AGRI-CONNECTION

March 2024 | Volume 9, Issue 1

PROSPERITY THROUGH AGRICULTURAL TRANSFORMATION

NAPA Conference

NAPA Election

Nepal News

Phytoacoustics

Social Mobilization

कृषि कविता
Dear NAPA members and everyone,

As I write my final presidential message for the Agri-Connection (AC) newsletter, I reflect on my involvement with NAPA since its establishment in 2015. I was proud to be part of the founding working committee that chartered the organization, and I've remained actively engaged ever since. Over the past four Executive Committees, I've had the honor of serving as Joint Secretary (2016-2018), General Secretary (2018-2020), Vice President (2020-2022), and President (2022-2024). Through the unwavering support of our esteemed NAPA members and the tireless efforts of dedicated committees, we have diligently pursued the advancement of NAPA's prominence, focusing on several key areas.

To create a valuable resource for our members, we launched a database of NAPA-affiliated agricultural professionals and their expertise. However, to truly maximize its potential, we need our members’ help to expand it. We launched a hugely successful first phase of our Subject-matter Roundtable, fostering meaningful interaction and networking between students, scientists, and professionals of all career stages. To keep this momentum going, we need to continue this program. We recently launched the New Faculty Spotlight program and regularly organized various trainings, workshops, and symposia for networking, capacity building, and professional development of our members. Bimonthly webinars and panel discussions addressed contemporary agricultural and environmental issues. We are expanding collaborations with other organizations in the Americas, Nepal, and beyond to achieve our common goals. Our dedicated editorial board is making significant progress on the GJAAS publication. We tried to strengthen NAPA’s resources by seeking extramural funding and endowment funds. NAPA is a sub-awardee ($15,000) for a United States Department of Agriculture (USDA) funded project on “Generating and Sustaining the Next Generation of the Food, Agriculture, Natural Resources, and Human Sciences Workforce through International Experiential Learning, Outreach, and Engagement”, led by Kentucky State University. We have received a total pledge of ~$110,000 for the endowment fund as of now. We need tremendous support from our members and beyond to make a real difference.

We are excited to release the concluding edition (Volume 9, Issue 1) of AC from the 2022-2024 Executive Committee. This issue features insightful agricultural articles and research summaries, and as always showcases the amazing work of our committees and members. A huge thank you to our members and supporters! Your invaluable contributions are the very foundation of our newsletter and the key to our achievements.

Our sub-committees have been busy organizing events over the past quarter. The Student Coordination Committee (SCC) hosted a New Faculty Spotlight event on January 14, 2024 for networking and professional development, featuring four exciting new faculty members. The Webinar Committee (WC) organized the 38th Webinar on “Ecosociocentrism: The Earth First Paradigm – A Journey from Anthropocene to Symbiocene” on February 18, 2024. The 39th webinar on “Building Resilient Communities: Addressing Seismic Vulnerability and Youth Outmigration in Nepal” has been scheduled for April 7, 2024. The Research and Capacity Building Committee (RCBC) is compiling final reports and planning for presentations from Research Mini-Grant awardees at the upcoming conference. The RCBC hosted “Writing Interdisciplinary Research Proposals: Practical Insights” led by a renowned Professor Dr. Xiangming Xiao from the University of Oklahoma on March 10, 2024. Behind the scenes, dedicated members of each sub-committee are making incredible contributions in their areas of focus.

Message from the President

Dr. Pradeep Wagle
NAPA President
Please plan to attend the NAPA 4th Biennial International Scientific Conference, which will occur in a hybrid format, both virtually and in person, from May 24-26, 2024 in Baltimore (Maritime Conference Center), Maryland, USA. With 217 abstracts submitted for oral and poster presentations from nine countries, the conference promises a diverse range of scientific perspectives. In addition, several keynote and invited speakers will be sharing their expertise. The registration portal and hotel reservation are open at https://napaamericas.org/NAPA-conference-2024. The Conference Organizing Committee (COC) and sub-committees are working tirelessly to ensure a successful conference. A big thank you to the Nepali business community in Maryland! Their generous donations are fueling the NAPA Conference. We are incredibly grateful for their support in this important event.

NAPA is growing strong! We have welcomed 26 new members this quarter alone, and we are thrilled to have them! This expanding community creates a vibrant platform for collaboration. I would like to thank everyone for their continued solidarity and support to make NAPA grow internationally.

A huge thank you to the AC Editorial Board, led by Dr. Sushil Thapa! Their dedication to excellence ensures that every issue of Agri-Connection is top-notch. Please submit your contributions to newsletter@napaamericas.org and help us keep Agri-Connection as a valuable resource for the community!

**Wishing everyone a very Happy New Year 2081 BS!**

Message ...

Association of Nepalese Agricultural Professionals of Americas (NAPA)

Executive Committee

President
Dr. Pradeep Wagle

Vice President
Dr. Ramjee P. Ghimire

General Secretary
Dr. Nityananda Khanal

Joint Secretary
Dr. Sushil Thapa

Treasurer
Dr. Bishwo Adhikari

Members
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Dr. Kripa Dhakal
Dr. Pramod Pokhrel
Dr. Uma Karki

Dr. Megha N. Parajulee, Immediate Past President

https://www.napaamericas.org/
We are thrilled to announce the release of Volume 9 of Agri-Connection. The soaring height of Agri-Connection epitomizes the boundless altruism and unwavering dedication of all contributors, who have generously contributed their creativity, time, energy, and efforts into this endeavor. As a result, beyond being merely a newsletter, Agri-Connection stands as a symbol of our community’s commitment, collaboration, and capability. Thank you, everyone!

Currently, NAPA team is deeply immersed in the meticulous planning and execution of the 4th Biennial International Scientific Conference, slated to take place from May 24-26, 2024, in the vibrant city of Baltimore, Maryland with a theme of Climate-Smart and Innovative Agriculture. This conference aims to bring together experts, policymakers, researchers, growers, and students to share knowledge, best practices, and innovative solutions for fostering climate-resilient agriculture. Kindly mark your calendar and join us in this remarkable undertaking. Your presence is eagerly anticipated, and we would be delighted to have you contribute to the success of this momentous occasion.

This edition of Agri-Connection highlights the conference activities and presents an overview of keynote/invited speakers. Articles covering diverse topics such as direct seeded rice, phytoacoustics in plant life, social mobilization, and biological pest control are featured. Additionally, we provide a comprehensive overview of NAPA’s impactful initiatives and achievements in organizational development, capacity building, networking, and philanthropy.

Happy Nepali New Year 2081 BS to you all!

AGRI-CONNECTION
Editorial Board

Dr. Sanjok Poudel
Editor

Dr. Sushil Thapa
Editor-in-chief

Dr. Rajan Shrestha
Guest Editor

Mr. Tribikram Dahal
Nepal Correspondence

Mr. Bidur Paneru
Guest Editor
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message from the President</td>
<td>2</td>
</tr>
<tr>
<td>Editorial</td>
<td>4</td>
</tr>
<tr>
<td>Save the Date for NAPA Conference - 2024</td>
<td>6</td>
</tr>
<tr>
<td>Conference Organizing Committee</td>
<td>7</td>
</tr>
<tr>
<td>Conference Highlights</td>
<td>8</td>
</tr>
<tr>
<td>Hotel and Registration Information</td>
<td>9</td>
</tr>
<tr>
<td>Keynote Speaker</td>
<td>10</td>
</tr>
<tr>
<td>Invited Speakers</td>
<td>11</td>
</tr>
<tr>
<td>Conference Sponsors</td>
<td>12</td>
</tr>
<tr>
<td>Conference Activities</td>
<td>13</td>
</tr>
<tr>
<td>NAPA Election - 2024</td>
<td>14</td>
</tr>
<tr>
<td>Webinar Series - 38 and 39</td>
<td>16</td>
</tr>
<tr>
<td>Training/Seminar</td>
<td>17</td>
</tr>
<tr>
<td>Call for Articles</td>
<td>18</td>
</tr>
<tr>
<td>Nepal News</td>
<td>19</td>
</tr>
<tr>
<td>Photograph in Action</td>
<td>21</td>
</tr>
<tr>
<td>Appeal for Contribution to Endowment Fund</td>
<td>22</td>
</tr>
<tr>
<td>Membership Update</td>
<td>23</td>
</tr>
<tr>
<td>Appeal to Join/Renew Membership</td>
<td>24</td>
</tr>
<tr>
<td>Membership Type and Fee</td>
<td>25</td>
</tr>
<tr>
<td>NAPA Committees</td>
<td>26</td>
</tr>
<tr>
<td>KidsZone</td>
<td>27</td>
</tr>
<tr>
<td>Article: Transforming Rice Farming through Direct Seeded</td>
<td>28</td>
</tr>
<tr>
<td>Article: Phytoacoustics and its Vital Role in Plant Life</td>
<td>31</td>
</tr>
<tr>
<td>Article: Ladybird Beetle: A Promising Biological Control</td>
<td>33</td>
</tr>
<tr>
<td>Article: Social Mobilization: A Valuable Approach</td>
<td>35</td>
</tr>
<tr>
<td>कृषि कविता: कृषक र कर्मको फल</td>
<td>39</td>
</tr>
</tbody>
</table>

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Publisher
Association of Nepalese Agricultural Professionals of Americas (NAPA)
Email : napa@napamericas.org
Website: https://napamericas.org/
Please SAVE THE DATE

NAPA Proudly Announces

4th Biennial International Scientific Conference

MAY 24-26, 2024
Memorial Day Weekend
www.napaamericas.org

Conference Theme: Climate-Smart and Innovative Agriculture

Maritime Conference Center
692 Maritime Blvd, Linthicum Heights, MD 21090

Stay Tuned For More Updates
Agri-Connection, Volume 9, Issue 1 - March 2024
Conference Highlights

- Panel Discussions on Various Topics
- Student Writing Contest
- Student Rapid Fire Presentations
- Student Oral and Poster Competition
- Professional Development Workshops
- Professional Oral and Poster Presentations
- Distinguished Achievement Award in Agriculture
- Outstanding Students Recognition
- Special Session on Gender Role in Climate-Smart Agriculture and Global Food Security
- Research Mini-Grantees Presentations
- Agri-Poem Recitation
- Fun Filled Cultural Night
- Door Prizes

Conference Theme: Climate-Smart and Innovative Agriculture

NAPA 2024
4th BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE (HYBRID)
MAY 24-26, 2024 | BALTIMORE, MARYLAND, USA

Association of Nepalese Agricultural Professionals of Americas (NAPA)
NAPA 2024
4th BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE (HYBRID)
MAY 24-26, 2024 | BALTIMORE, MARYLAND, USA

Association of Nepalese Agricultural Professionals of Americas (NAPA)

Conference Theme: Climate-Smart and Innovative Agriculture

MARITIME CONFERENCE CENTER

692 Maritime Blvd, Linthicum Heights, MD 21090

RATE PER ROOM PER NIGHT:
- Single Occupancy: $165.00
- Double Occupancy: $210.00
Additional persons in the room are charged $45 each/night; Maximum of 4 people

ROOM RATES INCLUDE:
- Breakfast and Dinner
- Complimentary Wi-Fi, parking, and shuttle service to/from BWI Airport/Amtrak Station

HOTEL RESERVATION:
- Call Hotel Reservations at (866) 900-3517 and identify yourself with NAPA Conference 2024
- Book reservations online on the website: https://gettaroomb4checkin.com/mccbwil/#main
  (Use group code: 6625)

- Group discounted rates available for reservation from 5/22 to 5/28/24
- Book before Friday, May 03, 2024 to get group discounted rates

Free cancellations 72 hours before check-in

Conference Theme: Climate-Smart and Innovative Agriculture
TOPIC
Addressing Global Food and Nutritional Security Challenges and Opportunities: An 1890 Land-Grant Universities Perspective

Key Note SPEAKER

DR. MOSES T. KAIRO
Dean: School of Agricultural and Natural Sciences
Director: Land Grant Programs and 1890 Universities Center of Excellence for Global Food Security and Defense
University of Maryland Eastern Shore

Maritime Conference Center
692 Maritime Blvd, Linthicum Heights, MD 21090

www.napaamericas.org

Invited SPEAKER

DR. HARRY BHANDARI
Delegate
Health and Government Operations Committee
The Maryland House of Delegates
(Lower house of the legislature of the U.S. state of Maryland)
Chair of Maryland Legislative Asian-American Pacific Islanders (AAPI) Caucus

Maritime Conference Center
692 Maritime Blvd, Linthicum Heights, MD 21090

www.napaamericas.org

Invited SPEAKER

MR. HANS SCHMIDT
Assistant Secretary
Resource Conservation
Maryland Department of Agriculture

Maritime Conference Center
692 Maritime Blvd, Linthicum Heights, MD 21090

www.napaamericas.org

Conference Theme: Climate-Smart and Innovative Agriculture
Association of Nepalese Agricultural Professionals of Americas (NAPA)

NAPA 2024
4th BIENNIAL INTERNATIONAL SCIENTIFIC CONFERENCE (HYBRID)
MAY 24-26, 2024 | BALTIMORE, MARYLAND, USA

INVASED SPEAKERS

DR. PUNEET SRIVASTAVA
Topic: Climate Forecasts and Projections for Climate-Smart Agriculture and Water Resources Management

DR. STEPHAN J. GOETZ
Topic: The 2022 Census of Agriculture: Updates and Emerging Trends for the Northeast U.S.

DR. RICHARD C. RHODES III (RICK)
Topic: Can Agriculture Save the World?

DR. SRINIVASA RAO MENTREDDY
Topic: Low-temperature Atmospheric Pressure Plasma: A Green Technology for Improving Crop Productivity, Food Safety and Agricultural Sustainability

DR. CHRIS B. WATKINS
Topic: Postharvest technologies to reduce losses of fruits and vegetables – understanding the differences between hype and reality!

DR. TERESA E. LESLIE
Topic: What Funding Opportunities are Available to Farmers and Ag Businesses?

MR. PAUL GOERING

MS. MARGARET (MEGAN) TODD

Common Topic: Awareness and understanding of the laws in agricultural production, processing, and marketing

Conference Theme: Climate-Smart and Innovative Agriculture
Thanks to Our Gold Sponsors

LI-COR
Impacting Lives Since 1971

LI-COR Corporate, Lincoln, NE with a generous donation of $500 for sponsoring student poster presentation awards

Dr. Chakra Budhathoki and family from Perry Hall, MD with a generous donation of $500

Dr. Kishor Bhattarai and his family from Davis, CA with a generous donation of $500

Mr. Prabin Bhandari Baltimore, MD with a generous donation of $500

Ghimire Homes Nottingham, MD with a generous donation of $500

Thanks to Our Silver Sponsors

- Mr. Basudev Sharma Pokhrel & Pokharel Pest Control from Ellicott City, MD
- Mr. Sudarshan Paudel from Nottingham, MD
- Mr. Ram Bhandari from Parkville, MD
- Mr. Kiran Pantha from Westminster, MD
- Mr. Krishna K.C from Baltimore, MD
- Mr. Prem Purja Pun Baltimore, MD
- Mrs. Shrijana Khanal from Baltimore, MD
- Mr. Ganesh Lamichhane from Baltimore, MD
- Mr. Narayan Kandel, Bishnu Ghimire, Bhanu Gautam, Pizzaman Restaurant & Bar, Columbia, MD

NAPA is grateful to all our sponsors for the generous donation to the NAPA Conference Fund. If you or your business would like to support the conference fund, please let us know. We appreciate any level of support.

Conference Fundraising Subcommittee, NAPA

Conference Theme: Climate-Smart and Innovative Agriculture
With 217 abstracts submitted from nine countries for oral and poster presentations, the conference ensures a diverse range of scientific viewpoints. This reflects its global reach and interdisciplinary nature, providing attendees with the chance to engage with cutting-edge research from around the world, fostering international collaboration.

Please stay tuned for further information!

Conference Organizing Committee
NAPA Election

Call for Nominations for Executive Committee
(Date of call: March 18, 2024)

NAPA Election Commission invites nominations from its members to serve on the Executive Committee (EC) for a two-year term beginning May 27, 2024. The nominations are called for the following positions:
- President (1)
- Vice President (1)
- General Secretary (1)
- Joint Secretary (1)
- Treasurer (1)
- Executive Members (6)

Interested NAPA members shall self-nominate, and one member can self-nominate for only one position mentioned above. To simplify the nomination process, no 3rd party nomination will be accepted. Nominations must be submitted to the Election Commission no later than April 22, 2024 (11:59 PM EDT) for consideration. Nominations must be submitted by following the guidelines and procedures as described below.

Nomination Guidelines and Procedures:

While submitting a self-nomination, the following guidelines and procedures must be observed:
- Must be a NAPA Life Member.
- In the case of the President, interested members must have served at least one term in the EC.
- One individual member is eligible to submit a nomination for only one position.
- The position being self-nominated must be specified.
- The nominee must provide the following information:
  a. Name:
  b. Current mailing address:
  c. Valid e-mail address:
  d. Valid phone number:
  e. Member in good standings as of April 22, 2024: Yes or No
  f. Current Officer: Yes or No
- Each nominee shall provide a statement describing why he or she is eligible for the position according to the nomination guidelines described above and the NAPA bylaws.
- Each nominee shall provide a statement of intent describing in no more than 500 words (maximum limit) why he or she uniquely qualifies to serve in the position and their vision for NAPA.
- Nomination must be submitted no later than April 22, 2024 (11:59 PM EDT).
- Nomination must be submitted online at https://www.napaamericas.org/Election-2024.

For other information about the nomination process and election, please visit the NAPA website at: https://www.napaamericas.org/Election-2024.

Respectfully,

Election Commission
Dr. Prakash Malla, Chief Commissioner
Ms. Gita Koirala, Commissioner
Dr. Ramesh Pokhrel, Commissioner
NAPA Election

Timetable for the 2024 NAPA Election

(Date of announcement: February 21, 2024)

The 2024 Election Commission of the Association of Nepalese Agricultural Professionals of Americas (NAPA) has finalized the following timetable for conducting the 2024 Executive Committee (EC) election according to the bylaws of the Association. This timetable will be strictly followed. If it does not specify a time, it should be understood as 11:59 PM Eastern Time on that date.

<table>
<thead>
<tr>
<th>Date</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 February 21, 2024</td>
<td>The first Notice sent regarding the Election for the Executive Committee – highlights voters’ eligibility</td>
</tr>
<tr>
<td>2 March 18, 2024</td>
<td>Nomination Opens - Call for nomination for all EC positions will be announced on or before this date</td>
</tr>
<tr>
<td>3 April 22, 2024</td>
<td>Last date to be a member or renew membership - Only dues-paying members by this date shall be eligible to contest or vote in the election</td>
</tr>
<tr>
<td>4 April 22, 2024</td>
<td>Last date for submitting nominations for all positions to the Election Commission (11:59 PM EDT)</td>
</tr>
<tr>
<td>5 April 24, 2024</td>
<td>Publication of eligible voters which will be posted on the NAPA website (<a href="https://napaamericas.org/">https://napaamericas.org/</a>)</td>
</tr>
<tr>
<td>6 April 27, 2024</td>
<td>Last day to claim on voters list (Eligibility of voting members)</td>
</tr>
<tr>
<td>7 April 29, 2024</td>
<td>Publication of corrected/revised eligible voters list which will be posted on the NAPA website (<a href="https://napaamericas.org/">https://napaamericas.org/</a>)</td>
</tr>
<tr>
<td>8 April 30, 2024</td>
<td>A list of candidates will be posted on NAPA website (<a href="https://napaamericas.org/">https://napaamericas.org/</a>)</td>
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<tr>
<td>9 May 6, 2024</td>
<td>Last date to submit any concern about the nominated candidates to the Election Commission</td>
</tr>
<tr>
<td>10 May 8, 2024</td>
<td>Last day to withdraw nomination by candidates</td>
</tr>
<tr>
<td>11 May 10, 2024</td>
<td>Publication of the final list of candidates will be posted on the NAPA website (<a href="https://napaamericas.org/">https://napaamericas.org/</a>)</td>
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<tr>
<td>12 May 13-20, 2024</td>
<td>Online voting begins on May 13, at 8:00 AM and ends on May 20, at 11:59 PM EDT</td>
</tr>
<tr>
<td>13 May 25, 2024</td>
<td>Onsite voting at the site of the biennial convention by secret ballots (692 Maritime Boulevard, Linthicum Heights, Maryland, 21090). Voting Time: 12:00 PM – 2:00 PM EDT</td>
</tr>
<tr>
<td>14 May 26, 2024</td>
<td>Election Result Announcement at the AGM Meeting</td>
</tr>
</tbody>
</table>
NAPA Webinar Series-38 and 39

NAPA hosted the 38th Webinar, presented by Prof. Gopi Upreti. The talk was focused on his recently published book “Ecosociocentrism: The Earth First Paradigm for Sustainable Living.”

Congratulations Prof. Upreti.

NAPA hosted the 39th Webinar, presented by Dr. Keshav Bhattarai. The talk was focused on addressing seismic vulnerability and youth outmigration in Nepal. It was a great talk.

Thank you, Dr. Bhattarai.
NAPA organized an event centered around the art of crafting interdisciplinary research proposals, featuring Dr. Xiangming Xiao as the presenter. Dr. Xiao, renowned in the field for his expertise, delivered insights into the intricacies of composing effective grant proposals. The focus of the discussion was on elucidating fundamental techniques pivotal for securing successful grants in the interdisciplinary research realm.

NAPA organized a dynamic event titled "New Faculty Spotlight," focusing on the faculty position. This gathering served as a platform where students and Postdoctoral scholars received invaluable career guidance, while emerging faculty members garnered constructive feedback and forged collaborative opportunities to solidify their pioneering programs.
Call for Articles: Global Journal of Agricultural and Allied Sciences

The GJAAS Editorial Board is requesting all potential authors from around the world to submit articles for the spring 2024 issue of the journal. There are two categories of articles:

1. Full articles: original work
   • Word limit 7,500, excluding the list of cited references.
   • Total number of Tables and Figures together not exceeding 12.

2. Short communication
   • A short manuscript with original research and/or methodology with a word excluding abstract, tables, figures, and references.
   • When tables and figures are included, the manuscript should not exceed illustrations.

Visit the GJAAS site for detailed guidelines for preparing quality articles and submitting for publication: [https://gjaas.org/index.php/GJAAS/about/submissions](https://gjaas.org/index.php/GJAAS/about/submissions)

NAPA Day Celebration

On January 7, 2024, NAPA Day marked the 8th anniversary of the organization's establishment with a series of celebratory events and activities. This virtual event included the following.

Welcome and opening: General Secretary Dr. Nityanand Khanal
Highlights of NAPA’s past and future activities – President Dr. Pradeep Wagle
Agri-poem recital – Mr. Govinda Baral, Dr. Sushil Thapa
Welcome to newly joined members – Vice President Dr. Ramjee P. Ghimire
Agri-poem recital – Prof. Gopi Upreti, Dr. Bharat Shrestha
Update on 2024 Conference – Conference Organizing Committee Chair Dr. Lila B. Karki
Agri-poem recital – Dr. Krishna Nath, Dr. Pitambar Dahal
Update on Endowment Fund – Endowment Board Chair Dr. Megha N. Parajulee
Song/Music – Mr. Raju Thada Magar and friends
Agri-poem recital – Dr. Nityananda Khanal
Closing Remarks - Vice President Dr. Ramjee P. Ghimire
Karnali Exports Goats Worth NPR 3.24 Billion
As per the Ministry of Land Management, Agriculture, and Cooperative Development of Karnali Province, the region has earned NPR 3.24 billion from goat exports in the fiscal year 2022/23. The province Minister Bhim Prakash Sharma also briefed on other achievements including exports of vegetables, kiwi, ginger, and milk worth totaling NPR 240 million from various districts.

(Card January 25, The Himalayan Times)

Cardamom Export Thrives Despite Production Challenges
Despite a significant drop in production, the exports of cardamon have generated promising revenue nearly the same as that in the previous year during the present fiscal year 2022/23. The rise in cardamom prices helped compensate for the decline in export volume despite lowered production. Statistics showed the total cardamom export worth NPR 5.17 billion in the first eight months of the current fiscal year compared to NPR 5.86 billion during the same period of the previous fiscal year.

(March 24, The Rising Nepal)

Government, Milk Producers Agree on Five Points
The agreement has been concluded between the government and milk producers, following a symbolic act of protests by pouring down milk on the streets pressurizing the government to facilitate pending payments amounting to about NPR 7 billion for the milk sales. The Ministry of Agriculture and Livestock Development of Nepal along with the Central Dairy Cooperative Association Limited reached an agreement to close out the payables to milk farmers by April 3, 2024. Following the agreement, farmers have suspended the ongoing protest for now.

(March 3, myRepublica)

Farmers Protest by Throwing Fish on Roads
In the district of Sarlahi, fish farmers protested by throwing fish on the road at Phuljor Chowk in demand of electricity supply at subsidized price rates as provisioned for the agricultural sector instead of current supply charges at industrial rates from the Nepal Electricity Authority. In the protest, the slogans against the high tariffs were chimed by the farmers along with the blockade of the highway. The protest was joined by Mr. Manoj Acharya, the Mayor of Ishwarpur Municipality along with other local political leaders, lending support to the demand of the fish farmers.

(March 22, ekantipur)

Rice Imports Decline, Wheat Surges
In a recently conducted trade review, imports of paddy and rice decreased by 45 percent compared to the corresponding same period in the last fiscal year 2022/23. According to the Ministry of Agriculture and Livestock Development, rice production increased adding up to a total production of 5.724 million tonnes, turning out as the highest production record in Nepal to date. This record-high production is linked to the decline in rice imports. Meanwhile, there was a significant increase in wheat imports by 67 folds compared to the corresponding period of the last fiscal year.

(March 9, The Rising Nepal)
Captivating Chinese Interest in Nepali Orthodox Tea
The export of Nepali orthodox tea to China jumped by 88.31 percent generating revenue of NPR 10.53 million in the first eight months of the current fiscal year. The country exported 5 tonnes of orthodox tea to China. Globally, Nepal exported 22 tonnes of tea worth NPR 60 million during the same period. Chinese interest in Nepali tea is growing as traders visiting the country are on the rise seeking negotiations and contracting deals. Efforts are furthermore being made to explore new markets for orthodox tea, which is encouraging for the future of the tea industry, despite a slight decline in exports in recent years, overall.

(March 24, The Kathmandu Post)

Nepali Pickles Go Global
The Department of Customs, imports and reported exports of pickles over NPR 100 million in the fiscal year 2022/23. With the rise of Nepali origins living abroad worldwide, the demand for Nepalese pickles is on the rise in several countries, and the sales are expected to grow even more in the future. The Nepal-produced vegetable and meat-based pickles are gaining popularity and making a presence on foreign store shelves such as in the USA, Australia, Canada, Belgium, the UK, Korea, and others.

(January 21, The Kathmandu Post)

Sugar Industries Face Shortages in Sugarcane Supply
Industries are facing a shortage of sugarcane raw material for sugar production, despite the season of sugarcane production presently. As a result, the sugar industries have not been able to operate at full production capacities. Consequently, the manufacturers have claimed for the increased cost of sugar. The issue is likely to worsen even further, as, the sugarcane farmers are reported to gradually shifting to alternative crops concerning a lack of payments for the produce supplied to the sugarcane industries for a long time for a few years now.

(February 14, The Rising Nepal)

FAO Plans to Boost Exports
The Food and Agriculture Organization of the United Nations (FAO) has launched the Hand in Hand Initiative program in Nepal, partnering with investors and businessmen to commercialize Nepal's export-oriented agricultural products. The program prioritizes major export-oriented produce such as cardamom, pepper, ginger, pangasius species of fish, potatoes, yak cheese, and Himalayan honey. FAO has called for investment for production and the promotion of such products in helping to achieve the much-needed economic transformation in agricultural production in Nepal.

(March 11, Gorkhapatra)
Grain sorghum (*Sorghum bicolor* L. Moench), also known as milo, is a versatile cereal crop cultivated for its grains, which are used for human consumption, animal feed, and industrial purposes. It is drought-tolerant and can thrive in semi-arid regions, making it an essential crop in areas with limited water availability. With its gluten-free nature and nutritional profile rich in fiber and antioxidants, grain sorghum is gaining popularity as a healthy alternative in various food products worldwide. **Source: Sushil Thapa**
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 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 established an EFAB in January 2021. The EFAB envisages 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 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
- **Gold Sponsor** ≥ $5000
- **Bronze Sponsor** ≥ $1000
- **Diamond Sponsor** ≥ $7000
- **Silver Sponsor** ≥ $3000
- **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.

**Please support NAPA with your kind donations!**
Thank you everyone!

Endowment Fund Advisory Board

---

ENDOWMENT FUND ADVISORY BOARD
~ESTD. 2020~

**Chair**
Dr. Megha N. Parajulee

**Founding Chair and Director**
Dr. Lila B. Karki

**Director**
Dr. Pradeep Wagle

**Member Secretary/Outreach and Investment Coordinator**
Dr. Aditya R. Khanal

**Outreach and Investment Coordinator**
Dr. Basu D. Bhandari

“The Endowment Fund Advisory Board has already received a pledge commitment of over $110,000.00

---

www.napaamericas.org
Membership Update (March 31, 2024)

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<th>Membership Type</th>
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<tr>
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<td>Associate Student Member - Nepal</td>
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<td>Family - Joint Life Member</td>
<td>6</td>
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<td><strong>Total</strong></td>
<td><strong>359</strong></td>
</tr>
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</table>

Welcome New Members

**Regular Member**
- Dr. Safal Kshetri

**Student Member**
- Amrit Dumre
- Saugat Khanal
- Sangam Dangal
- Roshani Shrestha
- Ajay Dhukuchhu
- Kushal Naharki
- Nabin Bhandari
- Pabitra Joshi
- Apkshya Senchuri
- Shreeya Kisi
- Arati Joshi
- Rupak Karn
- Bishal Dhakal
- Ritesh K. Yadav
- Sravan Kumar Sanathanam
- Madan Sapkota
- Shreesha Pandeyaa
- Dipesh Oli
- Pratima Subedi
- Anmol Kandel
- Biwek Gairhe
- Prabhat Poudyal
- Sudha Bhandari
- Santosh Paudel
- Dipak Khanal
- Kamal Bahadur Sunar

**Associate Student Member – Nepal**
- Aarju Aryal

**Life Member**
- Dr. Rajan Shrestha
- Dr. Vitalis Temu
- Dr. Purushottam Prasad Mainali
- Dr. Pabitra Aryal
- Dr. Sailesh Adhikari

**Associate Life Member**
- Dr. Ram Chandra Bhujel
- Mohammad Hussein Azad
- Mohammad Shahanavaz Ali
- Basu Dev Kaphle
- Dr. Nanda Prasad Shrestha
- Dr. Sailesh Adhikari
- Dr. Vitalis Temu
- Dr. Rajan Shrestha
- Dr. Purushottam Prasad Mainali
- Dr. Pabitra Aryal
- Dr. Sailesh Adhikari

**Current Affiliation**
- Washington State University, USA
- Oklahoma State University, USA
- Oklahoma State University, USA
- Murray State University, USA
- Michigan State University, USA
- North Dakota State University, USA
- West Virginia University, USA
- Auburn University, USA
- University of Idaho, USA
- Kimberly Research and Extension Center, USA
- University of Alberta, Canada
- University of Florida, USA
- Texas Tech University, USA
- The Ohio State University, USA
- Agriculture and AgriFood Canada, Canada
- Alabama A&M University, USA
- Texas A&M University, USA
- Kentucky State University, USA
- Kentucky State University, USA
- Tennessee State University, USA
- University of Maryland, USA
- University of Maryland College Park, USA
- North Dakota State University, USA
- Kentucky State University, USA
- Kentucky State University, USA
- Texas A&M University, USA
- Hiroshima University, Japan
- IAAS, Tribhuvan University, Nepal
- Texas A&M AgriLife Research, USA
- Virginia State University, USA
- Dayton, Ohio, USA
- Virginia Tech, USA
- Virginia Tech, USA
- Asian Institute of Technology, Thailand
- Nepal Agricultural Research Council, Nepal
- Nepal Agricultural Research Council, Nepal
- Ministry of Agriculture and Livestock Development, Nepal
- Lalitpur, Nepal
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 recruiter(s) 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

Please check for more details on Joining NAPA at [http://napaamericas.org/join-napa.php](http://napaamericas.org/join-napa.php) and membership type and fees at [http://napaamericas.org/membership.php](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.
Association of Nepalese Agricultural Professionals of Americas (NAPA)

NAPA Membership Drive Committee seeks to create a database of students, faculty, researcher, and other professionals of agriculture and allied fields in public, private and nonprofit institutions, industries, and enterprises working in Americas, Nepal and beyond; establish contact with potential NAPA members and promote awareness about NAPA's vision, mission, goals, objectives, and activities; conduct membership drive; inform members in advance their membership; and regularly update the membership directory on the NAPA website. NAPA membership pool has nine categories including honorary members, senior members, and members for the eligible spouse.

Table 1. Membership fees and eligibility.

<table>
<thead>
<tr>
<th>Membership type</th>
<th>Fee</th>
<th>Eligibility</th>
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<tbody>
<tr>
<td>Regular Member</td>
<td>USD 50 (for two years)</td>
<td>Individuals who hold at least an undergraduate or bachelor or equivalent degree in agriculture or allied areas</td>
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<tr>
<td>Student Member</td>
<td>USD 25 (for two years)</td>
<td>Current students of agricultural and allied areas of studies who are in good standing student status.</td>
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<tr>
<td>Life Member</td>
<td>USD 200 (one time)</td>
<td>Individuals having met regular/general member's category and pay defined dues at a time.</td>
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<tr>
<td>Life Member (eligible spouse)</td>
<td>USD 100 (one time)</td>
<td>Eligible spouse of Life members</td>
</tr>
<tr>
<td>Family (Joint) Member</td>
<td>USD 15 (for two years) or USD 50 (one time for Life Membership)</td>
<td>Spouse of a member of any of the five categories (regular/general, student, life, honorary, and associate), who is not eligible for other categories of membership. Family members will not have voting right.</td>
</tr>
<tr>
<td>Associate Membership (outside Nepal)</td>
<td>USD 25 (for two years) or USD 100 (one time for Life Membership)</td>
<td>Interested individuals who do not qualify for membership types above. Associate members shall not have a voting right and shall not be eligible for the candidate of the Executive Committee. An Associate member may become Associate Life member with the payment of defined dues at a time.</td>
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<tr>
<td>Associate Life Membership from Nepal</td>
<td>NPR 5,000 (one time)</td>
<td>Interested individuals who do not qualify for membership types above. One-time membership fee of NRs. 5,000.00 (five thousand rupees) to become Associate Life Member.</td>
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<td>Associate Student Membership from Nepal</td>
<td>NPR 1,000 (one time)</td>
<td>Undergraduate and graduate students in good standing in Nepal. One-time membership fee of NRs. 1,000.00 (one thousand rupees) to become Associate Student Member as long as they are a student in Nepal.</td>
</tr>
</tbody>
</table>

NAPA is for and by members. Please join NAPA and request your friends and family to join too. We would like to request eligible and interested people to join the NAPA family and work together with other fellow members. You can access this link to join NAPA: https://napaamericas.org/join-napa.php.
**NAPA Committees**

<table>
<thead>
<tr>
<th>Executive Committee (EC) (2022-2024)</th>
<th>Student Coordination Committee (SCC)</th>
<th>Global Journal of Agricultural and Allied Sciences (GJAAS)</th>
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<tr>
<td>President</td>
<td>Chair</td>
<td>Editor-in-Chief</td>
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<tr>
<td>Dr. Pradeep Wagle</td>
<td>Mr. Madhav Parajuli</td>
<td>Dr. Uma Karki</td>
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<tr>
<td>Vice President</td>
<td>Member Secretary</td>
<td>Managing Editors</td>
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<tr>
<td>Dr. Ramjee Ghimire</td>
<td>Mr. Bipin Neupane</td>
<td>Dr. Aditya R. Khanal</td>
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<tr>
<td>General Secretary</td>
<td>Members</td>
<td>Dr. Ananta Raj Acharya</td>
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<tr>
<td>Dr. Nityananda Khanal</td>
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<td>Dr. Bharat Pokharel</td>
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<td>Joint Secretary</td>
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<td>Editors</td>
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<td>Dr. Sushil Thapa</td>
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<td>Dr. Chakra Budhathoki</td>
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<td>Treasurer</td>
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<td><strong>Endowment Fund Advisory Board (EFAB)</strong></td>
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<tr>
<td>Chair: Dr. Megha N. Parajulee</td>
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<td><strong>Founding Chair and Director</strong></td>
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<td>Dr. Lila B. Karki</td>
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<td><strong>Member Secretary/Outreach and Investment Coordinator</strong></td>
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<tr>
<td><strong>Award and Recognition Committee (ARC)</strong></td>
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<td><strong>Research and Capacity Building Committee (RCBC)</strong></td>
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<td>Dr. Keshav Sharma</td>
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<td>Dr. Santosh Dhakal</td>
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<td><strong>Webinar Committee (WC)</strong></td>
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<td>Ms. Sujata Bogati</td>
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</table>

*Agri-Connection, Volume 9, Issue 1 - March 2024*
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!**
Introduction

Rice (*Oryza sativa* L.) is one of the major staple food crops critical for food and nutritional security for more than 50% of the global population (Kumar et al., 2022). Thereupon, it is important to ensure stable and increased rice production to feed the growing human population (Roychowdhury et al., 2012). Globally, rice production is estimated at 513.54 million metric tons in 2023/24 (Statistia, 2024). The crop is cultivated across more than 95 countries in about 11% of the world’s arable land, and about 90% of rice is produced in Asia (Bista, 2018).

Conventionally, rice is grown by puddling the rice fields and transplanting the seedlings (TPR) in the puddled wet planting beds. This method offers benefits such as enhanced nutrient mobility, weed suppression, and a stable yield (Kumar et al., 2022). However, the standing water in the conventional lowland paddy field increases the risks of arsenic toxicity and emission of significant amounts of greenhouse gases, primarily methane gas (Kumar et al., 2016). Therefore, the conventional rice farming system requires reconsideration for alternative sustainable ways that can cope with the challenges posed by climate change and the increased food demands. Globally, producers have increasingly shown interest in exploring alternative rice cultivation techniques (Nawaz et al., 2019). One such potential alternative to address the concerns is the Direct Seeded Rice (DSR) technique.

Direct seeding practice involves rice cultivation from seeds sown in the field instead of transplanting seedlings from the nursery (Farooq et al., 2011). The field requires a minimum of sufficient moisture for successful germination in DSR unlike that of flooded conditions in the TPR method (Cabangon et al., 2002). The role of DSR has been realized as crucial, particularly in Asian countries with low income and high population growth rates, and the demand is estimated to increase by 30-50% over the next 30 years (Mortimer et al., 2008). At present, 23% of rice cultivation is under direct-seeding practice worldwide (Rao et al., 2007). The article briefly describes the methods of DSR.

Methods of direct seeded rice (DSR)

The methods of DSR as described by Joshi et al. (2013) are as follows:

I. **DSR with dry seeding (dry-DSR):** It involves the sowing of seeds in the field with optimum moisture conditions. Seeds are sown with pre-sowing irrigation to enhance a good seed germination rate and establishment before the onset of monsoons. This method may be practiced using different approaches:

- Broadcasting of dry seeds on unpuddled soil after Zero-till or Conventional-till
- Dibble method in a well-prepared field
- Drilling of seeds in rows with Zero Till or conventional till, minimum till using a power tiller-operated seeder.

II. **DSR with wet seeding (wet-DSR):** The wet-DSR involves the sowing of pre-germinated seeds on or into puddled soil. Seeds can either be broadcasted or sown in-line using a drum seeder. Sowing pre-germinated seeds on the surface of puddled soil leads to aerobic Wet-DSR and conversely, when sown into puddled soil implies anaerobic Wet-DSR.

III. **Water seeding:** Water seeding is widely practiced in irrigated lowlands with 5-15 cm standing water.

Desirable traits of rice cultivars suitable for DSR

- Lodging resistance (Mackill et al., 1996)
- Early seedling vigor for weed competitiveness (Zhao et al., 2006)
- Vigorous root system for better anchorage and soil moisture extraction (Pantuwan et al., 2002)
- Anaerobic germination capability (Ismail et al., 2009)
- Rapid shoot and root growth (Cui et al., 2002)
- High crop growth rate during the reproductive phase (Kato et al., 2009)
Advantages of DSR

- Saves irrigation water use by 30–50% (Kumar et al., 2019).
- Reduces greenhouse gas emissions (primarily, methane) (Singh et al., 2005).
- Saves about 40% of labor needs for nursery raising, uprooting, and transplanting of the seedlings (Pandey & Velasco, 2002).
- Maintains soil aggregates, reduces percolation losses, avoids the formation of hard pans in the root zone, and ensures favorable soil conditions for succeeding crops (Sharma et al., 2003; Bista, 2018).
- Eliminates transplanting shock in DSR and promotes early maturity (7-10 days) which facilitates timely harvest and sowing of subsequent crops (Parthasarathi et al., 2012).

Disadvantages of DSR

- Potential yield reduction of as much as 10% (Qureshi et al., 2004).
- In wet and water seeding at the surface level, the lodging problem becomes prominent at maturity (Balasubramanian & Hill, 2002).
- High tendency of disease outbreaks like rice blast, sheath blight, sheath rot, and pests like brown planthopper, rice thrips, green leafhopper, and gall midge (Pongprasert, 1995).
- Decrease in nutrient uptake by rice roots (Johnson et al., 2005).
- High occurrence of root-knot nematode, which results in severe crop damage (Prot et al., 1994).
- DSR reduces the emission of CH4 however increases the emission of N2O (especially under dry-DSR) (Qureshi et al., 2004).

Conclusion

Direct-seeded rice offers a water-smart solution for sustainable rice production, offering benefits in terms of water savings, labor efficiency, and better soil health. The DSR is a technically and economically feasible cultivation tool, an eco-friendly alternative to conventional puddled transplanted rice. However, realizing the full potential of DSR requires addressing challenges related to weed management, seedbed preparation, and varietal development. Policymakers and government agencies should support and promote DSR practice in rice farming systems through investments and marketing support measures.

References


Transforming Rice...


Phytoacoustics and its Vital Role in Plant Life

Amrit Neupane
Agriculture & Forestry University (AFU), Chitwan, Nepal
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1. Introduction
Phytoacoustics is the scientific study of sound production, perception, and responses in plants. It studies how plants detect sound and the effects of different sound frequencies and intensities on their growth and development. Living organisms use sound waves to interact with one another and understand the environment (Morales et al., 2010). Plants are often considered less advanced compared to higher animals because they solely respond to touch stimuli, while the latter possess four other sense organs. This raises the question of whether plants can produce and detect sounds (Bhandawat et al., 2022). In the past, "Green Music" was played to plants by farmers and some scientists in China and South Korea to enhance plant health and yield (Qin et al., 2003). Also, recent studies have shed light on the relationship between plants and sound waves, revealing effects on growth, development, and even protein synthesis. Furthermore, there is emerging evidence that suggests plants can produce sounds, paving the way for further exploration into their potential for acoustic communication (Chowdhury et al., 2015, Mishra et al., 2016).

2. How do plants emit sound? (Production)
In the past, it was believed that plants do not require sounds as they lack specialized organ systems for emitting, perceiving, and processing sound, but recent research using highly sensitive sound sensors has shown that plants can emit high-frequency sounds on their own (Bhandawat et al., 2022). A process known as cavitation is one of the ways that plants make sound. This process is prevalent in water-deficient conditions such as droughts. During this process, sound is emitted because of air bubbles rapidly bursting and obstructing the water transport system during transpiration pull, inducing stress in the xylem tissues (Hölttä et al., 2005). In another study, emerging maize roots emitted a distinct, spike-like sound that is not associated with cavitation (Gagliano et al., 2012). This possibly indicates that plants have diverse mechanisms for generating sound, some of which are responsive to their environments.

3. Influence of sound on plant growth (Perception)
It has long been known that certain frequencies of sound can be absorbed by plants, causing them to resonate, and that sound waves can alter a plant’s cell cycle (Frongia et al., 2020). Despite lacking specialized organs, neural networks, or brains similar to animal species, plants still possess the ability to perceive their environment, gather information through alternative methods, and make optimal responses (Lamers et al., 2020). Plants, unlike animals, are stationary and show subtle reactions often unnoticeable. Yet, they have been observed to detect sound waves through protoplasm, aiding in enhancing their growth efficiency (Ankur et al., 2016). Loud and disruptive noises are believed to deteriorate the mood and health of plants, as well as affect the blossoms. Conversely, gentle and rhythmic music is best for plant growth, flower development, and overall health; potentially by a speeded rate of growth and development (Anindita and Anshu, 2015). According to Reddy et al. (2013), Indian classical ragas positively affect the total amount of protein produced by plants including soybean, wheat, spinach, horse gram, and paddy. Musical vibrations also stimulate the germination of zest and okra seeds (Anindita and Anshu, 2015).

4. An experiment: how plants responses to musical sounds?
Numerous investigations have been carried out on the impact of music on plant development. Some research indicates that the germination rate of seeds can be significantly influenced by musical sound, as compared to a control group without sound (Creath et al., 2004). Nevertheless, the precise mechanism behind sound effects on plants remains unknown; therefore, it is essential to discover the process and build models to utilize sound technology for potential benefits. Patel et al. (2016) tested the hypothesis that plants are responsive...
Phytoacoustics ...

te to vibrations and showcased that playing Ancient Indian Traditional Chants can enhance plant growth more effectively and rapidly.

5. Methodology of the experiment (Patel et al., 2016)

- Seeds of mung beans (*Vigna radiata*) were chosen because of their rapid growth rate.
- Selected seeds were potted and placed in three separate environmental chambers (20 seeds in each chamber).
- Chambers were soundproof and covered with glass with temperature control.
- The first plant was kept in silence (VR1), the second was exposed to Sanskrit shlokas (VR2), and the third was subjected to discouraging words (VR3).
- Equal water and light energy were provided to all chambers.
- Recordings were played daily for two hours in each chamber.
- Data were recorded on shoot elongation and leaf axis length.

Table 1. Observation of the experiment (source: Patel et al., 2016)

<table>
<thead>
<tr>
<th>Sound Treatments</th>
<th>Shoot Length</th>
<th>Leaf Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>VR1</td>
<td>9-10 cm</td>
<td>1 cm (Partially open leaves)</td>
</tr>
<tr>
<td>VR2</td>
<td>11-13 cm</td>
<td>1 cm (Partially open leaves)</td>
</tr>
<tr>
<td>VR3</td>
<td>5-7 cm</td>
<td>1 cm (Closed leaves)</td>
</tr>
</tbody>
</table>

The observed results (Table 1.) confirmed the hypothesis with findings that Ancient Traditional Chants (VR2) enhanced the absorption of vibrations in mungbean species, resulting in significantly faster and more pronounced effects on seed growth.

6. Conclusion
The field of Phytoacoustics is rapidly growing and holds significant potential for the areas of agriculture, ecology, and plant biology. The study of the complex interaction between sound waves and plant physiology can open up new possibilities. The research conducted by Patel Ankur and his team is one of the noteworthy additions to the agricultural field, demonstrating the potential of sound interventions to improve plant growth and health. As we move forward, it is important to continue research in phytoacoustics to understand more about the mechanisms that drive plant responses to sound stimuli, including the specific frequencies, rhythms, and intensities that can promote optimal plant growth. Studying the long-term effects of sound exposure on plant health, resilience to stress, and ecosystem dynamics is crucial for future sustainable agricultural practices and conservation efforts.

References


**Introduction**

Natural enemies of pests are known as biological control agents, which include parasites, predators, and pathogens (Sathe & Margaj, 2001). Predators, such as ladybirds, are free-living insects that attack numerous prey for survival. Several species of ladybird beetles (LBB) act as biological control agents for many pests including aphids (Dreistadt, 2001). There are many ways to control insect populations. For aphid control, the use of ladybird beetles is a widely-known, and largely effective method (Mushtaq et al., 2015). Some species of ladybird beetle, however, are pests for attacking vegetative parts of plants (Watts, 2004). Ladybird beetles belong to the class Insecta and the family Coccinellidae. Similar to many other insects, these beetles have an external skeleton called an exoskeleton (Minks & Harrewijn, 2008). A very distinctive shape makes it easy to identify. Importantly, the larval and adult stages of the ladybird beetle are very hostile to aphids and several other small insects and mites (Hangay and Zborowski, 2010).

Aphids are economically important pests in agriculture and forestry. The insects feed on phloem sap through their highly efficient modified mouthparts consisting of long and flexible stylets. The adaptation to phytophagy is completed by a highly ductile reproductive system capable of alternating biparental and parthenogenetic generations (Guerrieri and Digilio, 2008). This ability to reproduce asexually makes these insects highly successful from a zoological point of view. Several studies have been conducted to comprehensively control aphids using natural enemies, ladybird beetles (Hangay & Zborowski, 2010).

**Food and feeding habit**

Predatory ladybirds feed on several other insects including aphids, coccids, diapsids, pentatomids, and mites. Non-predatory ladybird species feed on fungi, pollen, and honeydew. The dietary breadth of predatory ladybirds results from seasonal abundance and synchrony of prey characteristics concerning potential prey and the morphology, chemistry, and behavior of the prey (Omkar, 2016). A ladybird's diet is directly related to reproduction (Hodek et al., 2012). There are only certain foods that support both the development and reproduction of the ladybirds (essential foods) while others are for survival (alternative foods) (Hodek et al., 2012).

**Reproduction**

Morphologically, ladybirds could potentially be identified by different body patterns for sexual differentiation (Omkar and Pervez, 2000; Omkar and Pathak, 2007). However, this dimorphism is uncommon among ladybirds. Nevertheless, they do show sexual dimorphism in terms of size, with females usually being larger than males. Even though they go through a similar developmental cycle, males consistently have smaller body sizes than females (Dixon, 2000). In the case of maturity, ladybird males mature earlier than females and exhibit subtle courtship (approach, watch, examine, embrace, and mount) before entering into mating (Omkar and Pervez, 2005). Ladybird eggs are bright yellow. The females lay eggs in groups of about 5 – 50, on the undersides of leaves to protect them from flying predators and the weather. Larvae undergo four instars before pupation and form adults. When the eggs first hatch, they're mostly gray or black having yellow, orange, and red spots on the back (Sarwar, 2010). Larvae grow into sizes less than 1 mm to about 1 cm in length. The large larvae may travel up to 12 m in search of prey, which grow full size in 2-3 weeks (Sarwar, 2010). The last larval instars pupate while attaching to a leaf, stem, or other surfaces and emerge as another adult ladybug (Sarwar, 2010).
Ladybird Beetle as a Biocontrol Agent for Aphids

Biological control strategies involve the approach of using ladybird beetles to combat aphids either through the introduction of new species into the ecosystem or by enhancing the efficacy of existing ones. Dey (2015) outlined several bio-control strategies which are as follows:

- **Conservation of ladybird beetle population**: Resident populations of ladybird beetle are conserved or enhanced by modification of the environment or existing practices. The aim is to reduce the effect of the pest, not to yield complete control.

- **Classical control (also called inoculative control)**: This involves an intentional introduction of ladybird species for permanent establishment and long-term pest control. This is the most widespread and successful approach to biological control. It is generally applied for invasive exotic pests in outdoor conditions.

- **Augmentation**: The release of extra predators (ladybird beetle) where the pest (aphid) should be controlled.

- **Inundation or mass release**: Large numbers of predators are released for immediate and short-term pest control. They often cannot maintain a population after release, so they must be re-applied to sustain the establishment and pest control benefits.

- **Seasonal inoculation**: Fewer individuals are released, and reproduction at the place of release is expected. Both generations, released and their progeny contribute to pest control for an extended period but are not a tool of permanent control.

**Conclusion**

Understanding pests' behavior, feeding habits, and reproductive patterns provides essential guidance for effective pest management. Ladybird beetles offer effective solutions for aphid control through various biocontrol strategies. Such strategic control including preservation, introduction, or augmentation of ladybird populations, can help mitigate aphid infestations sustainably.

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Background

South Asia inhabits approximately 3.5% of the Earth's total land area while being home to around 24% of the world's population (World Bank, 2020). This designates a significant population density within the region comparative to its landmass. South Asia is a region recognized for its cultural diversity, comprising countries such as India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, and the Maldives (United Nations, 2020). It extends an area of approximately 5 million square kilometers and is home to over 1.8 billion people, making it one of the most densely populated regions globally (United Nations, 2020). In spite of significant economic growth in recent years, South Asia continues to cope with high levels of poverty, with a considerable portion of its population living below the poverty line. This poverty is often characterized by inadequate access to basic requirements such as food, clean water, healthcare, and education.

Thrifty, South Asia's performance varies across countries, with India being the largest economy in the region. Speedy urbanization, industrialization, and advancements in technology have contributed to economic development, but challenges such as income inequality and unemployment persist. South Asia's economies are united into the global market, with industries extending from agriculture and manufacturing to services like information technology and tourism. Though, the region also faces obstacles such as political instability, corruption, and infrastructural deficiencies, hindering its full economic potential on the world stage. In nutshell, South Asia is a culturally rich and densely populated region facing significant challenges in poverty alleviation and economic development, despite its integration into the global economy.

Social mobilization has been a crucial force driving political and socio-economic change in South Asian countries, including Nepal and India (Khan, 2015). In particular, Nepal has a long history of social mobilization, with several movements till the present-day time-course, such as the Jana Andolan and Madhesi movements, playing a significant role in the country's transition to democracy and securing the rights for marginalized groups (Shrestha, 2018). Despite many challenges faced by South Asian countries, including poverty, political instability, and religious and ethnic conflicts, social mobilization remains an effective tool for bringing about desired changes. In recent years, social media has become an increasingly effective and important platform for mobilizing citizens and raising awareness of social issues (Ahmed, 2019). Civil society organizations have also played a significant role in advocating for change and holding governments and corporations accountable (Gupta, 2017). However, at the same time, it is especially important to be cautious about what we are looking for and how we use social media as a tool for social mobilization. Information disseminated on social media is often not true lacking verified sources, therefore ensuring the creditworthiness and authenticity of the news in social media, at times could be challenging.

Social mobilization has not only been instrumental in promoting social justice and political change, but this has also had a positive impact on economic development in the region (Kumar, 2019). By empowering citizens to act and pressurizing governments for accountability, social mobilization has helped to promote greater transparency, accountability, and good governance, which are all essential for smooth and equitable economic growth and development (Mahmood, 2018). As an effective tool for promoting social justice, political change, and economic development, social mobilization is essential for building a more equitable, inclusive, and sustainable society in the region. In this essay, we will explore the history, current trends, and outcomes of social mobilization activities in several countries of the South Asian region (Haque, 2020)

India

India has a long history of social mobilization, with the Indian independence movement being one of the most prominent examples (Gupta, 2016). Today, social mobilization in India is perpetuated in many forms, includ-
Social Mobilization ...

In recent years, social mobilization has had a significant impact in advancing women's rights in the country (Sharma, 2019). The #MeToo movement, which gained great traction across India in 2018, led to a successful way to the legislation of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act in 2013 (Sinha, 2020). The movement also led to the resignation of several high-profile individuals, accused of sexual misconduct. Civil society organizations, such as the People's Union for Civil Liberties and the Centre for Social Justice, have been instrumental in advocating for human rights, social justice, and environmental protection in India (Reddy, 2017). The Centre for Social Justice, for instance, has worked to ensure that marginalized communities have access to basic amenities like drinking water and sanitation (Kumar, 2018).

Pakistan

Social mobilization has shaped Pakistan's political and social landscape. The Pakistan Movement, which led to the country's independence from British India in 1947, is a prominent example of social mobilization (Khan, 2015). Today, social mobilization in Pakistan is leveraged to address issues like corruption, violence against women, and religious extremism. The Aurat March, an annual women's rights march held in major cities across the country, is an example of a successful social mobilization campaign (Malik, 2019). The march helped raise awareness about issues of gender-based pay gaps, domestic violence, and women's participation in politics. Civil society organizations, such as the Human Rights Commission of Pakistan and the Aurat Foundation, have been instrumental in advocating for human rights and social justice in the country (Ahmed, 2018). The Human Rights Commission of Pakistan has documented human rights abuses in the country and holds the government accountable for its actions in such regards (Raza, 2020).

Bangladesh

Social mobilization has been a critical driver of political and social changes in Bangladesh. The country's movement for independence from Pakistan in 1971 was a prominent example of social mobilization (Rahman, 2017). Today, social mobilization in Bangladesh is popularly exercised to address climate change, women's empowerment, and human rights issues. The Bangladesh Centre for Advanced Studies has worked to promote sustainable development and address the impacts of climate change on vulnerable communities (Hossain, 2019). The student-led protests demanding better road safety and sound governance in 2018, including the recent protests on sexual violence against women, are examples of successful social mobilization campaigns (Islam, 2020). Such protests have increased awareness on issues related to road safety, gender-based violence, and good governance. Civil society organizations, such as the Bangladesh Centre for Advanced Studies and the Ain o Salish Kendra, have been pivotal in advocating for environmental protection, human rights, and social justice in the country (Kabir, 2018).

Sri Lanka

The Samurdhi Program was introduced in Sri Lanka in 1995 as a poverty alleviation program that aimed to uplift the living standards of the poor through a range of activities including income generation, skills development, and social welfare services (Samurdhi Authority, 2017). The program provided support to around 1.4 million households across the country, with a focus on empowering women and marginalized communities (Jayaweera, 2018). The success of the program is evident from the fact that poverty incidence declined from 26.1% in 1995 to 6.7% in 2016 (Department of Census and Statistics, Sri Lanka).

The Mahaweli Development Program, likewise, was initiated in 1978 to develop the Mahaweli River basin in Sri Lanka (Gunaratne, 2010). The program focused on providing irrigation facilities, hydroelectric power, and settlement opportunities to people in the region. It also provided training and support for small and medium enterprises, leading to a growth in income levels and a reduction in poverty rates.

Overall, these programs demonstrated how social mobilization can be an effective tool for poverty alleviation and better development. Social mobilization towards empowering marginalized communities, promoting collective decision-making actions and resource management, and providing access to basic services and employment opportunities, will likely lead to significant improvements in socio-economic conditions in Sri Lanka. While social mobilization is not a solution for all economic challenges, it can contribute to the country's recovery by promoting inclusive development and people’s participation.

Nepal

Social mobilization in Nepal has been catered to seeking political and social changes since the 1950s. The pro-democracy movement of the 1990s, which led to the restoration of democracy, was a significant social mobilization campaign (Adhikari, 2015). Today, social mobilization in Nepal has steered in various capacities and means to address issues like corruption, human rights abuses, and environmental protection (Bhattarai, 2018). The recent campaigns against the practice of chhaupadi and child marriage, among others, are examples of positive social mobilization campaigns (Pant et al., 2019). The
Social Mobilization ...

campaigns have helped raise awareness about traditional ill-practices and gender equality. Civil society organizations, such as the Informal Sector Service Centre and the National Human Rights Commission, have been active in advocating for human rights and social justice for deprived people (Dhakal, 2017). The Informal Sector Service Centre has worked effectively to largely achieve its purpose (Thapa, 2020).

Besides, social mobilization has played a significant role in poverty alleviation in rural Nepal. With the positive role of social mobilization, communities have been able to come together to identify their problems, find solutions, and take suitable actions (Shrestha, 2018). The then Government of Nepal had identified poverty reduction as a top priority and has recognized social mobilization as a key strategy towards this goal (Government of Nepal, 2016). This approach aimed to empower individuals economically, socially, and politically, together promoting good governance through increased participation, equity, transparency, and accountability. The government plans to extend social mobilization throughout the country, with experiences gained in this field that would serve as a guide for future efforts.

One such successful initiative is the South Asia Poverty Alleviation Program (SAPAP), which developed a decentralization-based holistic model of social mobilization in 1994 (Sharma, 2015). This model has been widely replicated throughout the country and has received positive feedback from local and national level bodies for its effectiveness in improving the quality of life in rural and urban areas of Nepal. Among many models used in the past for alleviating rural poverty in Nepal, the Community Development Programme (CDP) for poverty alleviation was proven remarkably effective in the prevailing scenario, which was also based on the South Asia Poverty Alleviation Program (SAPAP) (Thapa, 2017). The SAPAP model was designed to decentralize decision-making processes and increase the participation of marginalized communities in the local development process. The CDP was one of the programs that adopted this model, and it aimed to improve the socio-economic conditions of rural communities through the promotion of community development and participatory approaches. The CDP has been recognized for its success in reducing poverty and improving the quality of life for marginalized communities.

The CDP was initiated in the mid-1990s to reduce poverty in rural areas of Nepal (Government of Nepal, 2018). The program focused on the formation of community-based organizations and the promotion of social mobilization to encourage collective action towards poverty alleviation. Under the CDP, communities were encouraged to form self-help groups and cooperatives to increase their access to resources and to develop income-generating activities. The program also promoted community-led initiatives for physical infrastructure development such as schools, health clinics, and roads. Social mobilization was a key component of the CDP, as it helped to build community ownership and meaningful participation in the program. Communities were encouraged to identify their problems and to find solutions. The program also provided capacity building training and support to community members to cope with the problems, seek solutions and implement them.

A study by the World Bank found that the program led to an increase in household income, improved access to social services, and an increase in the number of community-led initiatives for poverty reduction (World Bank, 2019). The study also reported an increased participation of women in community-based organizations and decision-making processes.

In addition to the CDP, social mobilization has also been used to promote sustainable agriculture and natural resource management in rural Nepal. The Federation of Community Forestry Users Nepal (FEFOFUN) is an example of a successful social mobilization campaign that has promoted community forestry management in Nepal (FEFOFUN, 2020). FEFOFUN has helped to build community-based organizations for the management and preservation of forest resources, which has led to an increase in forest cover while improving the community’s livelihoods.

Conclusion

Social mobilization has played a critical role in poverty alleviation in rural Nepal. Rural Nepal is characterized by scenic landscapes and traditional villages, where agriculture serves as the primary livelihood (Central Bureau of Statistics Nepal, 2021). However, rural areas face challenges such as limited access to basic services like healthcare and education (World Bank, 2020). Infrastructure deficiencies, including poor roads and lack of electricity, further hinder development (Government of Nepal, 2019). Additionally, issues like poverty, food insecurity, and vulnerability to natural disasters persist (United Nations Nepal, 2020). Programs like the CDP and initiatives like the promotion of community forestry management have been successful in reducing poverty, improving access to social services, and promoting sustainable development in rural areas of Nepal. By promoting community ownership and participation, social mobilization has empowered communities to take action towards their development and to improve their overall livelihoods.
Social Mobilization ...

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कृषि कविता
- सुबोध अधिकारी

कृषक र कर्मको फल

धेरै सुनेको, कर्मको फल भिडो हुनै सक्न।
तर आफूले त्यो कुन फल हो कृषि?
चाख खोज्दा खोज्दै जीवन जान लायो।

हुन त कर्म पति थरीरीका होलान,
कुन कुन कर्मका फल भिडा?
कुन कुन कर्मका फल भिडा?
खे, को हो छद्माहुने आधार?
अनि कसले धेरै निषिद्ध रुपमा छद्माहुने?

हुन त आफू कृषि अन्न र फलफूल उत्पाद गर्न माछौ, के पो गनुं र अरु कर्मका फलका कुरा।
मेरै उमेदको धिमेको काजीको छोरा शुके खेतीपाती गन छोडो बेलोमा सदरमुकम प्रायो खान त सधैँ मन पत्थर उसलाई तर आफू खेतबारीमा काम गरिएको अन्न उत्पादन मन थिएन अरु गर्न छन्न र अरु कर्मका फलका कुरा।
अनि हामीलाई भन्नौ, निमीहरू फोरी, कर्मको पतिना गनाउने दिनभरी काम गरे पति भेलुका खान धेरै-धेरै हुने गनुं छैन मलाई त्यो दुख।

त्यतिबेला हामो अवस्था उसले भनेको जस्तै थियो श्रम पसिना अन्न र जीवन चर्चा को द्वारमा थियो शुके लगायत मेरा धेरै नै दौरीहरू सहर पसे पनि आफू कर्मको फल मिठो हुने लोभमा कृषि कान्नियाबाट आफूनै परिवार वा पार्दै अनि शुके जस्ता सहरबासी धेरैको जीवन धान्ने र अनि आहार पुर्णाउने इच्छा र आकांक्षा बोकाउँदै संघर्ष गरिएको हुने।
तर धेरै कार्मको जाल्लाई ता?
असरका कुरा मानिएका?
फल छान्न र समयमा टिप्पना छुट्ना की?
फलको स्वाद ठाउँ जिन्न जिन्न नै टिप्पना की?
मलाई त कर्मको फल मिठो कुरा सकेन।

(आ. सुबोध अधिकारी युनिभर्सिटी अफ आयडाहोमा कार्यरत हुनुहुन्छ।)

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