Message from the President

Dr. Megha N. Parajulee, NAPA President

Dear NAPA members and global friends,

Welcome to the 22nd 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
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 3rd 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!!
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What is right is not always popular and what is popular is not always right - Albert Einstein
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/NepaleseAgriculturistAmericas

http://napaamericas.org

https://www.facebook.com/NapaleseAgriculturistAmericas
Please save the date!!

NAPA proudly announces

3rd 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:
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 3rd 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 Agriculture; 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

**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.

**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.

**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
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 3rd 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://gjaas.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.

**All full-time students are highly encouraged to participate in this contest.**
नापाको दिवापिक वैज्ञानिक अधिवेशन (से २७-२९, २०२२) मा संचालन गरिने कृषि-कविता गोष्ठीमा सहभागी हुन सम्पूर्ण साहित्य प्रेमी कवि-कवियत्रीहरूलाई हार्दिक अनुरोध गद्दीहरू । इष्ठुक सज्जाकृति सम्म आफ्नो मौलिक कृषि कविता “प्रतियोगिता” र “अप्रतियोगिता” श्रेणी निर्दिष्ट गरी यही मार्च ३१, २०२२ सम्ममा तलको ठेगानामा पठाउनु पर्ने अनुरोध छ।

प्रतियोगितका नियमहरू:
१. कविता कृषि तथा सम्बन्धित विषयसंग आधारित हुनुन्छ।
२. कविता शृङ्ग नेपाली भाषामा २०० शब्दमा लेखिएको हुनुन्छ।
३. प्रतियोगितको दिनमा आफ्नो लेखकको नामको दर्ता र कविता वाघा गर्नुपर्नेछ।
४. तीन सदस्यीय समितिले कविताको मूल्यांकन गर्नुहोस्।
५. उत्कृष्ट प्रथम, द्वितीय र तृतीय कवितालाई क्रममा: $२००, $१५० र $१०० पुरस्कार र योगायत निर्धारित गर्नुहोस्।
६. प्रतियोगितमा सहभागी कविताहरूको सर्वविधिकरण गर्नुहोस्।
७. कविताको साथमा लेखकको छोटो परिवर्त, फोटो तथा समावेश सामग्री गर्नुपर्नेछ।
८. प्रतियोगितमा सहभागी कविताहरूको "कृषिका सुसेलीहरु" संगालोमा प्रकाशन गर्न सकिनुहोस्।
९. कविता आगामी मार्च ३१, २०२२ मित्र लिन्ने ठेगानामा पठाउनु पर्नेछ।

कविता पठाउने ठेगाना:
agripoemnapa@gmail.com
dr. मनोज काकी
संयोजक, नापा कृषि कविता गोष्ठी २०२२
Association of Nepalese Agricultural Professionals of Americas (NAPA)

NAPA 2022
3rd BIENNIAL INTERNATIONAL
SCIENTIFIC CONFERENCE
MAY 27-29, 2022
ATLANTA, GA, USA

Appeal for Conference Sponsorship

The NAPA 3rd 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):

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

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. 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) to mail a check.

Please find the information about our past conferences:

**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.

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.

**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!
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 envisions utilizing the endowment revenue to sponsor NAPA’s flagship programs, prioritizing donor-specified activities 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 one’s. 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:

<table>
<thead>
<tr>
<th>Sponsor Level</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum Sponsor</td>
<td>≥$10,000</td>
</tr>
<tr>
<td>Diamond Sponsor</td>
<td>≥$7,000</td>
</tr>
<tr>
<td>Gold Sponsor</td>
<td>≥$5,000</td>
</tr>
<tr>
<td>Silver Sponsor</td>
<td>≥$3,000</td>
</tr>
<tr>
<td>Bronze Sponsor</td>
<td>≥$1,000</td>
</tr>
<tr>
<td>Green Sponsor</td>
<td>≥$500</td>
</tr>
<tr>
<td>Valued Sponsor or Supporter</td>
<td>&lt;$500 (allocated to common/pool fund)</td>
</tr>
</tbody>
</table>

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: agriconnection2072@gmail.com
cc: 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)

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

Email: agriconnection2072@gmail.com
ag.sushilthapa@gmail.com
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

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 3rd 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](https://www.napaamericas.org/donate.php)

- **Scholarship Fund:** [http://napaamericas.org/napa-scholarships-sponsors.php](http://napaamericas.org/napa-scholarships-sponsors.php)

The Webinar Committee (WC) hosted two important webinars during this quarter. The 26th 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.

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 27th 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.

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. Khusi 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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- **Vice President**
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  - Dr. Dilip Panthee
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# NAPA Membership Updates

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## Welcome New NAPA Members on Board!

### Student Member
- Mr. Abhishek Bajracharya, University of Mississippi
- Mr. Dinesh Poudel, North Dakota State University
- Ms. Kajol Pradhan, Tennessee State University
- Mr. Nabin Bhandari, Auburn University

### General/Regular Member
- Dr. Mahendra Bhandari, Texas
- Dr. Pratap Kafe, New York

### Life Member
- Dr. Keshav Timilsina Sharma, Minnesota

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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
NAPA has recently published a book entitled:


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
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

Please join or renew your membership. Become a life member if possible!
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
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. The department issued another special post-monsoon weather bulletin on 15th October for an upcoming rainfall event. Following the second special weather bulletin, Nepal received intensive post-monsoon rainfall from 17th 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. 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, the rainfall amount in Dadeldhura exceeded the critical or dangerous level. 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. 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.

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. 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). 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 10th June, and withdrawal was 23rd September with a total period of 106 days. But since the monsoon season has changed, the government has shifted the dates back to 13th June and 2nd 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

Picture 1. Lodging of ready to harvest rice due to heavy rainfall. (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 economic 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
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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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-
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 Development (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.

References


Agroforestry for Resilient....

ceedings of the National Academy of Sciences, 114(44), 11645-11650.


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.

Email: agriconnection2072@gmail.com
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लहरे तरकारी बालीमा थ्रि-जी कटिङ्ग प्रविधि

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परिचय
लहरे तरकारी बाली भन्नाले कॉक्रा, फूली, चिरिला, तोका, कोलाका, चिचिंडा, स्कुसुम आदि हुन्। नेपालको तराई क्षेत्रको कृषकहरूले यो बालीहरूको खेती गर्नका लागि पौष-माघ महिनाको अन्त्यबाट बीउ राख दुरु गरी माघ-फागू महिनाको मध्यबाट विस्तार लाग्न तरथन । आधुनिक प्रविधिको प्रयोग गर्ने गर्दा चितवन लगायतका तराईका जिल्लाहरूमा भने नहरे बालीहरूको मौसमी र बेमौसमी गरी अंदा थरी नै खेती गर्न गरीएको छ । तराईका किसानहरूले दशैँ, तिताहरू, छठ जस्ता मुख्य चाँद पर्वहरूलाई लक्षित गरी कॉक्रा लगायतका लहरे तरकारीहरू उत्पादन गर्नु। पहाडी भेगका कृष्णहरू प्लाटिक धारित्रिक घरकाट्न लहरे तरकारिको वेमौसमी खेती मार्फत फाइदा लिन सक्षम भएको पाइन्छ लहरेबालीमा भाले र पोथी फूल फरक फरक हुने गर्दा। पोथी फूलमा सुरुमै चिरिला बसेको हुन्छ भने भाले पोथी फूलमा चिरिला हुदैन। यी द्रुवाविद फूलहरू पुरानो समय पति फरक फरक हुन्छ । यस्ता लहरे बालीहरूमा भाले पूल प्रस्तावेर फुलने र पोथी फूल कम पुल नलाई उत्पादन गर्नु हुन्छ । धेरै किसानहरूले तराईका उत्पादन वृद्धि कराएका पाइन्छ । पोथी फूललाई सज्जलाई चिरिला बसेको मौसमी फूल हुन्छ र परागसेचन भएको पाइन्छ। पोथी फूललाई सज्जलाई चिरिला फूलमा प्रविधि गरेका पोथी फूलको संख्या बढाउको लागि कृत्रिम प्रविधि मध्ये कार्र। भाले फूलको परागकर्ता भने फूलको तालुका भाले फूलको तल्लो परागसेचन भएको पाइन्छ । धेरै किसानहरूले पोथी फूलको परागसेचन कृषि प्रसार अधिकृत, कृषि जान केन्द्र, चितवन ईमेलः suruchitripathi06@gmail.com

चित्र १: कॉक्रा को भाले फूल

चित्र २: कॉक्रा को पोथी फूल
गि-जी कटिङ्ग अन्योऽ भन्नाले तेश्रो पुस्ताको हााँगाको वृद्धद्ध षिकासलाई बढाउाँदै पटहलो र दोश्रो पुस्ताको हााँगाहरूको वृद्ध षिकासलाई कम गनु हो । पहिलो र दोश्रो पुस्ताको हाँगाहरूमा बढी संख्यामा भाले फूलहरू र थोरै संख्यामा पोथी फूलहरू पुल्चुन्न जसका कारण फूलहरू धेरै संख्यामा पनि फल नलाग्ने हुन्छ । यसै प्रशस्तै फूल फुल्सकेपतछ, पोथी फूलको अनुपात १४:१ रहेकोमा गि-जी कटिङ्ग गररसकेपतछ।

एक अध्ययनले गि-जी कटिङ्ग गनु पूर्व भाले पोथी फूलको अनुपात १४:१ रहेकोमा गि-जी कटिङ्ग गररसकेपतछ। यसै कारणबाट उत्पादनमा व्यापकता आउनौं र आम्दान तिन सकिन्छ।

**गि-जी कटिङ्ग गर्न तरिका**

- सर्वप्रथम लहरे तरकारीको बोटलाई ६ देखि ८ फिट उचाइ सम्म बढन दिनुपछ । अविभाजित बोटला पात पलाउने उचाइ सम्म बढ्नु पनि हाँगा आउन दिनु हुन्छ। यथा हाँगा आएमा फलिनुपछ । 
- भन्दा माथ्र पलाएको हााँगा बढन दिन सकिन्छ।

चित्र ३: लहरे बालीमा गि-जी (3G) कटिङ्ग गर्न तरिका (स्रोत: agdroid फेसबुक)
लहरे तरकारी बालिमा थ्र-जी.....

• जव विश्वा ६ देखि ८ फिट अगलो हुन्छ तव
tयस विश्वाको मुख्य होङ्गा/काण्डको टुप्पापटिको
करिब २ ईंच आगलाई चिमाटेर हटाउनु पर्दछ,
जसलाई अर्धहजीमा पिनिंथिङ गर्नु भन्निछ । यसो
गर्नैले विस्वाले दोश्रो पुस्तको होङहारु दिन राख्दछ ।
• जव मुख्य काण्ड फालेर पलाएको दोश्रो पुस्ते होङहारु
हुँकिएर १२ वटा पात भएको अवस्थामा पुगछन् तव
दोश्रो पुस्ते होङहारुको टुप्पापटिको आगलाई समेट
चिमाटेर फालनुपछ। दोश्रो पुस्ते होङहारु पलाउने तेश्रो
पुस्ते होङहारुमा धेरै भन्दा धेरै संख्यामा पोथी फूलहरु
फुल्दछन् ।

थ्र-जी कटिङ्र्कगका फाईदाहार

• थ्र-जी कटिङ्र्क माफेत लहरे तरकारीको उत्पादनमा
लगभग ३ गुणाले बुझ्द हुन्छ ।
• थोरै जग्राबाट पतन धेरै उत्पादन लिं सकिनेँ हुँना
थोरै जमिनको उचित सदुपयोग गर्दै धेरै लाम लिन
सकिनछ ।
• यस विरुवाट उत्पादित तरकारीको गुणस्तर तथा
आकार रामी हुन्छ ।

थ्र-जी कटिङ्र्कगका बेफाईधार

• पहिलो पुस्ते होङहारु हटाएका विश्वाले व्यापक
रुपमा सहायक होङहारु दिन थाल्छ र फूल फुल्ने, फल
लाग्ने प्रकृयाहरू हुन्छ ।
• होङहारु छुट्टोको ठाउँबाट दुसै र व्यापकतिया जस्ता
जीवाणुरुहरूको आक्रमण हुन सक्दै हुँदा होस पुयाउनु
पछ।
• थ्र-जी कटिङ्र्क गर्दा प्राविधिक ज्ञान र अनुभवको
आवश्यकता पछ। ज्ञानधारी तरिकाबाट गर्दा नोक्सन
हुने सम्भावना हुन्छ ।

श्री जी कटिङ्र्क लहरे तरकारीमा मात्र गर्न त?

श्री-जी कटिङ्र्क लहरे तरकारीमा मात्र सिमिट नभई अन्य
tरकारी तथा फलपुलहस्ता पनि सफलतापूर्वक गरिएको
पाइन जस्तै: गोलभेडा, भेण्डा, भिन्डी, खुर्साँ, अंगुर
आदि ।

ध्यान दिनुपर्न एकाहार

• विश्वाको फेददेखि पाँचवटा पात आउँने उचाई
सम्म कुनैपतन होङ्गा आउन दिनु हुँदैन । यदि
होङ्गा आएमा त्यसलाई फालिनुपछ।
• यस विरुवाट अवलोकन गर्दा माटोमा विस्थानको मात्रा
प्रशस्त हुनुपछ।
• लहरे विस्वाले प्रशस्त मात्रामा घामको किरण पाएको
हुनुपछ।

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http://napaamericas.org/agri-connection.php
समग्र कृषि पेशालाई हेयका दृष्टिले हेरिने हाम्रो सामाजजक धारणालाई परिवर्तन गर्न खोज्नु पाइनुहुने कुरा थिएम। तर यस्तो परस्परागत सोच र मान्यताको विपरित सत्यनाथ जिल्लाको शारदा नगरपालिका ब्दा नं. ५, रानीकोटमा दुई वर्ष अघि एउटा पृथक सोचोको जन्म भए। यो सोच थियो एउटा गाउँका सबैभूषा मिलेका सामूहिक रुपमा बाख्रापालन गर्न। यस सोचका प्रवर्तक हुन् रानीकोटका किरण शाही जो गैर कृषि व्यवसायात्मक संस्थान युवा थिए। उनको यस नवीन सोचलाई वास्तविकतामा रूपान्तरण गरेका मजदूर थिइयो, राष्ट्रिय कृषि विकास कम्पनीले। राष्ट्रिय कृषि विकास कम्पनी, कृषि तथा वन विज्ञान विद्यालय, रामपुर, वित्तविद्यालयको प्राधिक साझेदारीमा संचालित विश्वेत्त्त कृषि सेवा प्रदायक कम्पनी हो। कम्पनीको तीन भिन्न परियोजनामध्ये “बचेरा” कार्यक्रम खासगरी पशुपंक्षी पालन, मामुजक्थ उत्पादन, उत्पादकत्व वृद्धि र बजारीकरणको कार्य गर्न विशेष कार्यक्रम हो। यसै कार्यमग्निको रहने गरी सत्यनाथमा Start With Available Resources (SWAR) मोडल तयार पारी कम सुरु गरिएको थियो। यो किसानले आफूसंग उपलब्ध श्रोत साधन जस्तै: पैसा, बाख्रा, युवाहरूको श्रमको लगानी र जग्गासमेत सेयरका रूपमा राखी कृषि व्यवसायमा जोडिने मोडल हो। यसै मोडलमा आर्थिक सहयोग वडाका २० जना युवाहरू मिली राष्ट्रिय कृषि विकास कम्पनीको खाली गरिएको थियो। कम्पनीले हरेक युवाहरुको बराबर सेयर लगाने हुने गरी ध्यान र जस्तै युवाहरुको धर्मी दिखाइ सुरुका एक लाख रुपैयाँ बाबारो सेयर सिमा कायम गरिएको थियो। तदुत्तम अभियान आफूसंग उपलब्ध श्रोत साधन जस्तै: खसी, बोका भए त्यसैलाई सेयरको रूपमा कृष्यात्मक बुझाउन सक्ने र जगगा भएकाे कम्पनीलाई घाँसकेतिका लागि जगी ने भागमा उपलब्ध गराउन सक्ने व्यवस्था मिलाइदिएको छ। यसैलाई धेरै सरल व्यवस्था सुरु गर्न सक्ने कृषि परम्पराको पहिलो सामन झुकेर भएको छ। भएकाे लगाऊँसै अभियान कसैले आफूसंग उपलब्ध थिए नेपाल र गठ निर्माण कार्यमा शपीलिक भूमिका गरेका पनि अपनो सेयर कायम गराउँ। यसैलाई किसानहरूको पर्याप्त पृथक नेपाल रे तपाईलाई सेयर धनी हुनुको माध्यममा जोसै छ ज्यामै भएकाे पृथक रूपमा दिन मिल्ने गरी नीति नियम बनाउनुभए रानीकोटको सफलताको कहाँले मूढौं लिएको थियो।

फोटो १. बाख्राको आधुनिक खोर निर्माण हुन्दे।

फोटो २. बाख्रापालनको नागिघासिको दिन।
कृषिमा नयाँ सोच....

सबैको समान अधिकार, सहभागिता र संलग्नताको सुनिश्चितता भएप्रायत वरपरको नीजि तथा सरकारी बॉँझो जमिनमा घास रोपियो । तत्पश्चात, बाख्राको सुधारिएको खोर निर्माण गरियो र व्यवसायिक बाख्रा पालन कार्यक्रम सुरु गरियो । हाल जम्माजम्मी १४७ बाख्रा तथा बोकाहु छन् । यी मध्ये ४ ओटा य्वाद छन् । करिब ९५ प्रतिशत बाख्रा बोकेपछि बॉली अखारी छन् । यसको निरन्तरता स्वरुप थप कार्यक्रमको रूपमा सोही मोडलमा आधारित हुन्दै सामूहिक रूपमा भैंसपालन पनि सुरु गरिएको छ । युवाहरूको यो लगाशीलता अनि समर्पण देखिएको शारदा नगरपालिका तथा कर्णाली प्रदेश सरकारले सहयोगको प्रतिबद्धता जाहेर गर्दै घासखेतीका लागि आधिक सहयोग समेक प्रदान गरे, जसबाट युवाहरू झन्ने उत्साहित भए । हाल प्रदेशका अन्य पालिकाहरू पनि यो मोडलमा बाख्रा पालन व्यवसाय गर्न धेरै उत्साहित भएका छन् । निर्वाहमूली कृषि प्रणाली अवलम्बन गर्दै आएको सिराजी सामाजिक शैली भन्दा पृथक काम गरेके कारण यस व्यवसायमा सबैको चासो बढी थियो । त्यसमाथ्रको कामको खोजीमा लाखौं युवा विदेशिले विदेशिले संस्कृतिको विकास भएको हाम्रो समाजमा युवाहु आफ्नो आफ्नो थानसुन युवाहु आफ्नो जीवन कार्य गर्दै सकिन्छ भन्ने उदाहरण यसले चरितर्य गरेको छ ।

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

FOOTO ३. सामूहिक बाख्रापालन

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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)

खेतभरि काटेको धान
निस्तिने भयो
धानसँगै एउटा सपना
भेलमा बगी गयो
बाटो उस्तै, माटो उस्तै
बनपाखा उस्तै (२)

पोहर सातको मकैमा
दाता लागेन
उखु बेच्या पैसा पल्ने
हातमै परेन
भोक उस्तै, तिखाउ उस्तै
घरको छानो उस्तै (३)

आज पनि साहू आयो
ब्याजकै कुरा गन्यो
तिरिहाल नत्र भने....
कुल्न के-के भन्नो
दिन उस्तै, रात उस्तै
शिरको टोपी उस्तै (४)

चुनाव आयो
किसानको भोट नभि भएन
चुनाव गर्ने
कस्तै जित्ने, कता लाग्ने, थाहै भएन
नेता उस्तै, भाषण उस्तै
आश्वासन झन उस्तै
किसान दाइको मुहार देख्छु
किन आज बेग्लै (५)

- सुशील थापा