व्यापक रूपमा सहायक हाँगाहरू दिन थाल्छ र फूल फुल्ने, फल लाग्ने प्रकृया ढिला हुन्छ ।
- हाँगाहरू चुँडेको ठाउँबाट दुसी र व्याक्टेरिया जस्ता जीवाणुहरूको आक्रमण हुन सक्ने हुँदा होस पुऱ्याउनु पर्छ ।
- थि-जी कटिङ्ग गर्दा प्राविधिक ज्ञान र अनुभवको आवश्यकता पर्छ । जथाभावी तरिकाबाट गर्दा नोक्सान हुने सम्भावना हुन्छ ।

### थि जी कटिङ्ग लहरे तरकारीमा मात्रै गर्ने त ?

थि-जी कटिङ्ग लहरे तरकारीमा मात्र सिमित नभई अन्य तरकारी तथा फलफूलहरूमा पनि सफलतापूर्वक गरिएको पाइन्छ जस्तै: गोलभेडा, भेण्टा, भिन्डी, खुर्सानी, अंगुर आदि ।

### ध्यान दिनुपर्ने कुराहरू

- विरुवाको फेददेखि पाँचवटा पात आउने उचाइ सम्म कुनैपनि हाँगा आउन दिनु हुँदैन । यदि हाँगा आएमा त्यसलाई फाल्दिनुपर्छ ।
- यस विधिको अवलम्बन गर्दा माटोमा चिस्यानको मात्रा प्रशस्त हुनुपर्छ ।
- लहरे विरुवाले प्रशस्त मात्रामा घामको किरण पाएको हुनुपर्छ ।



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## Featured Agri-entrepreneur of the Quarter (Sep.– Dec. 2021)

### कृषक आवाज—किरण शाही

## कृषिमा नयाँ सोच: युवाको सहभागिता र सामूहिक प्रतिबद्धता



समग्र कृषि पेशालाई हेयका दृष्टिले हेरिने हाम्रो सामाजिक धारणालाई परिवर्तन गर्न खोज्नु चानचुने कुरा थिएन । तर यस्तो परम्परागत सोच र मान्यताका विपरित सल्यान जिल्लाको शारदा नगरपालिका वडा नं ५, रानीकोटमा दुई वर्ष अघि एउटा पृथक सोचको जन्म भयो । यो सोच थियो एउटा गाउँका सबैजना मिलेर सामूहिक रूपमा बाख्रापालन गर्ने । यस सोचका प्रवर्तक हुन् रानीकोटका किरण शाही जो गैर कृषि व्यवसायमा संलग्न युवा थिए । उनको यस नवीन सोचलाई वास्तविकतामा रूपान्तरण गर्न मद्दत गर्‍यो, राष्ट्रिय कृषि विकास कम्पनीले । राष्ट्रिय कृषि विकास कम्पनी, कृषि तथा वन विज्ञान विश्वविद्यालय, रामपुर, चितवनसँगको प्राविधिक साझेदारीमा संचालित विशिष्ट कृषि सेवा प्रदायक कम्पनी हो ।

कम्पनीको तीन भिन्न परियोजनामध्ये “बचेरा” कार्यक्रम खासगरी पशुपंक्षी पालन, मासुजन्य उत्पादन, उत्पादकत्व वृद्धि र बजारीकरणको कार्य गर्ने विशेष कार्यक्रम हो । यसै कार्यक्रमभित्र रहने गरी सल्यानमा Start With Available Resources (SWAR) मोडल तयार पारी काम सुरु गरिएको थियो । यो किसानले आफूसँग उपलब्ध श्रोत साधन जस्तै: पैसा, बाख्रा, युवाहरूको श्रमको लगानी र जग्गासमेत सेयरका रूपमा राखी कृषि व्यवसायमा जोडिने मोडल हो । यसै मोडेलमा आधारित भएर वडाका २० जना युवाहरू मिली राष्ट्रिय कृषि विकास कम्पनी खडा गरियो । कम्पनीले हरेक युवाहरूको बराबर सेयर लगानी हुने गरी प्रत्येक सेयरका धनीलाई सुरुमा एक लाख रुपैया बराबरको सेयर सिमा कायम गर्‍यो । तदनुसार आफूसँग उपलब्ध श्रोतसाधन जस्तै: खसी, बोका भए त्यसैलाई सेयरको रूपमा कम्पनीमा बुझाउन सक्ने र जग्गा भएकाले कम्पनीलाई घाँसखेतीका लागि जग्गा नै भाडामा उपलब्ध

गराउन सक्ने व्यवस्था मिलाईदियो । यस्तो सरल व्यवस्था भएपछि कम्पनी सुरु हुन केही समस्या हुने कुरै भएन । भएकाले नगदै बुझाएर अनि कसैले बाख्रा, पाठा त कसैले फर्म र गोठ निर्माण कार्यमा शारीरिक श्रम गरेर पनि आफ्नो सेयर कायम गराए । यसरी किसानहरूसँग पर्याप्त पूँजी नभए तापनि कम्पनीमा सेयर धनी हुनकालागि जोसंग जे छ त्यसैलाई पूँजीका रूपमा दिन मिल्ने गरी नीति नियम बनाएपश्चात रानीकोटको सफलताको कहानीले मूर्तरूप लिएको थियो ।



फोटो १. बाख्राको आधुनिक खोर निर्माण हुँदै ।



फोटो २. बाख्रापालनको लागि घाँसखेती ।

## कृषिमा नयाँ सोच....

सबैको समान अधिकार, सहभागिता र संलग्नताको सुनिश्चितता भएपश्चात वरपरको नीजि तथा सरकारी बाँझो जमिनमा घाँस रोपियो । तत्पश्चात, बाख्राको सुधारिएको खोर निर्माण गरियो र व्यावसायिक बाख्रा पालन कार्यक्रम सुरु गरियो । हाल जम्माजम्मी १४७ बाख्रा तथा बोकाहरू छन् । यी मध्ये ४ ओटा ब्याड छन् । करिब ९५ प्रतिशत बाख्रा बोयेर र बाँकी खरी जातका छन् । यसको निरन्तरता स्वरूप थप कार्यक्रमको रूपमा सोही मोडलमा आधारित हुँदै सामूहिक रूपमा भैंसीपालन पनि सुरु गरिएको छ । युवाहरूको यो लगनशीलता अनि समर्पण देखेपछि शारदा नगरपालिका तथा कर्णाली प्रदेश

सरकारले सहयोगको प्रतिबद्धता जाहेर गर्दै घाँसखेतीका लागि आर्थिक सहयोग समेत प्रदान गरे, जसबाट युवाहरू झनै उत्साहित भए । हाल प्रदेशका अन्य पालिकाहरू पनि यो मोडलमा बाख्रा पालन व्यवसाय गर्न धेरै उत्साहित भएका छन् । निर्वाहमूखी कृषि प्रणाली अवलम्बन गर्दै आएको नेपाली सामाजिक शैली भन्दा पृथक काम गरेकै कारण यस व्यवसायमा सबैको चासो बढी थियो । त्यसमाथि कामको खोजीमा लाखौं युवा विदेशिने संस्कृतिको विकास भएको हाम्रो समाजमा युवाहरू आफैले आफ्नै थातथलोमा केही नवीन कार्य गर्न सकिन्छ भन्ने उदाहरण यसले चरितार्थ गरेको छ ।



फोटो ३. सामूहिक बाख्रापालन ।

(प्रस्तुत कथालाई सङ्कलन गर्न नापाका डा. प्रेम भण्डारीले सहयोग गर्नुभएको हो । यस कार्यक्रम सम्बन्धी थप जानकारीको लागि सम्पर्क: [nadc.program@gmail.com](mailto:nadc.program@gmail.com))

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## कृषि कविता

### जुन उस्तै, घाम उस्तै

जुन उस्तै, घाम उस्तै  
शीतको थोपा उस्तै  
किसान दाइको मुहार देख्छु  
किन आज बेग्लै (१)

खेतैभरि काटेको धान  
नभित्रने भयो  
धानसँगै एउटा सपना  
भेलमा बगी गयो  
बाटो उस्तै, माटो उस्तै  
वनपाखा उस्तै (२)

पोहर सालको मकैमा  
दाना लागेन  
उखु बेच्या पैसा पनि  
हातमै परेन  
भोक उस्तै, तिर्खा उस्तै  
घरको छानो उस्तै (३)

आज पनि साहू आयो  
ब्याजकै कुरा गऱ्यो  
तिरिहाल नत्र भने.....  
कुन्नि के-के भन्यो  
दिन उस्तै, रात उस्तै  
शिरको टोपी उस्तै (४)

चुनाव आयो  
किसानको भोट नभै भएन  
चुनाव गयो  
कस्ले जित्यो, कता लाग्यो, थाहै भएन  
नेता उस्तै, भाषण उस्तै  
आश्वासन झन् उस्तै  
किसान दाइको मुहार देख्छु  
किन आज बेग्लै (५)



- सुशील थापा

Association of Nepalese Agricultural Professionals of Americas (NAPA)

Website: [www.napaamericas.org](http://www.napaamericas.org)

E-mail: [napa2072@gmail.com](mailto:napa2072@gmail.com)