

COMMUNICATING FOREST SCIENCE MANUAL

2024



COMMUNICATING FOREST SCIENCE MANUAL 2024

Edited by:

Jennifer Hayes, Jose Bolaños, Ewa Hermanowicz,
Marion Karmann, Yasmeen Sands, Gesche
Schifferdecker, Cathy Watson, Gerda Wolfrum

Suggested citation: Hermanowicz, E., Hayes, J., Watson, C., and Sands, Y. (eds). 2024 Communicating Forest Science Manual 2024. the International Union of Forest Research Organizations (IUFRO) Communications & Public Relations Working Party, Vienna.

Design and layout: Iz Principa, Sonia Pust

Copy-editing and proofreading: Gillian Pavey, Wordhouse Writing Services

[Communicating Forest Science Manual 2024](#) published and printed in 2024 by The International Union of Forest Research Organizations (IUFRO) Communications & Public Relations Working Party and the LIFE SySTEMiC project, is licensed under CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0/>

The LIFE SySTEMiC project has received funding from the LIFE programme of the European Union.

ISBN: 978-3-903345-31-7

Acknowledgements

This 2024 *Communicating Forest Science Manual 2.0* would not have been possible without our volunteer authors and assistant editors. We are grateful for their time, commitment, and enthusiasm.

Overall Coordination: Ewa Hermanowicz, leader of the IUFRO Working Party on Communications and Public Relations

Lead Editor: Jennifer Hayes

Final Editor: Yasmeen Sands

Editor - LIFE SySTEMiC: Boris Rantaša

Chapter Authors: Mercy Derkyi, Vitalie Gulca, Yoly Gutiérrez, Leila Rossa Mouawad, Sandesh KC, Kemal Okumuş, Sara Santiago, Gesche Schifferdecker, Stefanie Steinebach, Giorgio Vacchiano, Cathy Watson.

Case Study Authors: Uta-Rein Atebeh Lekah, Jose Bolaños, Katrina Borromeo, Rachana Chettri, Jad Daley, Ilaria Dalla Vecchia, Mercy Derkyi, Marianela Argüello Leiva, Mary Ann Llanza, Imae Ann Mojado, Alberto Pauletto, Boris Rantaša, Nitchanun Tantapong, Giorgio Vacchiano.

A special note of thanks to Cathy Watson, who coordinated Chapter 8, ensuring case studies covered all regions and spanned multiple topics. Thanks to Leila Rossa Mouawad for checking formatting consistency across the chapters and to Yasmeen Sands for final proofreading.

Editors: Jennifer Hayes, Jose Bolaños, Ewa Hermanowicz, Marion Karmann, Yasmeen Sands, Gesche Schifferdecker, Cathy Watson, Gerda Wolfrum

We are proud to have five regions (Africa, Europe, North America, South America, Asia) and numerous countries represented by this group, including: Austria, Costa Rica, Cameroon, Ghana, Germany, Italy, Lebanon, Kenya, Moldova, Nepal, Peru, Poland, Slovenia, Thailand, Turkey, United Kingdom, and the United States.

Preface by **Ewa Hermanowicz** and **Jennifer Hayes**

Over the last decade, significant change has occurred with rapid technological innovation, shifting global dynamics and geopolitics, a worldwide pandemic, and a fracturing and reconstructing of communication approaches. Artificial intelligence, misinformation campaigns, podcasting, social media, and a recognition of the importance of science communication have all evolved.

The previous *2014 Communicating Forest Science Manual* was innovative for its time. Communicating effectively about forest science seemed more important than ever then and still is today. The role of forests in addressing the global challenges such as climate change, biodiversity loss, and human health issues are critical to convey. As populations move more to urban areas, keeping people connected to forests, and informed on forest science, are of continued importance.

In 2019, [the IUFRO 9.01.02 Communication and Public Relations Working Party](#) leaders (Ewa Hermanowicz, Jennifer Hayes, Yasmeen Sands, and Sheila Mbiru) set forth a workplan that was quickly shattered by the 2020 coronavirus pandemic. One benefit to communication from this time was the growth of an expanded access to virtual meeting and networking platforms. Our Working Party embraced this technological change to remain connected and through iterative dialogue realized that we could still bring benefits to the IUFRO network, even if we could not do it in person. We determined that our most impactful contribution during this time for IUFRO was to create a collective resource to improve the ability of scientists and others to communicate about forests.



We used the *2014 Manual* as a basis for this new one – keeping the ‘evergreen’ chapters on topics such as communication strategies, but giving them a fresh look. We revamped the chapters on media engagement and social media – disciplines that saw drastic changes over the last decade. There is a wealth of new content in this edition, including a chapter on forest psychology and fresh perspectives on best practices illustrated through case studies.

This *2024 Communicating Forest Science Manual* will be available in an online format – to allow it to be a living document, where hyperlinks can be updated and added, and content modified based on the current context.

We hope that you find this manual useful – whether you are a forest scientist who is only interested in increasing media engagement and skimming through the rest, or a seasoned communication professional who has worked in forest science communications for several years.

Ewa and Jennifer

Ewa Hermanowicz, Coordinator of the 2024 Manual and the IUFRO Working Party on Communication and Public Relations (Forest Stewardship Council International)

Jennifer Hayes, Lead Editor of the 2024 Manual and Deputy Coordinator of the IUFRO Working Party on Communication and Public Relations (USDA Forest Service, USA)

Foreword from the **LIFE SySTEMiC** Project

Prof. Dr Donatella Paffetti, Dr Cristina Vettori, and
Boris Rantaša

The influence of climate change on forest systems is acknowledged worldwide, and its effects (rising temperatures, intense storms, severe droughts, forest fires, etc.) are increasingly visible in European and Mediterranean forests. These changes present new challenges for sustainable forest management (SFM), requiring innovative approaches to protect and preserve these vital natural resources. One such approach recognizes the crucial role of genetic diversity in helping forests cope with climate change and other threats. Genetic diversity serves as the foundation for the long-term evolutionary processes that enable forests to maintain their adaptive potential in the face of environmental changes. It is within this context that the [LIFE SySTEMiC](#) project (Close-to-nature foreSt SusTainABLE Management under Climate Changes) emerges as a vital initiative.

The adaptation to climate change and the required changes in SFM can be achieved within the interplay of forest science, policy, practice, and public sentiment. LIFE SySTEMiC provides a platform for communication and knowledge transfer in the forest management, tree nursery, and other crucial sectors. Heavily characterized by the COVID-19 pandemic, the project activities provided the digital know-how on stakeholder involvement and participation, and produced educational [project demonstration site videos](#). The international character and reach of project activities made the post-forest fire restoration activities more informed and efficient, and ensured the international dissemination and replicability of project results.

LIFE SySTEMiC features several publications on the scientific and practical aspects of SFM for genetic and biodiversity. Within the project application, we had anticipated the need for a communication handbook, which would help in the challenges of simplifying the often complex messages, and navigating the modern communication and media landscapes. When we realized that IUFRO was preparing such a manual, it made perfect sense to contribute a case study and include this manual within the project framework. We are honoured to be able to contribute to its publication and dissemination.

The primary aim of the project is to harness the power of genetic diversity to safeguard our forests against the impacts of climate change. The underlying principle is straightforward: the greater the genetic diversity of the trees within a forest, the higher the likelihood that some trees will possess genetic traits that enhance their adaptability to changing climatic conditions. This diversity increases both the resistance and resilience of forest ecosystems, providing a robust defence against the uncertainties of a changing climate.

Therefore, the LIFE SySTEMiC project has several key objectives:

1. Investigate relationships: Examine the connections between forest management practices and genetic diversity across eight forest tree species in three European countries (Croatia, Italy, and Slovenia). The aim is to identify silvicultural systems that maintain high levels of genetic diversity.
2. Develop innovative models: Create the genetic biodiversity and silvicultural model (GenBioSilvi), which integrates advanced landscape genomics, applied genetics, and silvicultural practices. This model will support SFM by providing a comprehensive tool for managing forests in a way that enhances genetic diversity.
3. Dissemination and transfer knowledge: Spread awareness of the GenBioSilvi method across Europe and facilitate its adoption in forestry practice by engaging a wide range of stakeholders.

The beneficiaries of the GenBioSilvi tool are numerous and varied. Forest owners, forest managers, and forest offices at national, regional, and local levels will find the tool invaluable. Academic

and research institutions, forest certification schemes, and all organizations involved in forest protection and biodiversity conservation will also benefit from its application. By fostering a deeper understanding of the interplay between genetic diversity and forest management, the LIFE SySTEMiC project aims to promote more resilient and sustainable forest ecosystems across Europe.

As we confront the realities of climate change, the insights and innovations generated by the LIFE SySTEMiC project will be indispensable. By leveraging genetic adaptive diversity as a tool for forest preservation, we can enhance the ability of our forests to thrive amid the challenges of the future, ensuring their health and vitality for generations to come.

The LIFE SySTEMiC project (Close-to-nature forest sustainable management practices under climate changes) started in September 2019 and finished in August 2024. It was coordinated by Prof. Dr Donatella Paffetti and managed by Dr Cristina Vettori from the leading partner, the University of Florence, Department of Agriculture, Food Environment and Forestry. In total, there are seven project partners: Regional Park Migliarino San Rossore Massaciuccoli, D.R.E.A.M Italia, and Unione dei Comuni Montani del Casentino from Italy; the Slovenian Forestry Institute and Slovenia Forest Service from Slovenia, and the Croatian Forest Research Institute from Croatia. The LIFE SySTEMiC project has received funding from the LIFE programme of the European Union.



Summary of Chapters

CHAPTER 1: **Successful Communication of Forest Science**

Models provide a foundation for strategic forest science communication, offering insight into essential activities ranging from message development to audience identification. Drawing from this theoretical knowledge, this chapter helps forest science communicators to identify the best mode for engaging with their audience.

CHAPTER 2: **Communications Strategy**

A communications strategy serves as a road map for planning, implementing, and measuring the success of forest science communication activities. This comprehensive chapter highlights eight key elements of an actionable strategy and provides practical tips for creating your own and taking your communication to the next level.

CHAPTER 3: **Internal Communication**

Communication is not limited to external audiences; communication within and among forest science organizations – internal communication – is also a vital activity. This chapter discusses the value of internal communication and offers tips on improving it in organizations.

CHAPTER 4: **New Media**

New media is computer-based technology that facilitates user interaction, and its use has grown exponentially in recent years,

including in forest science sectors. This chapter describes new media technologies, highlights opportunities for harnessing these ever-emerging tools, and provides tips on how to do so most effectively in forest science organizations.

CHAPTER 5: **Media Engagement in the Digital Era**

Engaging with media outlets is a worthwhile investment in forest science communication. This substantial chapter is a primer on the topic, offering practical guidance and tips on everything from pitching your story to media, creating a media toolkit, handling interviews in various formats, and countering science misinformation.

CHAPTER 6: **Keynote Presentations and Storytelling**

The scientific keynote presentation brings conference attendees together and sets the theme for the conference. Integrating storytelling can make these presentations more memorable, effective, and engaging. This chapter outlines the power of scientific storytelling and how to develop a narrative within a keynote presentation.

CHAPTER 7: **Forest Psychology: Effective Wording and Framing in Forest Communication**

Science is grounded in its objectivity, but that does not mean that the subjective doesn't have a role. Centred on the concept of 'framing', this chapter explores how emotions are important considerations in forest science communication, allowing communicators to explore their own motivations, appeal to their audiences, and adopt a style where emotions operate in tandem with fact-based scientific results.

CHAPTER 8: **Case studies - Introduction by by Cathy Watson, CIFOR-ICRAF**

Repeated lessons learned included 'use true and personal stories' and 'bite-sized information', have a 'relatable tone' and collaborate with others, and 'nurture alliances'. 'Keep going and do not give up' was another theme. This chapter provides inspired reading from organizations communicating the frontline - from the forests of Italy to the urban forests of New Jersey city Newark, to Goriški Kras forest, which experienced the largest fire in Slovenia's history.

Case studies:

1. Communicating About Payments for Environmental Services: The Case of Costa Rica
2. Communicating the Science Around the Certification of Sustainable Cork from the Management of *Quercus* sp. Forests in Sardinia
3. Forestry Communication Approaches During the Largest Forest Fire in Slovenia
4. Three Key Steps to Build a Nationwide Tree Equity Movement
5. Using a Knowledge, Attitude, and Practice Survey to Develop Communication Campaigns to Combat Forest Crime in the Lower Mekong region
6. Branching Out: IUFRO's Forest Podcast
7. Forest Science Communication by Environmental NGOs in Cameroon: the case of ERuDeF and FODER
8. Trees4All: Public Engagement, Monitoring, and Outcome Reporting for Diversified Tree Farming
9. A New Wave of Forest Communication in Italy: How an Academic Organization Turned Itself into a Popular Resource for Ordinary People

Table of Contents

Acknowledgements 3

Preface by Ewa Hermanowicz and Jennifer Hayes 4

Foreword from the LIFE SySTEMiC Project 7

Summary of Chapters 10

Full List of Authors and Editors with Affiliations and Contact Details 16

CHAPTER 1.

Successful Communication of Forest Science 19

Applying Different Communication Concepts in Forest Science Communication 20

Key Questions for Forest Science Communicators 21

Providing Knowledge to Decision Makers 21

Conclusion 22

References 23

CHAPTER 2.

Communication Strategy 25

The Role of Public Relations in Communicating Forest Science 26

Building an Effective Communication Strategy 26

Evaluation – Measuring Your Performance 34

Helpful Tips 35

References and Further Reading 35

CHAPTER 3.

Internal Communication 37

Internal Communication Defined 37

The Value of Internal Communication 38

Structuring Internal Communication 39

Improving Internal Communication 40

CHAPTER 4.

New Media 41

- Overview 41
- Opportunities 42
- Challenges 42
- How to Effectively Use New Media 43
- Conclusion 55

CHAPTER 5.

Media Engagement in the Digital Era 57

- Introduction 57
- Five Reasons Why Forestry Organizations Should be Thinking About Media Engagement 58
- Understanding the Media Environment Today 58
- What is Media Engagement? 59
- How Do Forestry Organizations Engage with the Media? 60
- Opportunities Within Specialized Media 60
- Engaging with Media in Times of Fake News and Misinformation 61
- The ABCs of Media Engagement 62
- From Pitch to Publish: Tips to Get Media Coverage 68
- News Media Toolkit 70
- Handling Interviews 71
- Conclusion 76
- More Useful Links 76

CHAPTER 6.

Storytelling for Effective Scientific Keynote

Presentations 77

- Introduction to the Scientific Keynote Message 77
- The Power of Scientific Storytelling 78
- Outlining the Presentation 78
- Designing and Delivering the Presentation 80
- Practising Communicating 82
- References 83

CHAPTER 7.

Forest Psychology: Effective Wording and Framing in

Forest Communication 85

- Introduction 85
- Emotions, Thoughts, and How They Work 88
- Emotions, Values, and Forests 90
- Strategic Use of Emotions in Forest Communication 93
- Framing - What it Means and How it Works 94

How to Frame	96
Building Trust in Forest Communicators	100
Becoming an Emotional Expert	102
References	103

CHAPTER 8.

Case Studies 111

Case Study 1: Communicating About Payments for Environmental Services: The Case of Costa Rica	113
--	-----

Case Study 2: Communicating the Science Around the Certification of Sustainable Cork from the Management of Quercus sp. Forests in Sardinia	120
---	-----

Case Study 3: Forestry Communication Approaches During the Largest Forest Fire in Slovenia	126
---	-----

Case Study 4: Three Key Steps to Building a Nationwide Tree Equity Movement	139
--	-----

Case Study 5: Using a Knowledge, Attitude, and Practice Survey to Develop Communication Campaigns to Combat Forest Crime in the Lower Mekong Region	148
---	-----

Case Study 6: Branching Out: IUFRO's Forest Podcast	158
---	-----

Case Study 7: Forest Science Communication by Environmental NGOs in Cameroon: the case of ERuDeF and FODER	164
---	-----

Case Study 8: Trees4All: Public Engagement, Monitoring, and Outcome Reporting for Diversified Tree Farming	173
---	-----

Case Study 9: A New Wave of Forest Communication in Italy: How an Academic Organization Turned Itself into a Popular Resource for Ordinary People	180
---	-----

Full List of **Authors and Editors** with Affiliations and Contact Details

Marianela **Argüello Leiva**,
Communicator and Knowledge
Management Officer,
Environmental Economics
and Sustainable Agribusiness
Research Unit (UEAAS/EfD),
CATIE: marguello@catie.ac.cr

Uta-Rein **Atebeh Lekah**,
Office Manager in Charge
of Professional Orientation
and Developmental Support,
Directorate of Academic Affairs
and Cooperation, University of
Yaoundé I, Cameroon:
rein.bcyui@gmail.com

Jose **Bolaños**,
Communications Manager,
IUFRO: bolanos@iufro.org

Katrina **Borromeo**,
REDD+ Knowledge and
Advocacy Coordinator,
United Nations Environment
Programme/ UN-REDD
Programme:
katrina.borromeo@un.org

Rachana **Chettri**,
Editorial and Publishing Officer,
RECOFTC:
rachana.chettri@recoftc.org

Jad **Daley**,
American Forests, United States:
jdaley@americanforests.org

Ilaria **Dalla Vecchia**,
Forest Management Standard
Manager, Forest Stewardship
Council (FSC) Italy:
i.dallavecchia@it.fsc.org

Mercy **Derkyi**,
Associate Professor in Forest
Science, University of Energy
and Natural Resources, Ghana:
mercy.derkyi@uenr.edu.gh

Vitalie **Gulca**,
Head of the Forestry and Public
Gardens Programme, Technical
University of Moldova: vitalie.
gulca@gmail.com

Yoly **Gutiérrez**,
Regional Communications
Coordinator, Latin America and
the Caribbean, CIFOR-ICRAF:
y.gutierrez@cifor-icraf.org

Jennifer **Hayes**,
National Sustainable
Operations Coordinator, Forest
Service, United States:
jennifer.hayes@usda.gov

Ewa **Hermanowicz**,
Senior Regional
Communications Manager,
Forest Stewardship Council
(FSC): e.hermanowicz@fsc.org

Marion **Karmann**,
Senior Research Relations
Manager, Forest Stewardship
Council (FSC):
m.karmann@fsc.org

Kemal **Okumus**,
Forest Engineer, Foreign
Relations Training & Research
Department, General
Directorate of Forestry, Turkey:
kemalokumus@ogm.gov.tr

Mary Ann **Lianza**,
Director, Knowledge
Management, IT and Strategic
Communication, RECOFTC:
maryann.lianza@recoftc.org

Imae Ann **Mojado**,
Communication and Engagement
Manager, RECOFTC:
imaeann.mojado@recoftc.org

Leila Rossa **Mouawad**,
Member of the Forest
Communicators Network for the
Mediterranean and Near East /
Mediterranean Youth Task Force:
Irmouawad@gmail.com

Sandesh K C,
Member of International
Forestry Students' Association
(IFSA): sandesh@ifsa.net

Nitchanun **Tantapong**,
Communication Officer,
RECOFTC Thailand:
nitchanun.ttp@gmail.com,
nitchanun.tantapong@recoftc.org

Alberto **Pauletto**,
Communications Manager,
Forest Stewardship Council
(FSC) Italy: a.pauletto@it.fsc.org

Boris **Rantaša**,
Lead Expert Associate,
Slovenian Forestry Institute:
boris.rantasa@gozdis.si

Yasmeen **Sands**,
Public Affairs Specialist, Pacific
Northwest Research Station,
Forest Service, United States:
yasmeen.sands@usda.gov

Sara **Santiago**,
Assistant Director, The Forest
School at the Yale School of the
Environment:
sara.santiago@yale.edu

Gesche **Schifferdecker**,
Communications Manager,
European Forest Institute (EFI):
gesche.schifferdecker@efi.int

Stefanie **Steinebach**,
Professor of Communication
and Environmental Education,
University of Applied Forest
Sciences Rottenburg, Germany:
steinebach@hs-rottenburg.de

Giorgio **Vacchiano**,
Associate Professor in Forest
Management and Planning,
University of Milan, Italy:
giorgio.vacchiano@unimi.it

Cathy **Watson**,
Senior Advisor, CIFOR-ICRAF:
c.watson@CIFOR-ICRAF.org;
cathyhwatson@gmail.com

Gerda **Wolfrum**,
Communications Coordinator,
IUFRO: wolfrum@iufro.org

SUCCESSFUL COMMUNICATION OF FOREST SCIENCE

Gerben Janse and Gesche Schifferdecker

1 CHAPTER

Forest scientists are challenged to communicate in a world where messages are sent at dizzying rates across the globe. Scientists must traverse within their scientific community, in the organizations where they work, and among the many institutions and organizations that have an interest in their scientific activities and outcomes.

Communication, itself, is a field of study. One of the first models of communication included four elements: source, message, medium, and receiver. Early instrumental theories described communication as an attempt by a sender to produce a pre-defined attitudinal change in the receiver. Merten (1977) described communications as, principally, a social phenomenon with the elements of communicator, stimulus, and receiver. Human communication can be explained as social action with an intentional character; that is, very specific objectives driven by specific interests.

More recently, conceptualization of communication has distinguished between one-way and two-way models, and between asymmetric and symmetrical communication (Grunig, 2001). Asymmetric is defined as communication that is one-way, with linear causal effect that is predicted and evaluated. Symmetrical communication is two-way and called interactive communication. It is used in bargaining, negotiating, and conflict resolution to bring about changes in ideas, attitudes, and behaviours in both organizations and their publics. Finally, a third approach is the transactional model (Barnlund, 1970), which identifies communication as a circular process, with feedback loops between sender and receiver. This model also recognizes that context – including cultural contexts – plays a vital role in helping communicators navigate diverse social systems and foster mutual understanding.

Applying Different Communication Concepts in Forest Science Communication

Forest science communicators can recognize how these concepts play out in their communications. It is crucial for communicators to understand communication concepts so they can establish themselves as credible sources of scientific information and develop messaging that is relevant for their target audience. Increasingly, scientists and science communicators find themselves communicating in symmetrical and transactional scenarios, collaborating with multiple stakeholders concerned with forest-related questions. In some cases, they even have to navigate different and occasionally conflicting viewpoints on forest management and forest conservation approaches, for example – including among their peers (Hetemäki, 2019). In these settings, scientists are most likely to be heard when they share important interests with their audiences (Lupia, 2013) and when they identify what information the audience is interested in and what stakeholders' concerns are (Meenakshi, 2021). Mutual respect between scientists and their audiences is crucial; in addition, scientists listening to their audiences and inviting feedback also helps to foster successful communication.

Science communication activities can be categorized as follows (Jones-Walters, 2000; Kappel and Holmen, 2019):

- One-way information distribution (dissemination), such as sharing scientific results, promotion, and publicity;
- Two-way dialogue, such as answers to questions;
- Education, as a longer-term process to transfer knowledge;
- Dialogue with stakeholders and groups that is symmetric in nature and, perhaps, involves social networks.

Forest science communicators may find that most successful efforts involve all four of the above activities, whether they use traditional online and electronic media such as websites, newsletters, and social media, or other formats for engaging with their audiences.

Key Questions for Forest Science Communicators

Regardless of activities and methods used, successful communicators should ask themselves this key question: What are my goals? Answers range from: *I communicate science because I want to share my knowledge or I want to provide a solution to a problem or I desire a change* (in attitude, behaviour, outcome, way of doing things, etc.) (Borowiec, 2023). Further decisions can be made based on these objectives.

Another crucial question is: Who are the audiences I would like to engage with and where can I find them? Key to answering this question is an awareness of the beliefs, concerns, and values of that audience – if you get to know them better, you can tailor your message to them (Meenakshi, 2021). Also helpful is identification of the preferred communication styles (e.g. storytelling or short key facts) and channels (e.g. social media and workshops) of that audience. (You can learn more about the steps for successfully communicating forest science in Chapter 2, ‘Communication Strategy’.)

Providing Knowledge to Decision Makers

Two important audiences for forest science communication are peers and decision makers. Looking at decision makers, there is a rough division between (1) communicating scientific know-how to policymakers in the political/ bureaucratic system (i.e. as input to the formal policymaking process), and (2) communicating scientific know-how to forest managers (i.e. as input for deciding on or developing new silvicultural practices). The difference is, perhaps, largely dependent on level – the former at a higher, overarching level, and the latter at a more localized and practical one.

Forest science communication needs to be customized depending on the intended decision maker and their particular needs. Decision makers in forest policy may have specific questions for scientists (e.g. on a particular topic for which they need more information). Potential formats could be policy briefs or targeted sessions. Decision makers in the field of forest practice, on the other hand, often seek advice on issues related to silviculture or biodiversity conservation that needs to be prepared in a comprehensive way and, ideally, in native languages. Potential formats can be practitioners' magazines or field exchanges, which ensure science communicators go where this audience is.

When providing knowledge to decision makers, scientists also need to be aware that they can take different roles. As an 'issue advocate', the communicator works to convince the policymaker on one or a few choices. As an 'honest broker', the communicator provides information about all potential perspectives and then lets the decision maker make a choice (Hetemäki, 2019). Most science communicators would likely agree that the role of an honest broker is more favourable because it is objective and does not take sides; however, within forest science and the debate about forest use and protection, some scientist-communicators operate more as advocates.

Conclusion

It is crucial that any forest scientist who wants to communicate with different audiences chooses a mode of engagement they feel

comfortable with that draws on their professional strengths and maintains their scientific credibility. From this perspective, a scientist can work towards gaining the necessary trust from their audiences and make science communication an engaging process.

References

- Barnlund, D.C. (1970) A transactional model of communication. In: Mortensen, C.D., and Sereno K.K. (eds) *Foundations of Communication Theory*, p. 83. Harper & Row, New York.
- Borowiec, B.G. (2023) Ten simple rules for scientists engaging in science communication. *PLoS Computational Biology* 19(7): e1011251. doi: [10.1371/journal.pcbi.1011251](https://doi.org/10.1371/journal.pcbi.1011251)
- Grunig, J.E. (2001) Two-way symmetrical public relations: past, present, and future. In: Heath R.L. (ed) *Handbook of Public Relations*, pp. 11–30. Sage, Thousand Oaks CA, USA.
- Hetemäki, L. (2019) The role of science in forest policy – experiences by EFI. *Forest Policy and Economics*, 105, 10–16. doi: [10.1016/j.forpol.2019.05.014](https://doi.org/10.1016/j.forpol.2019.05.014)
- Jones-Walters, L. (2000) Chapter I: Communication: the basics. In: Rientjes, S. (ed) *Communicating Nature Conservation: A Manual on Using Communication in Support of Nature Conservation Policy and Action*. European Centre for Nature Conservation. Technical Report Series, Tilburg.
- Kappel, K., and Holmen, S.J. (2019) Why science communication, and does it work? A taxonomy of science communication aims and a survey of the empirical evidence. *Frontiers in Communications* 4(55). doi: [10.3389/fcomm.2019.00055](https://doi.org/10.3389/fcomm.2019.00055)
- Lupia, A. (2013) Communicating science in politicized environments. *Proceedings of the National Academy of Sciences of the USA*. 110 (Suppl. 3): 14048–14054. doi: [10.1073/pnas.1212726110](https://doi.org/10.1073/pnas.1212726110)
- Meenakshi, J. (2021). How to be a good science communicator. *Nature Medicine* 27(10), 1656–1658. doi: [10.1038/s41591-021-01528-x](https://doi.org/10.1038/s41591-021-01528-x)
- Merten, K. (1977) Kommunikation: eine Begriffs- und Prozessanalyse. *Studien zur Sozialwissenschaft*. Westdeutscher Verlag, Opladen.

COMMUNICATION STRATEGY

Jessica Portelli-Ward

2. CHAPTER

The role of communications and public relations (PR) in forest science is critically important in today's fast-paced media environment. We live in a continuous global news feed where we are inundated with so much information, it can sometimes be a challenge to see the 'wood for the trees.'

Communicating forest science information is about building trust and confidence with the audience members receiving the messages. Whether the recipients are other scientists, academia, policymakers, or the public, strong, strategic, and consistent messaging are the foundation of generating public awareness.

The Role of Public Relations in Communicating Forest Science

In today's business environment, where the demand for information and accountability is continually increasing, successful public relations is becoming increasingly vital to an organization's success. Good communication is essential for conveying messaging and information between individuals or between an organization and its audiences. The Public Relations Society of America (PRSA) defines public relations as a 'strategic communication process that builds mutually beneficial relationships between organizations and their publics'. (PRSA, 2024)

But how do you build upon these relationships? What tools are needed to be able to communicate your organization's key messages to your target audiences? To answer these questions, you need to develop a communications strategy. Whether for a research institution, team, or project, an effective communication strategy includes building trust and confidence among its main objectives and outcomes.

Building an Effective Communication Strategy

Essentially, a communication strategy is organized like a business plan. An effective communication strategy can be as comprehensive or as brief as you make it. The end goal is the same, simply by focusing on which outcomes you hope to achieve. A communication strategy should include the:

1. introduction
2. objective
3. environmental scan and analysis
4. audience
5. key messages
6. work plans and tactics
7. finances
8. performance evaluation.

Introduction

This is where you provide a short general overview of the issue or project and any necessary background information.

Objective

Having a clear understanding of your objectives is a prerequisite for developing an effective strategy. You cannot make informed decisions without all the information. So, provide a brief description of the project with well-defined results in mind. What are you trying to do? What has been done in the past? Did it work? What are you trying to achieve? Is there a problem this strategy will be addressing? What's the scope of the project?

TIP: Develop SMART objectives – ensure that they're specific, measurable, achievable, realistic and time-bound.

It is important that the objective be clear and focused, specific, and realistic. Link your objectives to organizational priorities and results so that everything that follows in the communication strategy supports the organization's main objectives.

Objectives are different from goals. While goals are generally broad-based ideas or intentions, objectives are more precise and easier to evaluate. Objectives must also be measurable. Keep the priority of building trust and confidence in your stakeholders when developing these objectives.

Environmental Scan and SWOT Analysis

What does your environment look like? Identify your strengths, weaknesses, opportunities, and threats (SWOT analysis) – this analytical method is used to present and categorize internal and external factors of an organization or a specific project. A SWOT analysis can be presented in various formats, but one of the simplest ways to express all elements is in a four-point matrix or a balance sheet of sorts. Internal factors are generally identified in the strengths and weaknesses section, while external factors appear under opportunities and threats (see Table 2.1).

TABLE 2.1: SAMPLE SWOT ANALYSIS

STRENGTHS (internal-oriented):

- tools to complete work (software)
- strong teamwork
- cooperative clients
- creativity, calculated risk-takers
- effective planning process
- results-oriented
- thinking BIG PICTURE.

WEAKNESSES (internal-oriented):

- low turnover (new ideas may be limited)
- staffing levels
- scheduling, project management
- sharing expertise among staff, knowledge transfer.

OPPORTUNITIES (external factors):

- strengthening partnerships with science colleagues
- consistent and reinforced team branding
- improved integrated planning
- expanding outreach events to key clients.

THREATS (external factors):

- process, approvals, red tape
- technology upgrades that hinder output capacity
- information overload – living in a 24/7 world, making an impact with our message
- past reaction from relevant audiences (if negative).

Audience

To communicate effectively and achieve the end goals, it is vital to identify your target audience. Who are your key stakeholders? This is where it is important to identify internal and external audiences.

Break up your target audience into primary and secondary categories – the more specific and focused your target audience is, the more effective and targeted your communications will be:

- *Primary target audience(s)*: This group includes the key groups, people, or stakeholders that you want to receive the most information.
- *Secondary target audience(s)*: This group would include those individuals who would benefit from the messages from your organization but have less of a vested interest in the information.

TIP:

You can have more than one primary and secondary target audience. Over time, these groups will also change, so it's good practice to re-evaluate your priorities and your target audiences on a regular basis so you can ensure that you are targeting the right groups with the right information.

Depending on the scenario and the main objective of developing a communications strategy, the target audiences can shift. For one event or project, the primary target audience could be non-governmental organizations (NGOs), while the internal audience is listed as a secondary target. These same two groups could have exactly the opposite priorities when introduced to another communication strategy scenario. Be very specific when detailing your audiences (see Table 2.2).

TABLE 2.2: SAMPLE AUDIENCE ANALYSIS

AUDIENCE TYPE

KEY MESSAGE: The Forestry Research Institute* is committed to providing timely, relevant, and scientifically sound information on the nation's forests.

AUDIENCE TYPE

PRIMARY TARGET: Policymakers

MESSAGE

The Forestry Research Institute provides timely, relevant, and scientifically sound information and advice on national forestry issues such as wildland fire, climate change, and invasive species.

PREFERRED METHOD OF COMMUNICATION

Public opinion research, memoranda, briefing notes.

AUDIENCE TYPE

PRIMARY TARGET: forest managers

MESSAGE

The Forestry Research Institute provides timely, relevant, and scientifically sound information and advice on national issues such as wildland fire, climate change, invasive species, and the forest industry's competitive position.

PREFERRED METHOD OF COMMUNICATION

Stakeholder sessions and newsletters, proactive (earned) media articles, news releases, conferences, and workshops.

AUDIENCE TYPE

SECONDARY TARGET: research and academia

MESSAGE

The Forestry Research Institute has a worldwide reputation for scientific excellence and is a world-leader in forest research.

PREFERRED METHOD OF COMMUNICATION

Specialized research journals, science expos, conferences, and workshops.

** Forestry Research Institute is a fictional organization name that is used for illustration purposes only.*

Finally, when you have decided on the target audience, try to do some research about their interests, concerns, or questions about the topics you would like to convey to them. Consider that they might react differently to the same message, have different understandings of key terms, or other predispositions.

Key Messages

The development of key messages as part of the communications strategy is critical. To build trust and confidence with your stakeholders, the key messages must be clear and concise, particularly in dealing with complicated or controversial forest science. As an organization's spokesperson or science expert, you must be able to communicate accurate data and findings or implications. What do you want to communicate specifically – what does this audience need to know? Most communication professionals will suggest you have no more than three to five key messages that you can tailor to suit specific key audiences.

Work Plans and Media Relations Tactics

A work plan is essentially your itinerary or agenda for how you will communicate about your event or project. This is where you outline the complete details of relevant communications activities with deadlines and assigned responsibilities. You can include items such as milestones and review dates to help keep yourself or the team on track. A work plan can also include a brief outline of forecasted costs and identification of the communications lead. Work plans are living documents. It is important that they are regularly reviewed and

TIP: Social media platforms are an easy (and inexpensive) way to reach both primary and secondary target audiences. Unlike traditional websites, most social media platforms require only minimal technical knowledge and skills to create, maintain, and update. Consider having a strong social media presence. It's not only a great way to promote your organization and mandate, but also an excellent way to reach new audiences and potential stakeholders. Continuously monitor the platforms and respond when appropriate. One word of caution, though: the social media sphere is constantly evolving, so it's important to stay current.

TIP: Not all budget lines of a communication strategy have to cost money. Think of activities that can be included as in-kind contributions or supported through professional partnerships. Develop a partnership with a key media stakeholder to increase your audience reach at little or no cost to your organization. This could be an agreement with a key newspaper, which could provide your organization with monthly space for an editorial column to feature key forest science stories and experts in the field.

updated so that the team stays focused and on track to meet the objectives.

Whether you are working in the realms of internal or external communication, involving media relations as a tactic in the work plan portion of your communications strategy is an effective way to ensure that you are communicating your forest science to the appropriate audiences through the appropriate channels.

Building and maintaining trust and confidence in your science with your stakeholders should be part

of the marketing portion or media relations approach. There are many options and outlets distributing information, such as:

- press releases
- press conferences
- briefing notes
- media lines to prepare spokespersons with accurate and consistent messaging for interviews with reporters:
 - Generally, when discussing forest science, the scientist or researcher is already the subject expert. But spokesperson training or media training would be beneficial in preparing the individual for communications with the media, particularly when encountering aggressive reporters on a tight deadline.
- websites
- videos
- social media platforms (X, LinkedIn, Instagram, blogs, etc.)
- print articles in journals, newspapers, and magazines.

Finances

Any strategy, whether it be a communication plan or a business plan,

is difficult to implement without adequate financial backing. A solid communication strategy should be supported by its own budget.

The financial section is where you will identify costs and where the financial resources are coming from. Forecast advertising or membership fees and always have a contingency plan in place in case there are unforeseen costs that come into play, because there are usually at least a few!

If you do find yourself with some available funds, there are ways you can re-invest in the organization. Consider some of the potential options for putting the money to good use:

- Invest in hiring a firm to develop the campaign if communications campaigns are new to you.
- Hire a facilitator if you are hosting stakeholder sessions to better define your target audience and what they want to see. Sometimes, having a third party run engagement sessions will provide you with the most frank interpretation of your business and how you are being presented.
- Purchase extra copies of a brochure or improve a web page on your website.
- Invest the money in a web development program to run email or newsletter management software.
- Hire a research firm to engage in opinion polling, develop focus groups, or conduct a survey. Some organizations have the staffing to take care of these elements; if you don't, there are options if you have extra funding.
- Invest in media relations or spokesperson training to help your forest science experts to communicate to a variety of audiences more effectively.

TIP: Complete regular stakeholder engagement sessions to better understand the ways your organization can improve communicating its messages to your target audiences. These could be bi-annual face-to-face or Zoom meetings. Always stay on top of maintaining open lines of communication – it will ensure that you are evolving with your audience to remain relevant, and you'll have the upper hand with ever-changing priorities in today's markets.

Evaluation – Measuring Your Performance

A communication strategy can be assessed like any other business plan. Did you achieve your main objectives? Did you go over budget or did you stay on target? Are there audience members that you may have missed? Are you targeting the right audience? Did the audience get the messages you wanted them to get through the intended channels?

It is important to make the effort to gather as much data (particularly, quantitative data) as you can to assess the value of your strategy. Arriving at appropriate metrics to track communications and public relations objectives might be a challenge in some circumstances. The following mechanisms are inexpensive examples of how to measure the impact of your communication activities:

- Did you offer evaluation and feedback forms to participants at your events?
- Did traffic to a website increase after a news release went out or if an article appeared in a newspaper?
- Has there been a change to your organization’s social media profile – e.g. more X or LinkedIn followers?
- Is the coverage of your organization changing in volume or tone? If you don’t have the budget to work with a media monitoring firm (such as Cision or FPinformart), then undertake in-house monitoring using simple and freely available tools such as Google Alerts as part of your environmental scanning efforts.
- Was there an increase in requests for information from your organization following a conference or advertising spot?
- Did membership applications to the organization increase or decrease?
- Did you use the appropriate tools to communicate the message?
- Did the audience understand and interpret the intended message? Create a focus group to evaluate specific marketing campaigns and their effectiveness.

Helpful Tips

Build confidence with your stakeholders.

Respect the science-based knowledge that you are promoting.

Maintain open and active dialogue with feedback mechanisms to ensure openness and a continuous **exchange of ideas**.

Know your audience and focus your efforts on what you want them to know through targeted **key messages**. Adjust your messages, timing, and outlets accordingly.

Evolve your communication strategy based on priorities. Stay current through continuous planning, analysis, and execution.

References and Further Reading

Bernays, E.L. (2013) *Public Relations*. University of Oklahoma Press, Norman, OK, USA.

Borowiec, B.G. (2023) Ten simple rules for scientists engaging in science communication. *PLoS Computational Biology* 19(7): e1011251. doi: 10.1371/journal.pcbi.1011251

Broom, G.M., and Sha, B-L. (2012) *Cutlip and Center's Effective Public Relations*. Prentice Hall, Upper Saddle River, NJ, USA.

Grunig, J.E. (1992) *Excellence in Public Relations and Communication Management*. Routledge, New York.

Meenakshi, J. (2021) How to be a good science communicator. *Nature Medicine* 27(10), 1656-1658. doi: 10.1038/s41591-021-01528-x

PRSA (2024) Learn About Public Relations <https://www.prsa.org/prssa/about-prssa/learn-about-pr#:~:text=Public%20relations%2C%20as%20defined%20by,the%20way%20an%20organization%20is> (accessed 12 July 2024.)

Singleton, A. (2014) *The PR Masterclass: How to Develop a Public Relations Strategy That Works!* Wiley, Chichester, UK.

Smith, R.D. (2013) *Strategic Planning for Public Relations (4th ed.)*. Routledge, New York.

INTERNAL COMMUNICATION

Jim Grob, Zoë Hoyle, Michael Sullivan

3. CHAPTER

Internal Communication Defined

Internal communication is the communication that occurs among and between the members of an organization – in this case, a forest science organization. This can include distributing routine messages, sharing data, noting important milestones, and processing information valuable to the members of the organization. Internal communication occurs every day in every workplace. Formalizing internal communication helps both managers and employees through consistent information and message sharing. Although many of the same methods are used to communicate internally and externally, there are differences. Internal communication is concerned with building a cohesive mission among people who share a common knowledge base as employees of an organization.

The Value of Internal Communication

- Gives people a sense of ownership in the organization.
- Improves the work of the organization.
- Keeps people informed along vertical and horizontal lines within the organization.
- Explains decisions, issues, and events that have occurred or are scheduled.
- Allows the organization to respond quickly to change and crisis.
- Helps in problem-solving.
- Builds respect and morale among the members of the organization.
- Ensures consistency and accuracy within the entire organization, whether located together or dispersed throughout different regions.
- Promotes fairness and equity.

Many forest science organizations are structured as a network of geographically separate units. Others may be housed in one location, but separated into functional groups. In both cases, effective internal communication is impacted by how well information flows between units. This includes researchers, support staff such as communications experts, and management. The problems forest science research involves can rarely be confined to one discipline or approach. The need to collaborate on research in almost all areas becomes more pressing as the global and multidisciplinary nature of major issues (e.g. climate change) becomes more apparent. Some forest science organizations form cross-disciplinary themes within the organization, bringing together researchers from multiple units. In this structure, it is important that each unit understands each other's mission, goals, and objectives.

At the organizational level, researchers often share that the importance and significance of their work is not well understood within their own organizations. Communication experts, administrators, and managers may not be as well informed as they would like about the work being done by their researchers. Employees who do not communicate regularly with each other may lose a sense of how their work contributes to the purpose of

the organization. Employees of a forest science organization should understand that what they do is important to the overall purpose of the organization.

Structuring Internal Communication

The first step in internal communication is to form a strategy that supports the vision of the organization and defines the goals of communication. This can be as simple as ‘maximizing science’ or ‘having all employees understand the purpose of the organization’. Internal communication can also be a powerful tool for promoting change within an organization; in this case, goals and messages must be clearly defined along with ways of measuring success.

Internal communication can be achieved in a number of ways:

- study plans to newsletters (electronic or printed);
- memos, guidelines, procedures;
- meetings, seminars, field tours;
- awards ceremonies, mentoring programmes, training sessions;
- email, supervisory feedback, and social engagement opportunities.

A key role of internal communication is standardizing how and when information is transmitted and shared with staff, which is especially important when there is time-sensitive organizational information to share.

Internal communication is not a one-way flow of information, but rather a continuing conversation between and among members of an organization. Internal communication provides a way to sense the climate within the organization, as well as a means for building mutual understanding. For researchers, internal communication can be an avenue to let other people within the organization know about their work so that its importance and relevance can be conveyed more clearly to the public. To be truly effective, all communications must be two-way. There should be mechanisms in place to solicit staff members’ replies or queries. Acknowledging the concerns, ideas, and input from all elements within an organization is critical to the health and effectiveness of an organization.

Examples of internal communication within a forest science organization include:

- a leader describing how decisions will be made and how input will be considered;
- a researcher communicating a field observation, or a research need to an administrator;
- administrators sharing funding and training opportunities and seminars with researchers;
- researcher sharing a study plan with other researchers, practitioners, and administrators;
- a director emailing all employees about changes in work process and policy;
- a researcher alerting a communications office about a research programme or result;
- a communications office highlighting employee accomplishments and major research breakthroughs;
- an organization hosting meetings, cross-disciplinary seminars, and training sessions for scientists;
- researchers hosting a field trip for colleagues from other units;
- leaders sharing their organization's strategic goals;
- a team soliciting feedback on budget planning;
- supervisors setting expectations for job performance;
- employees across positions and units taking a hike or a rafting trip together.

Improving Internal Communication

As is the case with external communication, improving internal communication depends on evaluating current efforts. This can be done with a survey or, more informally, by asking for feedback, speaking with a random sample of employees, or by making internal communication a topic at a meeting or training session. Focus groups are also a very good way to find out people's thoughts and opinions about the effectiveness of internal communication methods. Evaluating the effectiveness of internal communication is a never-ending effort that can be challenging, yet very beneficial and rewarding to your organization.

NEW MEDIA

Leila Rossa Mouawad and Sandesh KC

4 CHAPTER

Overview

'New media' refers to computer-based electronic technologies. Unlike traditional media, it consists of digital tools and means to document and archive any content. Moreover, new media provides a much-needed space for [user interaction](#).

The internet, undoubtedly, is the largest database of information and source of knowledge in our modern world. In addition, the use of social media has become essential for scientists to communicate their work to the general public. More traditional methods, such as newsletters and emails, remain important and are evolving with new media tools. Podcasts, online collaboration platforms, and the use of artificial intelligence are all examples of how much media have evolved since the previous edition of this manual was published in

2014. The main challenges of today are developing strategies and messaging that allow scientists to adapt to the dynamic world of new media and cut through the information clutter.

Opportunities

The overarching benefit of new media is its speed in delivering information and scientific breakthroughs across the globe. This unique feature is especially useful for organizations that deal with time-sensitive content. Another characteristic of new media is its use of visual communication for greater engagement. Visual content in all its digital forms can help science to reach a broader audience. The past few years have prompted changes in visual content as it has been adapted to each social media platform. Some changes include the recommended length of videos (from two minutes to thirty seconds to ten seconds), the use of text-over videos, and infographic design.

New media has also created platforms for collaborations, partnerships, and community building. There are entire sites dedicated to virtual conferencing. New features on social media allow shared posts between organizations, which increases outreach and engages the audiences of both parties. Additionally, new features continue to be added to direct content towards targeted audiences, allowing forest science organizations to select who they are trying to reach on social media.

Using new media's accessibility features, communicators can make their forest science content accessible to a more diverse set of users, reducing inherent information discrimination or marginalization experienced by some audiences.

Challenges

Science and new media speak different languages. Sir David Attenborough recently said, "Saving the planet is now a communications challenge." Science has been traditionally seen as complex. If complex scientific messages are not simplified, forest science will remain a perplexing sector to many audiences. Much

of the new media communication requires shorter and simpler messaging to be effective; this is often a challenge for researchers.

Another challenge is the impact of incorrect or false information. The abundance of misinformation and disinformation can easily divert opinions and blur the truth. Most platforms, through their algorithms ([filter bubbles](#)), create [echo chambers](#). As such, users of these platforms are only exposed to selected and personalized content, limiting their access to diverse and conflicting perspectives.

Additionally, the dynamic and fast-changing nature of these platforms raises questions about their ability to persist and evolve. Moreover, the fact that most platforms offer generally broad, rather than specific, content related to forest science further threatens effective and robust communication.

Privacy, accessibility, and ethical concerns must be taken into consideration. Recent data breaches and cyber-attacks have discouraged some users from actively engaging in these platforms. This means that forest science organizations and researchers need to ensure they use multiple channels, not solely new media, to communicate.

With the latest advancements in artificial intelligence (AI), as detailed in the forthcoming section, a new set of challenges is emerging, including digital modification of content, issues surrounding intellectual property rights, and the broader ethical implications.

How to Effectively Use New Media

Websites

The World Wide Web continues to expand its seemingly endless repository of information on a multitude of subjects, including forest science. Search engines and information systems have also evolved to fit the growing supply and demand of information. Consequently, the landscapes of websites have also changed.

Consider these statistics from [Forbes Advisor](#) (current at April 2024) when developing new media strategies:

- Actively maintained and visited websites on the internet today: **192 million;**
- Time it takes for users to form an opinion about a website: **0.05 seconds;**
- Percentage of users leaving a site if it takes more than three seconds to load: **40 per cent;**
- Increase in time spent on a website that includes videos: **88 per cent;**
- Percentage of web traffic from mobile phones: **54 per cent;**
- Percentage of global traffic coming from Google: **92 per cent.**

Today, an organization's website often serves as the first point of contact with the public. A website with good design, maintenance, and regular updates reflects the professionalism and reliability of the entity it represents, thereby establishing trust with its audience. This is especially true in forest science, where accurate and up-to-date news, data, and information are crucial. In forest science, websites have served different purposes in information dissemination and communication. A few examples are:

- [IUFRO's](#) website, which serves as the face of the network of more than 15,000 scientists from 120 countries;
- [MedForest](#), an open-access, contributor-driven platform for all the latest news, views, and happenings related to Mediterranean forests;
- [Trees4All](#), a project-based website that registers data from trees that visitors can sponsor to be planted through donations.

While there is a common perception that building websites is easy, the task of crafting a credible site for an organization should not be underestimated. Despite the advent of intuitive content management systems and website builders, it is important to keep the following things in mind when creating or revamping a website:

- Building a website is not necessarily a major effort, but maintaining it is. Before building a website, consider the time, staff, and budget necessary to regularly update its web pages.
- Ensure that the website is mobile-friendly and accessible across all devices.

- Design your website content according to established [accessibility guidelines](#), to make it compatible for people with special needs.
- Offer seamless navigation in the website design to allow visitors to easily find the information they are looking for.
- Utilize [search engine optimization \(SEO\) best practices](#) to optimize your website on search engines.
- Implement strict security measures to protect the website and its users.

Emails and Newsletters

Electronic mail, or email, has been around [for decades](#), but it remains a leading online communication method despite the introduction of new and faster methods, such as social media and instant messaging. Email has withstood the test of time by evolving to become more functional and user-friendly. Initially adopted for its direct, accurate, fast, and dependable way of communicating, email is now considered useful for the detailed, structured, and thoughtful correspondence that it allows.

Amid the fleeting nature of social media exchanges, emails provide a structured record of communication. Unlike the casual tone of most online communications, emails are perceived as more credible and official. Emailing is also one of the most effective and easiest means to contact professionals across the globe. Notably, the functionality of emails has been increased through features such as automated email campaigns, email newsletters, metric analytics, and multimedia elements.

Harnessing the personal reach of emails, electronic newsletters distributed through electronic mailing lists have maintained their popularity and effectiveness in communicating news, research, events, and other information in the forest science community. IUFRO has been publishing [IUFRO News](#) since 2005 to disseminate up-to-date information on the world of forest science, education, policy, and research in a structured format.

The sheer volume of emails and newsletters that individuals receive has [increased](#), meaning many emails either end up in the spam folder

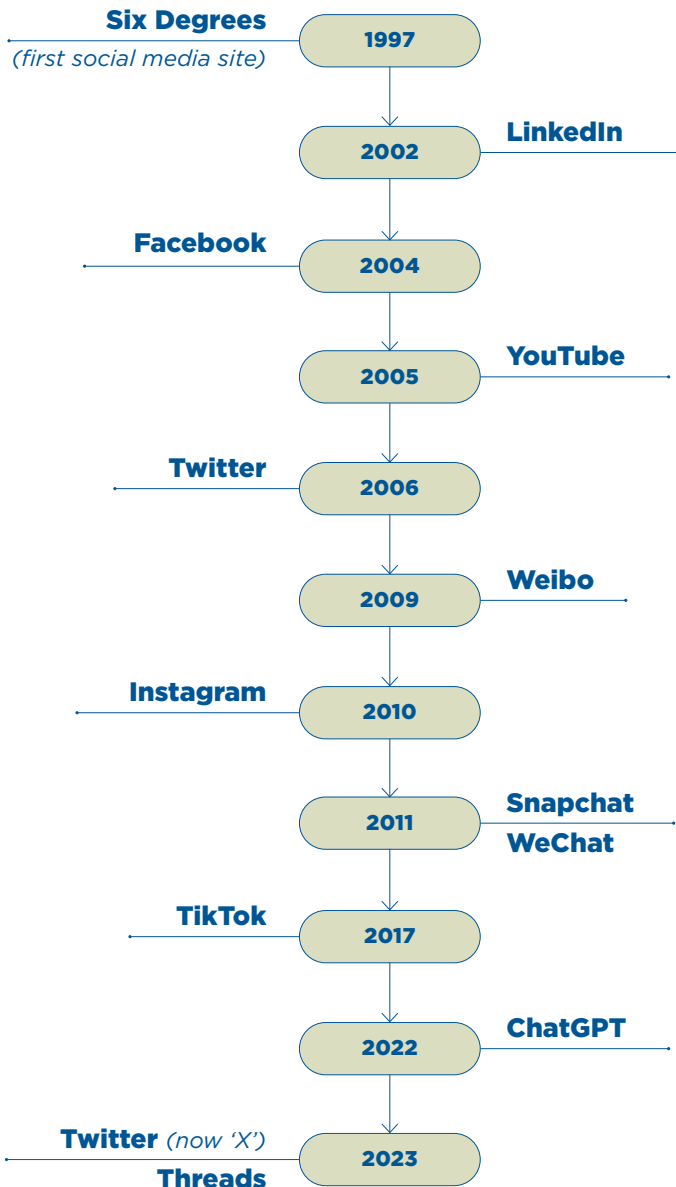
or are left unread. To ensure effective email communication and make your newsletters stand out, consider the following best practices:

- Write concise emails with clear subject lines.
- Limit the number of attachments to avoid overwhelming the recipient.
- Provide informative and relevant newsletter content that adds value to the readers.
- Use a consistent and visually appealing design.
- Include a clear call to action (e.g. reading further, or participating in a survey or event).
- Ensure your emails and newsletters are mobile-friendly.
- Keep your email list up to date.
- Allow easy unsubscribing to maintain a high engagement level.
- Encourage feedback and regularly review email analytics to gauge performance.

Social Media

Social media platforms continue to play a pivotal role in web-based communication. They serve as a dynamic and efficient tool to reach a broader audience in real time. With constant updates and new features, these platforms strive to enhance user experience and accessibility. New social media platforms continue to emerge (Table 1), and the dynamic nature of technology requires that any communicator remain flexible and discerning to ensure they can reach audiences using the methods that are most common for their geography and stakeholders.

TABLE 4.1: TIMELINE OF SOCIAL MEDIA PLATFORMS



Source: Authors.

In the current landscape, younger generations rely heavily on social media as their primary source of information, replacing books, conferences, and articles. This shift highlights the importance of sharing digestible scientific content on social media to reach a wider audience. To maximize the impact of social media, organizations must carefully design their social media strategies in a way that reflects their goals and fosters community engagement. While various social media platforms can serve this purpose, it is essential to identify the most relevant ones in our current era. As of May 2024, a few of the most prominent platforms include:

- **X:** Formerly known as Twitter, this platform serves as the leading tool for sharing quick information. X allows users to submit short posts, limited to 280 characters for regular accounts and up to 25,000 characters for premium subscriptions. This feature invites users to craft straight-to-the-point messages that are linked to a webpage for further details. Hashtags play an important role on this platform in channelling messages to the targeted audience. These can become trending and secure a broader outreach. X is most relevant in coverage of events, to build interest, share live updates, quotes, decisions, and findings.
- **Instagram:** As a platform for sharing photos, videos known as ‘reels’, and temporary posts known as ‘stories’, Instagram has gained success in recent years due to its distinctive features. Instagram reels are short video clips of up to 90 seconds that any user can easily generate, adding sound and visual effects, and editing the speed. This feature allows users to publish creative content that can show up on other users’ feeds. Instagram is also marked by the ‘stories’ feature; these are temporary posts that last for a full day and show up on the top of the screen independently from the feed. Recently, Instagram allowed cross-app posting to Facebook, and collaborative posts allowing two or more organizations to share the same content. Such features ensure that the content reaches a broader audience.
- **TikTok:** With more than 3.5 billion downloads, TikTok is one of the most popular social media platforms in our new era, particularly for youth. TikTok allows users to watch and create

short videos (15–60 seconds) or longer ones (up to three minutes) from any phone, adding filters, music, and visual effects. TikTok is increasingly used for infotainment, where influencers share informational videos with their audience. TikTok Live also allows users to interact in real time with creators. Nowadays, more organizations such as [FAO](#) are using TikTok for forest communications with specifically adapted content for youth.

Additional social media platforms widely used in forest communication are LinkedIn, YouTube, WhatsApp, and Facebook. These all contribute to driving traffic to websites, engaging audiences, and setting the stage for discussions.

The tools offered by social media can be employed to assist forest communicators in storing data, disseminating information, creating campaigns, and mobilizing the audience to take action. The key remains in matching the platform to the right audience by using relevant tools. Despite the clear advantages, many organizations remain inactive on social media, causing a gap between the scientific community and the general public. Recognizing the potential of these tools, more organizations are now acknowledging the benefits of leveraging social media to communicate scientific findings with their online communities.

Podcasts

New media does not always involve innovation of an entirely new form of media; sometimes it involves redefining and enriching existing platforms. The rise and popularity of podcasts exemplify this evolution, transforming the traditional radio format into a dynamic and interactive medium that has engaged audiences in the digital age. Podcasts offer an intimate and engaging way to share stories, research findings, and discussions on forest science. This medium allows for deep dives into topics and storytelling that captivates listeners.

Podcasts are unique from other media platforms because they allow deeper and more personal engagement with the audience. Through long-form interviews and meaningful conversations, hosts and guests can delve deeply into topics and share personal experiences that

foster a sense of community among listeners. This interaction can be leveraged to effectively bridge the gap between forest science communities and the general public.

One prime example is [IUFRO's Branching Out](#) podcast, which connects forests, science, and people by breaking down complex forest-related topics through conversations with guest experts in the field. Similarly, the [World Forest Voices](#) podcast promotes intergenerational dialogue between youth and technical experts. Likewise, IFSA's [Canopy Conservation](#) podcast provides a platform for youth to discuss forestry topics and share their IFSA experience worldwide.

Creating a successful podcast demands effort, dedication, and skill, yet launching one is accessible to anyone, from individuals to organizations, with minimal resources. Here are some best practices to consider:

- Identify an appropriate format for your podcast: interview, storytelling, or discussion.
- Plan your episodes to ensure a coherent and timely flow of content.
- Use good-quality audio and post-processing to ensure clarity and conciseness.
- Organize the logistics of hosting guests, particularly when featuring multiple participants in a discussion.
- Distribute episodes across platforms such as Apple Podcasts, Spotify, and Google Podcasts.
- Leverage your website and social media to promote episodes.
- Encourage community building and listener feedback.

Networks and Communities of Practice

Collaborative efforts among forest scientists and communicators yield a more significant impact. For instance, members of FAO's [Forest Communicators Networks](#) have successfully addressed regional forestry issues and championed sustainable forest management through both policy and practice. These individuals of diverse backgrounds and affiliations come together to exchange best practices and tools, fostering effective communication campaigns,

primarily at a regional level. Participating in capacity-building workshops and conferences further refines the ability of members to communicate crucial forest-related issues. The aim of these networks is to empower members to craft compelling messages highlighting the importance of forests.

Similarly, communities of practice such as Silva Mediterranean's [Mediterranean Forestry Network](#) provide a dynamic platform for stakeholders involved in forest science to share knowledge, experiences, events, and initiatives. These collaborative spaces serve as invaluable references for forestry issues, nurturing partnerships and fostering collaborations within the community.

Another successful example is the new GLFx digital platform for the Global Landscapes Forum community. This community of practice is designed to enable and assist community members with the connections, knowledge, and technology to connect, share, learn, and act online and in person.

Webinars and Massive Open Online Courses (MOOCs)

Webinars and MOOCs filled the gap in forest science education and communication caused by the global COVID-19 pandemic. They emerged as powerful tools for disseminating knowledge and fostering learning in forest science. These unique platforms break down geographical barriers, making education, engagement, and networks accessible to a global audience interested in forest science, conservation, research, and sustainable practices. Webinars and online courses are flexible; they use different elements including video lectures, live sessions, discussions, and quizzes. They are also flexible for the participants in terms of accessibility.

Webinars and online courses on forest-related topics can be live or archived and are offered by universities, organizations, and institutions. Online courses are usually longer than webinars as they explore the topics in more depth. Similarly, webinar series include multiple episodes on a specific theme, which allows for a more comprehensive learning experience. For instance, RECOFTC offers an [e-learning course catalogue](#) with multiple online courses on community forestry and sustainable development.

The format and content of a webinar and online courses largely depend on the topic and target audience, but here are some best practices to follow:

- Create content that is engaging, well-structured, and tailored to your audience's knowledge level.
- Ensure high-quality audio and video, and technical support and hosting.
- Include interactive elements such as quizzes, polls, and discussion forums to encourage participation.
- Involve experts with strong communication skills to lead webinars and courses.
- Provide further learning and application materials as downloadable resources.

Artificial Intelligence (AI)

AI is set to revolutionize forest science communication, introducing new ways to analyse, visualize, and disseminate data. AI is already making significant strides in the realm of forest science research, where it is used to analyse and interpret vast amounts of environmental data.

For forest science communication, the role of AI extends to translating complex research findings into engaging and understandable content for the general public. Generative AI (e.g. [ChatGPT](#)), a widely known subset of AI technologies, plays a pivotal role in this transformation when it is trained on decades of published scientific literature.

Furthermore, AI-powered tools are making forest science globally accessible by breaking down language barriers. Integrating AI-powered chatbots into websites can significantly enhance user engagement by providing instant, personalized assistance. AI-powered interactive applications, such as virtual reality, offer immersive experiences that vividly bring forest ecosystems and conservation efforts to life, fostering a deeper connection between the audience and the natural world.

While generative AI offers remarkable efficiency in content creation,

the application of AI in science communication is [not without its challenges](#). Concerns over data privacy and the need for accuracy in AI-generated content are significant. The evolving nature of AI technology necessitates a cautious approach, balancing innovation with the critical evaluation of content reliability and rights.

As AI continues to develop, its integration into forest science communication is set to make scientific knowledge more accessible, engaging, and influential. The ongoing refinement of generative AI technologies will be crucial in driving forward the global conversation on sustainable forest management, ensuring that the complexities of forest ecosystems are communicated with both precision and creativity.

The endless possibilities of using AI in communication can be exemplified with this poem, generated by ChatGPT, about this chapter.

*From emails to stories, and AI's vast sea,
Communicating the green, for you and for me.
Platforms evolve, as stories unfold,
In the digital age, forest tales are told.*

*Visuals engage, podcasts deeply connect,
Webinars and courses, knowledge they project.
With each post and tweet, a community grows,
In the language of new media, forest science flows.*

*Yet amid this progress, challenges loom,
Misinformation spreads, in the digital room.
But with careful strategy, and ethical grace,
We'll navigate new media, and find our place.*

Storytelling

While stating facts and presenting research are informative, they often lack the captivating power of storytelling. Storytellers have the ability to seize the attention of an entire audience and even to [synchronize their minds](#).

Stories are inevitably one of the most effective forms of knowledge transfer. Yet, an impactful story must be able to forge an emotional connection and spark interest. People tend to react more to a positive rather than a negative narrative, as it empowers them to take action and drive change.

Tools such as the [Youth4Nature Story Maps](#) have proven the efficacy of using storytelling to showcase the local narratives of young people on climate, biodiversity, and the environment.

Nowadays, more projects are focusing on storytelling, especially at the National Geographic Society. As such, [Entangled Destiny](#), led by [Dr Magda Bou Dagher Kharrat](#), is a multidisciplinary research and storytelling project that aims to re-establish the lost connection between people and Mediterranean trees. Similarly, [Photo Ark](#), led by Joel Sartore, leverages photography to tell stories and inspires people to initiate positive changes.

Therefore, in today's setting, new media can transport stories and connect people globally over topics such as forests. The challenge remains in sharing messages that resonate with a diverse audience by bridging their common interests. [Digital tools](#) such as infographics, photos, film, audio, and more play a crucial role in vitalizing the story and sharing it with audiences.

Measurement and Evaluation

Mastering the use of new media lies in effective monitoring and evaluation, especially in a dynamic digital era. As organizations work to establish their presence online, assessing the impact of their efforts becomes of utmost importance. Measuring key metrics can help improve campaigns to reach target audiences. While some companies are specialized in offering such services, most new media platforms are now equipped with built-in analytics tools that allow users to easily assess the impact they are generating. Statistics on aspects such as the type of content that gets the most reactions, audience engagement, and optimal timing for interaction can help organizations adjust their strategies accordingly to ensure further outreach. Additional tools include Buffer, Hootsuite, and Sprout Social. All three are social media management tools that

offer analytics across multiple platforms, allowing users to track key metrics.

To date, Google Analytics remains one of the top tools to analyse website performance. It offers real-time observations and information crucial for measurement and evaluation. For websites, analysing traffic metrics such as page views, bounce rates, and session duration provides valuable insights into user behaviour and the effectiveness of website content, design, accessibility, and user-friendliness. Google Analytics also provides detailed reports on audience demographics, acquisition sources, and content performance, enabling informed decision-making.

In summary, as the digital landscape continues to change, a data-driven approach to new media communication will remain essential for staying relevant and creating impact.

Conclusion

Anyone communicating forest science today is presented with a toolbox of unparalleled potential. While time-tested forms of digital media such as emails and websites maintain their relevance and will continue to do so, newer forms of media for example social media, podcasts, and AI are continuously merging the boundaries between the scientific community and the general public. These tools not only democratize information but also foster a deeper connection among science, policy, and practice. As we embrace new media and prepare ourselves for the uncertainty associated with its dynamism, the challenge lies in crafting messages that are both engaging and informative, breaking down complex scientific concepts into narratives that resonate across diverse audiences.

To effectively leverage new media, communicators must remain adaptable, continuously evolving with technological advancements and trends, while maintaining a commitment to accuracy and ethical standards. The balance between accessibility, scientific integrity, and feasibility is crucial; as such, this chapter serves as a guide to harnessing the power of new media to amplify the voice of forest science. By understanding the opportunities and threats associated

with new media platforms, we can transform the digital landscape into a vibrant forum for dialogue, education, and advocacy for forests and people worldwide. This is not just about disseminating information; it's about building a healthy digital community united by a shared commitment to sustainability and the stewardship of our planet's invaluable forest resources.

MEDIA ENGAGEMENT IN THE DIGITAL ERA

Yoly Gutiérrez and Kemal Okumuş

5. CHAPTER

Introduction

Is engaging with the media a good idea for forestry organizations? Absolutely. But as with any aspect of communication, strategic assessment, and planning are key. In this chapter, we provide you with foundational knowledge and guidance to help you navigate media ecosystems and decide why, when, and how to engage with journalists and editors to secure coverage that effectively communicates your desired message to your target audience via your preferred channels.

Five Reasons Why Forestry Organizations Should be Thinking About Media Engagement

While the specific impact of media engagement may vary depending on factors such as the nature of the research, the target audience, and the platform, there is substantial evidence to suggest that scientists can effectively communicate their work and contribute to positive societal outcomes through media engagement. Some of the main reasons are to:

- bridge the gap between scientific research and public understanding, making research results more relatable to non-experts and, thus, fostering public trust in science and scientists;
- reach a broader audience beyond the academic community, potentially influencing public opinion, policy decisions, and funding priorities;
- raise awareness, mobilize support, and contribute to positive societal change on important scientific issues;
- help the public distinguish between credible sources and misinformation, promoting what is called media literacy;
- help spark curiosity, encourage critical thinking, and inspire the next generation of researchers to join the forestry and environmental research arena.

Suggested reading: [Supporting Scientists' Engagement with the Media](#)

Understanding the Media Environment Today

Over the past decade, the media landscape has undergone significant changes driven by technological advancements, shifts in audience behaviour, and changes in the industry. Overall, the media landscape has become more fragmented, digital-centric, and audience-driven, creating both challenges and opportunities for the industry and consumers and, in turn, for media engagement efforts. The media environment is characterized today by the following features.

- Digital media consumption has surged, with more people accessing news through online platforms such as websites, social media, streaming services, and mobile apps – especially through mobile devices. This trend is expected to continue.
- Traditional news media such as print newspapers, public radio, and television has declined in favour of digital-first publishing models.
- The role of social media platforms as major players in news dissemination has changed, with many people relying on social networks for discovering and sharing news content over dedicated news channels.
- There has been a spread of misinformation, echo chambers, and the influence of algorithms on news and content visibility.
- User-generated content and attention-grabbing headlines or sensationalized approaches to news and stories ('click bait') have become more commonplace.
- There is diversification of on-demand content tailored to niche audiences.
- The number of formats such as podcasts and streaming has expanded.
- There is an increase in 'news avoidance' or 'news fatigue'.

Suggested reading: [Digital News Report 2023 by the Reuters Institute](#)

What is Media Engagement?

Media engagement is a process that involves actively participating in media ecosystems to connect with audiences and achieve communication goals. This includes:

- producing content to distribute through media channels (blogs, articles, press releases, videos, infographics, podcasts, social media posts, etc.);
- building media relationships (pitching stories, providing expert commentary, offering exclusive access, and nurturing partnerships);
- interacting with audiences (addressing concerns, conducting interviews, or responding to media enquiries);

- monitoring media coverage of relevant topics, issues, or organizations to identify opportunities for further engagement or intervention.

How Do Forestry Organizations Engage with the Media?

For scientific organizations such as the ones belonging to IUFRO, there are typically two ways of engaging with media outlets. The first involves proactive engagement by in-house public relations teams offering newsworthy content to media outlets. The second occurs when journalists or editors approach scientists for comment on specific matters. Either way, success depends on assessing the opportunities, placing them in the context of your larger strategy, and evaluating the potential outcomes.



Effective media engagement requires strategic planning, responsiveness, and adaptability to help navigate the evolving landscape of media trends.

Opportunities Within Specialized Media

Specialized media refers to communication outlets that focus on a specific topic or audience and cater for a particular area of interest or expertise such as science, health, the environment, or the economy. In this regard, specialized media offers good opportunities for media engagement and coverage of forestry-related matters under the economics, environment, or scientific themes, among others. In addition, many news outlets today also feature specialized sections or series dedicated specifically to climate change and environmental issues, reflecting the growing importance of these issues in the public consciousness. This is an area where forestry themes can play a large role. Examples of specialized media outlets covering forestry-related matters are:

- [Mongabay](#)
- [National Geographic](#)
- [The Guardian - Environment](#)
- [Forests News](#)
- [EFE Verde](#)

Engaging with Media in Times of Fake News and Misinformation

With the proliferation of digital media sources, concerns about misinformation, fake news, and the erosion of trust in media outlets is growing. Given this context, engaging with media requires careful navigation. Here are some tips to deal with these challenges:

- Check the profile of the media organization and make sure you only share information with trusted news professionals and outlets.
- Insist on the ability to review content before it's published and ensure you fact-check it.
- Maintain transparency and honesty in your communication with the media (for instance, by acknowledging any uncertainties or limitations in the information you provide).
- Evaluate information critically, distinguishing between fact and opinion, and be upfront about any potential biases or conflicts of interest.
- Help journalists understand the broader implications and nuances of the story. Science is not always easy to understand. Prioritize factual accuracy and clarity, stick to the evidence and data supporting your position or research findings, and avoid speculation or hyperbole.
- Monitor media coverage for any inaccuracies or fake news related to your organization or area of expertise and respond promptly to correct misinformation.

The ABCs of Media Engagement

What is News in the Context of Forestry Organizations?

Newsworthy content can be the results of a recent study, comments by experts on certain topics, events that will produce and promote discussion, or new information about a topic.

Media Channels

A media channel refers to the medium or platform used to disseminate information to the public. In the past, this would refer to traditional media outlets such as newspapers, TV, and radio. Today, media channels also include social media, digital newspapers, websites, blogs, podcasts, and streaming services.

Pitching

Pitching in media refers to the actions of contacting journalists, reporters, or editors with a story idea or proposal for coverage or commentary. The goal of pitching is to persuade them to either cover a particular topic, event, or initiative, or to give your organization an opportunity to comment on topics in their area, with the goal of being included in their coverage or generating new coverage. Pitching can take various forms, including emails, phone calls, social media messages (DMs), in-person meetings, and formats such as media advisories or press releases, which we describe later in this chapter.

Blogs and Opinion Pieces

Engaging with media can also take the form of opinion pieces, commentaries, or blogs ready to be reposted on different media channels. Take, for instance, an opinion piece on the state of forests that can be pitched to media outlets around or on the International Day of Forests. The arrangement and conditions depend on the outlet's editorial guidelines, with some channels requesting exclusive contributions and others republishing under open distribution permissions such as Creative Commons.

Media Advisories and Press Releases

Media advisories and press releases are popular tools used by organizations and companies to communicate news or information to the media. They often have a more general target than direct pitching. Media advisories and press releases are typically sent to a larger set of media outlets or journalists to generate interest in the story, event, activity, or topic in the hope of receiving coverage. There are subtle differences between media advisories and press releases, even though they both have the same goal of generating media interest.

Media advisories, also known as media alerts, are short, concise notifications sent to the media to inform them of upcoming events, press conferences, or opportunities for coverage. The goal of a media advisory is to invite media representatives to attend or cover the event. You will need to send it in advance, so they have sufficient notice to plan their coverage. Media advisories are typically brief and to the point, containing essential details about the event, such as the date, time, location, purpose, and key participants. They may also include logistical information, such as interview opportunities and who will be there. Media advisories samples:

- [Launch of the State of the World's Forests 2022](#)
- [Delivering on Glasgow: Halting and Reversing Forest Loss by 2030](#)

Press releases are formal announcements issued by organizations to the media, providing news or information about an event, product launch, milestone, organizational change, or other significant development. The goal of a press release is to generate media coverage and public attention for the news being announced. Press releases typically follow a standard format, including a headline, dateline, lead paragraph (summarizing the main news), body paragraphs (providing additional details, quotes, and background information), boilerplate (standard information about the issuing organization), and contact information for media enquiries. Sometimes media outlets will publish the press release directly or take large sections from it in writing their own story on the announcement. Press releases samples:

- [New study: Forests are still underrated as allies to curb rural poverty](#) (accessed 17 July 2024)
- [New study details carbon capture potential of agroforestry and trees on farms](#) (accessed 17 July 2024)

Media Contact List

Building and maintaining a comprehensive media contact list is essential for effective media engagement. This is a curated database or spreadsheet that contains the contact information of journalists, reporters, editors, and other media professionals you have identified that can potentially cover your news, events, or stories. A contact list typically includes the following: the name of the media professional, the media outlet they work for, their contact information, their area of coverage, and links to their social media profiles.



Build your potential media partners database by searching and listing the media and specialized media outlets that cover the topics your research focuses on. This will help you find the journalists and editors to contact when you have a story you would like covered.

Media Engagement via Conferences

Research has shown that networking environments help scientists build better relationships with media representatives and offer opportunities for interviews to support their content. Major events such as climate conferences e.g. *COP*, the *IUFRO World Congress*, and the *Global Landscapes Forum*, help invited journalists source potential stories or locate expert voices to include in their content. To boost your chances for successful media engagement at these conferences, consider preparing by:

- creating a media kit containing key information about your organization or your sessions (more information on media kit contents appears later in this chapter);
- organizing a press conference or media briefing to announce

- major advancements, unveil new research or initiatives, or provide updates on key developments;
- offering exclusive interviews with key speakers or experts participating in the event;
 - providing press passes or media credentials that grant access to activities and ensure that journalists have the necessary resources, such as Wi-Fi and power outlets, to file their stories;
 - creating your own networking opportunities such as coffee sessions, receptions, or press lounges where journalists can interact with speakers and other attendees, allowing informal conversations and relationship-building;
 - amplifying media coverage by relying on social media for real-time updates, behind-the-scenes photos, and live streams while encouraging attendees to use event-specific hashtags to join the conversation and follow the developments.

Media Tours and Workshops for Journalists

Media tours and workshops are immersive experiences offered to journalists and editors to help facilitate the understanding of science, research activities, and scientists' work. While they may not guarantee immediate media coverage, these are great ways to boost science comprehension and relationship-building with the media.

Interviews and Other Contributions from Scientific Sources to News and Media

Journalists are often looking for an expert voice on a topic they need to cover. They could be looking for an interview or might request a quote or comment on a specific topic or event. While they will often approach the organization's media contact, it is not unusual for scientists to be directly contacted by journalists, editors, and media professionals for their input. If you have a media expert in your organization, talk to this person and analyse the value of participating and keep in mind that it is also okay to pass on a media request. Science is about facts, and you will not always be the expert voice they are looking for on every topic. If you agree to contribute, check our section on interviews later in the chapter.



It's not unusual for journalists to lack science experience, sometimes resulting in them misunderstanding your contributions, or reporting on them inaccurately. Media professionals aim to provide their readers with truthful, valuable information; but, as humans, mistakes can happen. The best way to ask for corrections is to approach them politely and request an update, pointing out the inaccuracy with specific facts.

Developing Relationships with Journalists and Editors

Cultivating relationships based on mutual trust, respect, and transparency is the best way to aim for media coverage. Anyone interacting with the media, whether it's the specific media relations team or a research professional, should take the following tips into consideration:

- Be responsive to media enquiries. The news cycle moves very fast; therefore, providing timely confirmation of your involvement (or not) will be appreciated and possibly keep you in the loop as a good source when other opportunities arise.
- If you are not an expert on the topic they are covering, but you know who could be a good fit, direct them to this person or team. Think of your partnerships and network.
- Offer yourself or experts in your organization as reliable sources for interviews and commentary on the topics you research.
- Follow and interact with journalists covering the topics you research, or specialized media editors.
- Organize capacity-building activities for media, such as webinars or workshops, to provide insights that help journalists accurately report on complex scientific issues.
- Besides journalists and editors, collaborate and engage with professional communications networks such as the Forest Communicators Network and the International Environmental Communication Association.

The Essential Role of Social Media as Part of Your Media Strategy

Ensuring a strong and consistent presence in social media channels should be part of any compelling media engagement strategy, from connecting with journalists, assessing potential outlets for your stories, countering misinformation, and amplifying accurate information in real time. Social media has become a powerful tool for journalists and media sources to connect with audiences, gather information, and share news stories in real time. Social media platforms play a big role in news dissemination and consumption, and even control what news and information we see in our feeds.

Use social media wisely and it can become an ambassador for your research. Be sure that your presence on social media shows a clear brand identity. Choose the right platform for your desired audience's age, interest, and preferred interaction. The most popular platforms (e.g. TikTok) may not be the best for your goals and could distract resources from more effective channels. Develop a content strategy that outlines the types of content you will share, the tone, the frequency of posting, and the themes or topics you will cover. Lastly, monitor and analyse the performance of your posts to learn what works and whether you need to adapt your strategy.

Suggested reading: [How Social Media Has Changed How We Consume News](#)

- **5.04 billion people around the world now use social media (more than half of the world).**
- **The average time spent on social media each day is 2 hours 23 minutes.**
- **Around 94 per cent of journalists in the United States reported using social media for work in 2023.**

**Did
you
know?**

The Role of Generative AI

AI-powered tools such as ChatGPT are revolutionizing content creation, offering support in crafting pitches, stories, news articles, and blogs for media engagement with remarkable speed and, if well used, efficiency. They serve as powerful aids, particularly for bilingual professionals seeking to reach broader audiences beyond their native language. However, it's crucial to recognize that, while these tools can streamline the language aspect of media engagement, they cannot replace the importance of identifying the right approach for a story or the significance of cultivating genuine and trustworthy relationships with journalists and editors. Technology enhances our capabilities, but the human element remains essential in building rapport and credibility for media engagement efforts.

Suggested reading: [How Generative AI Is Changing Creative Work](#)

From Pitch to Publish: Tips to Get Media Coverage

Approaching the media effectively requires strategic and thoughtful steps to ensure that your message resonates with journalists and reaches the right audience. We recommend taking the following into account.

- Clearly define who your target audience is and the potential media partners and outlets you aim to reach. Do you want your story to reach the general public? Experts in the field? The academic world? Donors and partners?
- Make it news, not publicity. Pitch and develop a compelling story, angle, or press release that can capture the attention of journalists. What is the unique aspect of your story? How will this be of public interest? Make sure you don't fall into an 'advertorial' style (see below for more information about this).
- Have an updated media list on hand and identify priority media partners. Sometimes focusing on getting your story placed in one strategic outlet is more effective than broadcasting your story to a wider network. A single, influential outlet (e.g. *The*

New York Times) can lead to your story being reported on or picked up by many other sources.

- Create a concise and compelling pitch and get to the point. In today's world, the shorter the better.
- Consider these four questions when crafting your pitch or media release: a) What is the news? b) Why is it important? c) What evidence or data supports the story or argument? d) Can this be linked to current trends or alerts in the news?
- Follow up with journalists in a timely and respectful manner to gauge their interest and offer additional information or resources. Pay attention to their preferred communication method.
- Not everything you do will be of public interest or newsworthy. Be strategic when deciding what to pitch. Sometimes organizational news can do better in your own internal communication channels rather than needing to be pitched externally.
- Provide supporting materials such as a news media toolkit (see the next section for more details) to help enhance their understanding and coverage of your story.
- Be available to talk about the story. If a journalist expresses interest in covering your news, make yourself available for interviews or commentary. Is your story out? Well done! Now it's time to link to – or republish – on your own channels, post on social media, interact with the resulting audience, and monitor the results.

The term 'advertorial' comes from 'advertisement' and 'editorial'. It refers to a type of advertisement that is presented in the style of an editorial or news article, providing information about a product, service, or brand in a way that resembles journalistic content. Advertorials are a form of sponsored content, where the advertiser pays for the opportunity to promote their message within the editorial context of a publication.



News Media Toolkit

A news media toolkit, also known as press kit, is a collection of resources and materials that provide journalists, reporters, editors, bloggers, and other media professionals with essential information about an organization, event, result, study, milestone, or campaign. The purpose of a news media toolkit is to make it easy for media professionals to access relevant information that supports their coverage. News media toolkits are typically distributed to journalists, bloggers, and media outlets before or during major events or announcements, to facilitate media coverage and ensure accurate and comprehensive reporting. Nowadays, media toolkits are mostly distributed digitally and typically include:

- press releases or articles ready to be published or adapted for news publication;
- fact sheets about the topic containing statistics, background information, or other evidence about the subject, activity, or event being covered;
- profiles or bios of key individuals with expertise in the topic or the story you're pitching;
- professional-quality, free-for-use photos or graphics that can illustrate the story;
- a social media toolkit with suggested posts to promote the story, hashtags, calls to action, and visual resources (often these are organized and shared via Trello – see below for examples);
- contact information containing names, roles, email addresses, and phone numbers of media contacts or spokespeople who can provide additional information, set up interviews, or address media enquiries;
- background or institutional information about the organization.

Media kit sample: <https://events.globallandscapesforum.org/africa-2021/press-kit/>

Social media toolkit sample: <https://www.fao.org/international-day-of-forests/en/>

Did you know that there are media intelligence software services that can support your media engagement efforts? These are designed to help organizations stay informed about relevant news and conversations happening online to better understand their audience and include tools for media and social media monitoring, media analytics, and media engagement. Some of the most popular in today's arena are Meltwater, Cision, Talkwalker, and BrandWatch.

**Did
you
know?**

Handling Interviews

Very often, when interacting and engaging with media, scientists will be offered the opportunity to be interviewed. An interview can be the focus of the news or can serve to support or build the story. While the technical aspects vary depending on the specific format of the interview (e.g. in person, over the phone, via Zoom) and intended outlet (e.g. live television, radio or podcast, newspaper article), there are some essential considerations to prepare and deliver interviews successfully.

Preparation

The most important step to successfully delivering interviews and representing yourself and your organization positively is getting ready. For this, you should do the following.

- Know the format the interview will be conducted in. (Check below for tips on specific formats.)
- Know the media outlet and the interviewer. Check the outlet's audience (is it academic? Is it mostly youth? Is it a mainstream media outlet with a very broad audience?) and research the interviewer's profile, style, and tone.
- Tailor your messages to the outlet's audience. You could be a little more technical and detailed if the audience is one of experts, and more colloquial and simple if the audience is the general public.

- Ask the interviewer for the specific interview questions in advance or anticipate the types of questions you may be asked.
- Make sure you are up to date on the topic or subject matter being discussed. Gather relevant facts, statistics, and examples to support your key messages.

Interviews for Written Media

Interviews for written media such as newspapers, magazines, and blogs generally occur over email. While this may be a less intimidating interview format, because you can carefully review and refine your responses before sending them to the interviewer, you should note the following.

- Stay on-message. Focus on delivering your key ideas clearly and concisely as there is limited space and, often, a pre-defined length for stories in these outlets. Ask the interviewer the expected length of your contributions and stick to it. By providing focused, clear, and concise answers, you will reduce the likelihood of your important statements being shortened by the outlet's editors.
- Note that the headline and potential quotes will likely be written based on your responses. Try infusing your responses with captivating phrases to draw readers in and keep them engaged throughout the text.
- Include, or link to, a short bio that highlights your expertise on the topic and correctly states your name and affiliation.
- Ask the reporter if you can review a draft of the story for accuracy.

Interviews for Television

Television may be the most complex format to navigate, as time in TV is, literally, money. As a result, most published television news stories are relatively short, lasting a few minutes at most. The exceptions are longer-form thought pieces or documentaries. In this interview format, your visual cues and body language will make as much of an impact as your words – perhaps even more so. TV interviews can be broadcast live or recorded to be aired later. For television interviews, consider the following:

- Follow the production team's instructions for where to look during the interview. In general, plan to focus on the interviewer and maintain eye contact.
- Before you begin speaking, greet the interviewer and smile to establish rapport and set a positive tone for the interview.
- Mind your body language. Use gestures that complement the expression of your ideas, sit or stand upright, keep a relaxed and friendly face, and be mindful of your movements.
- Speak at a moderate pace. Avoid rushing your words in an attempt to cram more information into the interview. Focus on speaking clearly, using language that is easily understood and relatable to the audience.
- Consider what to wear and how your appearance will impact the perception of your persona.
- Find a way back to your key points to ensure your message remains prominent if the line of questioning veers away from your expectations. If prompted for a final thought, close with a key point that leaves a lasting impression.

If a live interview becomes difficult or confrontational, maintain your composure and voice tone. Stay on-message by reverting to your key points and sticking to your facts. Stay calm and positive as much as possible.



Interviews for Radio and Podcasts

In radio segments and podcast episodes, your words and tone are key. As with television, these interviews can be aired live or recorded. For a successful radio or podcast interview, consider the following tips:

- Familiarize yourself with the format, style, and audience of the radio show or podcast. Listen to previous episodes or segments to understand the tone and topics covered.
- Practise delivering your key messages succinctly and clearly and at a moderate pace. Use short sentences and brief examples.
- Keep your talking points in hand and check them whenever needed.

- Use vocal inflection, tone, and pacing to keep listeners engaged. Varying your voice can help convey emotion and emphasis on important points.
- Engage in a conversation with the host rather than delivering monologues. Make sure you actively listen, and respond thoughtfully to their questions.
- Visualize your audience. Imagine speaking to a specific person or group of people to help you connect with the audience on a more personal level.
- Keep your voice hydrated, especially for podcasts that are longer. Be sure to have water on hand, but don't sip during the interview or while being recorded.

Did you know?

- In 2023, there were 464 million podcast listeners worldwide, and a projected number of 504.9 million in 2024.
- The average podcast listener spends seven hours per week on their favourite podcast app.
- Episodes ranging from 20 to 40 minutes reign supreme, catering perfectly to busy schedules and shorter attention spans.

Interviews for 'Live' Social Media Channels

Happening mostly via YouTube, Instagram, or Facebook Live, these are spontaneous environments where you can interact with followers in real time. These interviews require you to join via your phone or laptop, meaning you will need to take technical considerations into account. Here are some tips:

- Test your technology in advance. Make sure you have a good internet connection, and your camera (either phone or laptop) is well placed. Ensure your microphone is working properly before the interview begins.
- Do your best to present yourself confidently on camera, with good lighting and a complementary background. Similar to a television interview, this is also a visual environment.
- Be professional and friendly and show your personality. Social media is about people.

- Dress appropriately, speak clearly, and stay focused on the interview topics.
- As with TV, keep the focus on the points you want to emphasize and the topic you want to discuss.
- Silence notifications and mute any devices in your background to avoid interruptions or disruptions while you are ‘live’.

Interviews via Video Conferencing Applications

Zoom, Teams, Meet, Webex and similar video conferencing applications are now part of our daily lives and allow us to connect and collaborate with people anywhere in the world. Interviews via these applications are increasingly common in the media environment.

- Verify if the interview will be recorded for broadcast or if it will serve as a conversation to explore a topic.
- Test the video conferencing software to familiarize yourself with its features and ensure a smooth experience.
- Ensure that your internet connection, camera, microphone, and lighting are all working properly before the interview.
- Check your frame and how you look. Don't sit too close, nor too far from your camera, which should be placed in front of you. Adjust location, lighting, and other details as necessary.
- Pay attention to your backdrop as this is what the interviewer or audience will see on camera. Consider using a neutral background or virtual background to minimize distractions.
- Inform household members or colleagues that you'll be in a meeting so you can prevent interruptions.
- Find a quiet, well-lit space for the interview where you won't be interrupted.
- Look directly into the camera when speaking to create the impression of eye contact with the interviewer.
- Close any unnecessary tabs or applications on your computer and silence notifications to minimize distractions.
- Pay attention to your body language, posture, and facial expressions during the interview. Sit up straight and nod occasionally to show engagement.



Today's fast-paced news cycle means that you may be asked for an immediate interview. If you're unable to adequately prepare, politely decline the offer and ask for a future opportunity to engage with the journalist.

Conclusion

Advances in technology have significantly changed how we consume news, bringing both challenges and opportunities for the media coverage of news from scientific organizations.

To remain visible to the media and to contribute expertise, organizations should strategically assess when and how to approach the media, selecting the right format for the right message and delivering it at the right time.

Building and nurturing relationships with media professionals remains essential - and while technology can help efficiently and quickly produce media products, the human element is still indispensable for successfully navigating the complex media relations environment.

More Useful Links

- [2023 Global State of the Media Report: The Vital Partnership of Journalists & Communicators to Navigate the Future by Cision](#)
- [Improving the Engagement of Scientists with the Media](#)
- [Journalism, Media, and Technology Trends and Predictions 2023](#)
- [Old Media, New Media, and Public Engagement With Science and Technology](#)
- [Reuters Digital Report 2023: Media Outlets Need to Adapt to new Generations](#)
- [Science Engagement and Social Media](#)
- [Supporting Scientists' Engagement with the Media](#)
- [World Press Trends Outlook 2023-2024 by the World Association of News Publishers](#)

STORYTELLING FOR EFFECTIVE SCIENTIFIC KEYNOTE PRESENTATIONS

Sara Santiago, Vitalie Gulca, Mercy Derkyi,
Giorgio Vacchiano

6
CHAPTER

Introduction to the Scientific Keynote Message

The keynote presentation serves as an anchor to a conference or gathering. This presentation provides the core theme for a conference and sets the stage for all the talks to come. It also convenes all attendees, regardless of their individual expertise, together. The keynote speaker is often chosen for their unique research expertise and ability to communicate core messaging and draw attention to, and excitement for, the key topic. Keynote presentations also offer the speaker the opportunity to present themselves, their organization, and their research in a compelling and personal way, which can be more effective than a written report (Schwartzkroin, 2009). These presentations also help the audience understand the world around us, which is especially important for urgent scientific issues.

Storytelling, therefore, becomes an important tool in the scientific keynote presentation. Through stories, the audience can become emotionally engaged, motivated, and empowered. This is where science can come to life. Creating a presentation with a narrative arc – the storytelling structure with a beginning, a middle with a struggle or tension, and an end with findings and conclusions – allows the science to resonate with the audience, especially if that audience is one of non-scientists. Stories help the audience to remember facts, create relationships, and be inspired to act. They are also engaging; the speaker can show, just not tell, and the audience will want to know the outcome (Paperpile, 2024).

The Power of Scientific Storytelling

Scientific storytelling not only connects the speaker to the audience – the scientist to the public – but also connects theory and practice. It explains why scientific findings are important and inspires action (Labster, 2024). “It can effectively convey knowledge to the research community, disseminate findings to lay audiences and help us clarify our own thinking about projects. To do good science is to create a good scientific story” (Bauman, 2023). Telling a story also holds the attention of the audience, which is, otherwise, likely to become distracted.

According to Chartier (2022), storytelling of scientific findings can:

- translate complex, sometimes abstract, scientific problems into simpler formats;
- catch and hold the interest of an intended audience;
- help people remember the information we share with them;
- make science accessible to the general public;
- get future generations excited about science at an early age.

Outlining the Presentation

According to Wong (2023), an informative presentation – which can be focused on education or research – gives the audience a clear understanding of a complex topic. It should have ‘clear structure, credible evidence, engaging delivery, and supporting visuals’.

Before creating the presentation slides, ask: what is the story you want to tell? The narrative should be defined first, then the presentation can be built around it. Not all the details of a scientific study should be included in the presentation, but a clear, scientific story will be more engaging and compelling (Schwartzkroin, 2009).

Knowing the audience is key to telling a relevant and engaging story and talk. Consider the audience's age, education, professions, beliefs, language, and cultures (DeCaro et al., 2002). Their interests, concerns, motivations, goals, challenges, and expectations can help guide appropriate hooks and calls to action.

From there, examples for organizing a talk on a single study and a talk on multiple studies are as follows (Paperpile, 2024):

SECTIONS IN A SINGLE STUDY TALK

- | | |
|----------------|--------------|
| • Introduction | • Summary |
| • Methods | • Conclusion |
| • Results | |

SECTIONS IN A TALK WITH MULTIPLE STUDIES

- Introduction — main idea behind all studies
- Methods of study 1
- Results of study 1
- Summary (take-home message) of study 1
- Transition to study 2 (can be a visual of your main idea that return to)
- Brief introduction for study 2
- Methods of study 2
- Results of study 2
- Summary of study 2
- Transition to study 3
- Repeat format until done
- Summary of all studies (return to your main idea)
- Conclusion

Each section should include the following:

- **Introduction:** sets the tone and begins the story. The introduction includes a broad perspective on the problem or topic, why it is important, why the audience should care, and what the audience will learn during the talk. This is the place for the hook (a fact, question, or anecdote).
- **Methods:** describes how the study was conducted. This section gives credibility to the study's results. There is no need to go into too much detail.
- **Results:** supports the original idea with evidence. There is no need to include all findings – include the ones that are most important and compelling for the audience.
- **Summary:** re-emphasizes important findings.
- **Conclusion:** returns to the hook and the big picture. This can also include a call to action or a conclusion to the tension of the middle of the story.

Designing and Delivering the Presentation

Next, apply the above outline into slides to create the visual component of a verbal talk.

Planning Presentation Slides

Each slide should contain one main idea. Do not clutter it with various ideas that will be difficult for the audience to follow. Then decide what are the best visuals to use to convey that idea, whether it is a table, chart, photo, or other data visualization. Bullet point notes should go under the slide for the speaker's reference.

The slide design should have a simple layout with high contrasting colours (e.g. black font against a white slide). Contrasting colours show differences in information and are also more legible. Slides should have informative titles and retain empty space, especially at the margins. Graphics need to be large enough so they can be easily read. Small details on graphs may be adjusted and explained. Photos can show work in action and visually tell the story (Paperpile, 2024).

Text should be legible and readable. Use sans serif fonts size 20 pt

and larger for bulleted text and 40 pt and up for titles. Citations can be small (14 pt) and should appear at the bottom of the slide. Avoid including several font sizes and emphasis throughout the presentation. Opt for bold and italics rather than underline or capitals (Paperpile, 2024).

All text should be concise – the speaker and the visuals should tell the full story. Text should be bulleted rather than in paragraph form. Any technical terms or jargon should be defined if the audience may not know their meanings. The goal is for everyone in the audience to be able to understand the talk. The take-home message should be summarized in one to two sentences.

Dos and Don'ts

The dos and don'ts of an effective scientific keynote presentation include (Wong, 2023; Paperpile, 2024):

DO:

- include data visualizations (charts, tables, graphs) to tell the story;
- avoid clutter on slides;
- retain white space and margins;
- choose compelling images;
- build slides around the speaker's main points;
- sequence the slides, information, and story logically;
- make the storyline easy to follow;
- include clear key takeaways;
- couple logical reasoning with emotional appeal;
- tailor content to the audience's interests and concerns;
- use anecdotes and metaphors to connect with the audience;
- include a call to action at the end.

DON'T:

- overload the slides with text;
- use excessive jargon and inaccessible language;
- jumble the structure;
- include low-quality, low-resolution visuals;
- add too much detail;

- use red-green and red-blue combinations (they cannot be distinguished by people who are colour-blind);
- include extra animations and transitions.

Practising Communicating

Beyond the physical appearance of the slides, tone, body language, and non-verbal communication are important to the presentation. Rehearsing and receiving feedback are crucial to delivering the scientific story.

Body language and non-verbal communication:

- Be relaxed.
- Match facial expression with the tone of the story.
- Make deliberate eye contact with individuals around the room. Avoid looking solely at your notes, the computer or projection screen, or randomly around the room.
- Face the audience with open body language.
- Move around if possible and when appropriate. Do not clutch the lectern.
- Talk with hands, but keep them at waist height.
- Match pitch, volume, and inflection with the tone, emotion, and authority of a topic.
- Consider incorporating humour, encouraging interaction, and showing enthusiasm.

However, it is important to remember that physical gestures and body language may vary by culture.

Finally, practice is of the utmost importance to make sure the presentation is within the allotted time. Pay attention to the flow of the presentation and make sure each idea and slide transitions to the next. First, practise alone, and then with a colleague who can give feedback. Practising with a colleague who is not an expert in the topic helps ensure that the presentation is accessible to a broader group.

References

- Bauman, J.R. (2023) Maximize your research impact with storytelling. *Nature Reviews Cancer* 23, 799. (Also available at <https://doi.org/10.1038/s41568-023-00616-z>, accessed 13 July 2024.)
- Chartier, M. (2022) Storytelling in science: why it matters and how to improve your skills. <https://fourwaves.com/blog/science-storytelling/#:-:text=When%20you%20know%20a%20lot,a%20topic%20into%20one%20story>, (accessed 13 July 2024).
- DeCaro, P., Adams, T., and Jefferis, B. (2022) Audience analysis. Chapter 5. <https://frontdoor.valenciacollege.edu/file/kholt12/Ch%205%20Audience.pdf>, (accessed 13 July 2024.)
- Labster. (nd). How can science teachers use storytelling? (Part 2). <https://www.labster.com/blog/how-science-teachers-can-use-storytelling/#:-:text=By%20building%20education%20through%20storytelling,to%20understand%20more%20complex%20information>, (accessed 13 July 2024).
- Paperpile.com. <https://paperpile.com/g/make-scientific-presentation/>, (accessed 13 July 2024).
- Schwartzkroin, P.A. (2009) *So you want to be a scientist?* Oxford University Press, Oxford.
- Wong, K. (2023) 8 types of presentations you should know [+examples & tips]. <https://venngage.com/blog/types-of-presentation/>, (accessed 13 July 2024.)

FOREST PSYCHOLOGY: EFFECTIVE WORDING AND FRAMING IN FOREST COMMUNICATION

Stefanie Steinebach

7
CHAPTER

Introduction

Why do we need emotions if we want to communicate forest science? Emotions and science don't mix. At least that's what most people think. Especially when it comes to the communication of scientific results and findings by scientists who consider 'objectivity' to be a central property of observables (Dettweiler, 2019), or at least to be the property of scientific methods that produce pure, rational, and unemotional facts. Scientific professionals are often at a loss as to how and why to engage with emotions in doing research and communicating their scientific findings. On the other hand, emotions themselves become a subject of investigation. Neuroscience and psychological science witness an ever-growing research interest and theoretical developments on emotion, addressing topics as diverse

(and important) as what emotions are, where they come from, how they are consciously experienced, and how they are implemented in the brain and body (Fox, 2018).

Revolutionary research in brain sciences has turned conventional views on the relationship between emotions, rationality, and beliefs upside down. It has been shown that rationality depends on emotion, and because cognition and emotion are almost indistinguishable in the brain, it can be assumed that emotions constitute and strengthen beliefs such as trust, nationalism, justice, or credibility (Mercer, 2010). Emotions relate to people's values, thinking and, thus, behaviour and even words and emotions seem to be interconnected in the brain (Satpute and Lindquist, 2021). The importance of emotions as essential components of effective strategic communication has been recognized by the media as well as by marketing and policy communicators. Evoking emotions in the audience is key to persuasion, as attitudes have a cognitive and emotive component, with predictable physiological outcomes that make messages more resonant and impactful on behaviour (Dennison, 2024).

Public and policymakers' opinion on forests is substantially influenced by the media landscape, including social media, that presents forest-related information emotionally and within certain frames and contexts (Mack et. al., 2023). Consequently, forest science communicators increasingly ask themselves how to effectively address their audiences and how to give captivating lectures and presentations to attract attention to their scientific results (see Chapter 6: Storytelling for Effective Scientific Keynote Presentations). To gain people's attention, scientists employ emotional communicative strategies from the field of marketing psychology such as storytelling, where information is united with an emotion to ignite the fire in people so that they burn for an idea and its implementation.

From an academic viewpoint, emotionalized science communication is often regarded as trivial and met with scepticism (Taddicken and Reif, 2020). There are concerns that more emotional communicative approaches might not be based on facts and undermine the neutrality and thereby the credibility of science.

As Portelli-Ward (Chapter 2 in this manual) points out, the overall intention in communicating information and forest science is about building trust and maybe even confidence in the audience – be it other scientists, academia, policymakers, or the public receiving the messages. This is particularly important as today’s world is characterized by ambiguity, change, diversity, poly-contextuality, and social divisions that are emerging along new fault lines of truth and post-truth.

Building trust and confidence is an emotional process as trust is an emotional bond and “trust [is] from the heart, a bond that arises from one’s own emotions and sense of the other’s feelings ...” (Lee, 2023). In this process, communication plays a key role in building trust and relationships (Intemann, 2023). Hence, emotions play a central role in forest science communication in at least two ways that are influencing each other:

There has to be trust in the forest scientist’s integrity and capacity as a provider of information. Expectations regarding the intentions and credibility of the trust provider are of great importance in forest science communication.

The way of communicating science and scientific results must evoke emotions and stimulate resonance in the audiences to generate attention and passion about scientific forest issues without losing scientific credibility.

In the discussion if the rational position of science and the presentation of abstract results can or should be abandoned in favour of more emotional narratives, there is relatively little guidance about how emotions should be used in forest-related communication. Therefore, some central aspects are addressed in this chapter:

- Emotions and how they work: how emotions influence thoughts and human behaviour.
- Emotions, values, and forests: how emotions relate to forests and influence forest management.
- Strategic use of emotions in forest communication: how emotions relate to communication and how they affect the outcome of communication.

- Framing – what it means and how it works: how language and wording influence the audience’s trust in scientific information.
- How to do framing: how to set a frame and to choose the ‘right’ wording.
- Building trust in forest communicators: how you can become a trustworthy source of information, fostering trust and credibility.

Take-home message: To build trust and credibility, we should relearn and embrace our own emotionality as a scientist, which expresses our motivation and passion for forests and research. In short, we should become emotional experts who are capable of expressing our own values and emotions in relation to the topic of our communication – thus the love and passion for the forests and forestry!

Emotions, Thoughts, and How They Work

To better understand the role of emotions in communication and how to manage emotions in successful communication, it is helpful to reflect briefly on ourselves: We readily accept that it is our emotional connections to the people whom we love and care about that make us human. We feel joy and pain in equal measure with our friends, and even reach out to connect to the lives and well-being of people we have never met (Spikins, 2022). Emotions are at the core of our relationships with others, and we have an inherent reward system to foster positive social interactions (Wise and Rompre, 1989; Manninen et al., 2017).

Emotions are expressed both verbally – through words – and non-verbally, through facial expressions, voices, gestures, body postures, and movements. We are constantly expressing emotions when interacting with others, and others can reliably judge those emotional expressions (Elfenbein and Ambady, 2002). Emotions serve as a source of information, providing insights into the situation, our safety, and our perception of others (Manninen et al., 2017).

Emotions are our physical reactions to stimuli in the outside environment. They can be objectively measured by blood flow, brain activity, and non-verbal reactions to things because they are

activated through neurotransmitters and hormones released by the brain.

Emotions play a crucial role in forming connections, making decisions, and mobilizing us towards action. Emotions are initially elicited rapidly and can trigger swift action. Emotions are not necessarily a form of heuristic thought, but once activated, some emotions (e.g. sadness) can trigger more systematic thought. Distinguishing between the cognitive consequences of an emotion-elicitation phase and an emotion-persistence phase may be useful in linking emotion to modes of thought (Lerner, 2015).

Emotions are inherently related with feelings that mediate thoughts, language, and behaviour. Feelings are the conscious experience of emotional reactions. They are our responses to thoughts and interpretations given to emotions based on experiences, memory, expectations, and personality (Šimić, 2021; Spikins, 2022). Emotions and feelings are present in human relations and in relations to more-than-human (i.e. nature and especially forests). In the scientific literature, human connections to nature are often depicted with the concepts of human–environment and human–nature relationships (Schultz, 2002). Again, emotions play a key role in how people relate to their environments as places providing different resources. Besides material meanings, people also connect intangible meanings to their environment.

When the resources or the meanings are threatened, people react emotionally (Buijs and Lawrence, 2013). In psychology, these emotions are often subsumed under the heading ‘moral emotions’ (Tangney et al., 2007). Moral emotions provide the motivational force

TIPS:

Observe yourself. In what situations do you get emotional or even passionate? Be honest about it.

Reflect on yourself. When are emotions at the base of action?

Pay attention to how your thoughts about situations and people relate to your feelings.

Have you ever tried to influence your feelings with your thoughts? How did it work?

-the power and energy - to do good and to avoid doing bad. Moral emotions include empathy and sympathy for other living beings and are closely related to feelings of concern for distressed others (e.g. trees and animals). Such empathic concern often initiates 'righteous' anger as well as helping behaviour. The energizing power of such feelings of anger has led collective action researchers to describe emotions as the conceptual bridge between cognitive appraisals of a situation and the tendency to organize and stand up against such behaviour (Van Zomeren et al., 2008).

Emotions, Values, and Forests

Emotions and, especially, moral emotions that lead us into action are fundamentally connected to values. Emotions and values are psychological markers of subjective relevance and are thought to be deeply functionally intertwined. Values can be regarded as motivational constructs that specify abstract goals guiding people's actions across contexts and time (Rokeach, 1973; Schwartz, 1992). Values relate to our identity and indicate normative standards that exert a normative (controlling) influence on human behaviour (Schwartz, 1992; Twight, 1983). Values help us to decide what is right and wrong and how to act in various situations. It is people's concept of values that guides their perceptions and judgements of behaviours, people, or cultures and underlies their self-regulation of political and moral action. Values exert a powerful force on social and political decisions, moral judgements, and self-regulation, and people get along far better when they share the same values (Malle, 2004).

According to appraisal theories of emotion, emotions arise when value concerns are at stake; according to theories of value, a value that is threatened or supported gets infused with feelings (Conte, 2023). Also, sociological thought explicitly links emotions to both values and cognitions. Emotions are interpreted as "intelligent responses to perceptions of value and, as such, part of the system of ethical reasoning" (Nussbaum, 2001).

It could be shown that values are, indeed, antecedents of emotions when emotional experiences arise in response to value-relevant stimuli. Individual differences in biospheric values predicted the

intensity of emotional responses towards positive and negative information concerning nature and climate change (Conte, 2023).

A relational approach to values indicates that relations between humans and nature extend beyond instrumental values. Emotions connect people to both the physical forest environment and its cultural representations all over the world, as studies from sociology and cultural anthropology point out. This is illustrated by examples from Germany and Indonesia:

The German term ‘waldeinsamkeit’ is a compound of the word ‘forest’ (‘wald’) and ‘solitude/loneliness’ (‘einsamkeit’) and is said to represent the soul and deeper psyche of Germany. Waldeinsamkeit cannot really be explained, but refers to the feeling one has while being alone in the woods – usually a sublime or spiritual one. Widely known German writers and scholars such as Johann Wolfgang von Goethe, Herman Hesse, Victor von Scheffel, and Martin Heidegger embraced the practice of forest loneliness as a cure for stress that has evolved into a symbol of German identity. “Waldeinsamkeit” is also the subject of paintings in various epochs, such as Caspar David Friedrich (romanticism) and Eduard Leonhardi (naturalism).¹

The ethnic identity of the Indonesian forest-dwelling people Orang

TIPS:

Reflect and identify your personal values that guide your actions in daily life (respect, honesty, for example). Collect three to five personal values most important to you – you will need them later when developing your profile as trustworthy forest communicator. Identify your forest-related cultural values: what meaning do forests and trees have in your culture?

Identify your forest-related personal values: what meaning do forests and trees have for you? What emotions and feelings do they evoke in you (respect, awe, usefulness, ...)? Collect three to five values and/or emotions.

1 ‘Waldeinsamkeit’ is a quintessentially untranslatable German word but the idea and motive of this kind of forest experience can be found in other cultural contexts and epochs all over the world. To name the enlightened, sublime feeling that can come from being alone in the woods (MacEacheran, 2021) the word Waldeinsamkeit is used all over the world.

Rimba (literally ‘people of the jungle’) is inextricably linked to the forest. The forest is not only a resource and livelihood, but trees are essential to Orang Rimba’s personal existence. Each individual maintains a sacred bond with a certain tree from birth for the rest of their life. This tree is the human individuals’ alter ego and must be protected from any harm as damage on the tree directly impacts the human’s health. To the Orang Rimba, felling or damaging a birth tree is equivalent to murder.

TIPS:

Find out as much as possible about the forest-related values of your audience. Listen carefully to how others relate to forests and appreciate it. Ask questions about people’s attachment to the forest.

Show your own emotional attachment to forests to enhance the relationship with your audience.

Do not hold scientific objectivity higher than your audiences’ forest-related values and attitudes.

Culture-specific human-forest relationships can occur at the individual level in the form of individual identity, or at a collective level such as cultural identity (Steinebach, 2012), social responsibility, and moral responsibility to non-humans (Roux et al., 2022). Such relations are shown in people’s motivations in managing forests, which range from maintaining multiple forest resources to maintaining local identity (including sacred forests) and their overall sense of place relative to the natural world (Berkes et al., 2000; Steinebach, 2017). The strong sense of partnership with

forests and nature-inclusive eudaimonia in turn represents a two-way relational value that can inform, catalyse, and sustain conservation actions (Yuliani, 2022). But these intangible values are hard to measure (i.e. rationalize), to govern (i.e. institutionalize), and to price (i.e. monetize). These difficulties may explain why forest scientists, experts, and policymakers have been cautious to address intangible or even spiritual values explicitly (Roux et al., 2022). These different kinds of values people attach to forests are highly emotional, and therefore heavily impact the relationship level with other people: if we share the same values and emotional attachments to forests, it is easy to build an interpersonal relationship. On the other hand,

collision of values is a major source of forest-related conflicts. To foster relations rather than provoke conflicts, forest communicators should try to understand their audiences' forest-related values.

Strategic Use of Emotions in Forest Communication

How are emotions and values related to communication about forests? Communication is commonly understood as the transmission of information between a sender – here, the forest scientist, and a receiver – the audience, or various stakeholders or target groups of forest science communication.

Several communication models give differentiated explanations on the various forms and levels of communication and complexity of the communication process itself. To deal with the role of emotions in the process of forest science communication, it is helpful to draw on the so-called iceberg model, which is a metaphor rather than a real model.² It illustrates the levels of interpersonal communication, which can be differentiated in factual and relationship levels. With an iceberg, only 20 per cent is visible above the surface of the water. This visible part symbolizes the factual level of communication that contains conscious – i.e. visible – and analysable statements, such as facts, figures, and data as well as observable behaviour (what people do and how they react).

The major, 80 per cent of the iceberg is hidden beneath the surface of the water. This invisible part of the iceberg represents the relationship layer and comprises often unconscious or not directly observable or explicitly mentioned aspects, such as needs, beliefs, interests, and values as described in the section above. All aspects closely relate to emotions and are highly individual. We unconsciously filter and

2 The term was first used as a metaphor by Ernest Hemingway. He said that it was not necessary to give all the details about the main character, but, like an iceberg, only 1/8 of the iceberg, the part above the water's surface. In the German-speaking world, the term 'iceberg model' was first used in 1974 by Ruch / Zimbardo in reference to Freud's structural model of the psyche of id, ego, and superego. The id and parts of the ego represent the unconscious part of the personality, the rest is conscious.

evaluate the things we hear and see according to our own subjective 'emotional mindset' of values, needs, and interests. Individuals usually determine whether or not to endorse a statement based on their values (Wildavsky, 1987). The determinant of which emotion a person feels is a complex combination of one's current circumstances and feelings, the nature of the stimuli, and a person's deep-seated values, narratives, worldview, and 'self' (Dennison, 2024). Hence, one concept can have different meanings for different people as each one of us creates our own version of what we observe and experience. This version then colours our relationships with other humans and non-human entities such as forests. To successfully manage communication at the relationship level, understanding your target group is much more about the values, attitudes, and needs of target groups than about demographic characteristics (see section above). The importance of the relationship level in communication is also directly reflected in the term 'public relations' itself. As the name suggests, public relations is about building relations and, thus, mediating emotions. Consequently, successful forest science communication must take emotions into account.

Framing – What it Means and How it Works

Communication usually has a specific intention that is related to an appeal. The appeal, or wish, contains what the sender wants the receiver to do or think. According to the four-sides model of communication³ by psychologist Schulz von Thun (1983), whoever states something will also affect something. This appeal-message should make the receiver do something or leave something undone. The attempt to influence someone can be open or hidden. With the 'appeal ear', the receiver asks themselves, "What should I do, think, or feel now?"

Here, the concept of framing becomes relevant as words and emotions seem to be interconnected in the brain. In the social sciences, the framing approach functions as a theoretical perspective

³ According to this model, every message has four facets though not the same emphasis might be put on each. The four sides of the message are fact, self-disclosure, social relationship between sender and receiver, and wish or appeal.

on how people perceive reality and construct it through their communication. According to Chong and Druckman (2007) the main assumption of the framing approach is that an issue can be viewed from a variety of perspectives and be construed as having implications for multiple values or considerations. Framing effects are enabled by underlying cognitive processes; some studies suggest that framing effects may also be mediated by emotional response (Lecheler et al., 2013). In this context, emotions are not simply produced by specific situations, but shape our reasoning, our framing of the situation, and our responses to it. Consequently, emotion and cognition co-produce beliefs (Head, 2012) as brain regions are involved in the semantic processing of words (Satpute and Lindquist, 2021). Every time we have an emotional experience, the neural regions that process the semantics of words also get involved. Words can evoke strong emotional responses in the listener. This is detectable in our brains. Reactivity in the amygdala, which plays a key role in processing emotional stimuli and reactions, decreases when someone labels negative emotional images.

Negative emotions also induce neurotransmitter release during processing of negative emotional words (Badgaiyan et al., 2009). For example, when people give words to negative emotions, they regulate their emotional state and calm themselves down. The cognitive elements are not the trigger of feelings, but a component of them and the basis on which feelings can be individuated. Accordingly, positive emotions are triggered by a positive situational evaluation, negative emotions regarding personal values, goals, desires, etc. (Senge, 2013). Whereas happiness rewards us, sadness punishes us, and fear and anger elicit stress (Dennison, 2024).

More complex governing abilities of emotions include the discomfort we might feel when undergoing cognitive dissonance – when we come to believe two contrary things – which, in the ideal case, force us to reconcile our attitudes, beliefs, and so on, often in a painful process of ‘facing up to the facts’; however, our emotions will not let us rest until we do (Harmon-Jones, 2000). In fact, this discomfort has been argued to be one of the major sources of persuasion and attitudinal change – our emotional system forcing us to realize that

our old beliefs were wrong so that we better survive and thrive in an ever-changing world (Dennison, 2024). Moreover, negative and positive emotional communication has been linked with loss- and gain-based frames, respectively. For example, ‘stopping forest management threatens timber supply’ versus ‘forest management ensures timber supply’. Gain-based frames have been argued to be more effective than loss-based frames as they are more likely to contradict deeply held world beliefs and values (Feinberg and

Willer, 2011). Emotions mediate the relationship between frames and attitudinal or behavioural effects in controversial social issues (Lecheler et al., 2013).

The concept of ‘framing’ has multiple meanings, as it serves not only as a description of communicative constructs, but also of the thought structures of

individuals. Kinder and Sanders (1996) refer to this as a kind of ‘double existence’. So-called heuristic frames (the invisible part of the iceberg – values, beliefs, etc.) are inherent in every person’s thinking, and superficial communication frames existing in the outside world that convey a certain content between communicators and recipients. Even though these concepts are two completely different entities, they are closely related for strategic framing.

While heuristic frames are part of a generally involuntary interpretation mechanism, the content of communication frames can be deliberately constructed (Druckman, 2011). These frames of how to interpret the world should comport with the receiver’s belief and reference systems to create resonance and acceptance within the audience’s everyday experiences (Entman, 2003). Hence, strategic framing considers the heuristic frames of the receiver in the construction of the communication frame to precisely convey the intended message to shape the interpretation of a situation, promote a particular causal understanding, or action guiding moral evaluation – this means the communicative appeal.

TIPS:

Pay attention to use of loss- or gain-based frames in media communication.

Reflect on what kind of frame better fits your communicational goal.

How to Frame

Communication frames are always formed using a similar structure. Communicators first diagnose a problem in a frame, which they usually embed in a specific context. Depending on the context and emphasis, this results in versions of the discussed facts, which can be used to create a specific perception and a desired interpretation. In this way, a new form of reality can emerge for recipients with one-sided information (Entman, 1993; Lakoff, 2006; Polletta, 1998). Furthermore, communicators offer an assessment of the situation and prescribe a certain 'cure', which is usually formulated as a proposed solution. Entman (1993) therefore divides frames into four analytical content categories:

1. problem definition
2. cause or causal interpretation
3. moral evaluation
4. suggestions of certain possible solutions or instructions for action.

Not every frame has to serve all factors. If at least two of these elements are present in a message, this already constitutes subset framing (Entman, 1993). Frames do not even necessarily have to have an internal logical coherence (Entman, 2003). Accordingly, dialectically formulated frames can achieve effects just as well as one-sided interpretative frames.

Benford and Snow (2000) developed a very similar approach by differentiating diagnostic, prognostic, and motivational framing. Diagnostic framing identifies sources of a problem by attributing blame or responsibility to specific causes or causal actors, and sets boundaries for the framing of what should be interpreted as good and evil. Further prognostic framing, in contrast, refers to proposed solutions, whereas motivational framing relates to the perceived urgency of the problem and the call for agency (Benford and Snow, 2000).

An example of a problem being interpreted and discussed in different frames is the relation between climate change and forests as well

as forest management.⁴ In the public and scientific debates and discourses in Europe, forests are presented as the main affected parties as well as the most important factor in solving the crisis in terms of their climate mitigation potential.

1. Problem definition: damage to forest ecosystems triggered by climate change.
2. Cause: climate conditions in combination with pests.
3. Moral evaluation? Judgement? – the forest as a victim in need of support as well as the forest as a saviour in a crisis.
4. Solution: active forest management, including planting of non-native tree species and forest management.

In the discourse of a nature conservationist, the forest is also a victim. The solution and the call for action is to refrain from forestry activities and leave forests alone because, in their view, forests can better recover without human intervention.

1. Problem definition: damage in forest ecosystems triggered by climate change, climate conditions in combination to pests.
2. Cause: climate conditions in combination with pests and forestry interventions.
3. Moral evaluation: the forest as a saviour that is threatened by forestry.
4. Solution: reduce forestry activities and leave the forest to its own healing powers.

Another example for positive and negative emotions related to language and words is the way of picturing the relationship between individual trees in a forest ecosystem, and the implications for forest management/silviculture:

In classical forestry theory, competition is a key factor driving forest dynamics and stand structure. Competition for light (and water) is defined as an individual-to-individual antagonistic interaction that, if severe, can constrain the presence of trees within a particular environment. Competition from neighbouring trees generally has

4 Framing of climate change has been investigated by different scholars (e.g. Hoffmann, 2011; Stecula, 2019).

a negative effect on the growth of an individual tree; however, the magnitude of competition is expected to vary with size and proximity of the tree and its competitors.

Here the terms are *competition*, *antagonism among individuals*, *negative effect*, which many people may associate with stress, and which tend to trigger negative emotions. The idea of separated individuals perfectly supports the idea of selective forest management systems focusing on single trees and timber production.

In contrast to this classical forestry theory, more holistic and system-oriented framing approaches⁵ understand forests as highly interconnected places, where the vitality of trees depends on the strength and coordination of their physical relationships with other trees and organisms. Here, forests and plants are not simply understood as individuals competing, but as existing in sophisticated, complex relationships with their neighbours. Forests are described as multifaceted, involving competition, collaboration, cooperation, and communication.

In this frame, rather positive emotions are evoked by words such as *sophisticated*, *collaboration*, *connection*, and *relationship*. Silvicultural consequence then would be a more holistic approach that does not focus on promoting individual trees as a source of wood, but rather on managing the forest ecosystem.

A message contains frames, which are manifested by the presence or absence of certain keywords, stock phrases, stereotyped images,

TIPS:

Ask yourself, what is the intent and the appeal in your communication? Do you want to evoke certain feelings, thoughts, or behaviour in your audience?

Analyse and thoughtfully choose your wording with respect to their emotional affiliation. What kind of emotions are triggered?

Analyse and adjust the framing of your information – is it rather loss- or gain-based?

⁵ Communicators of this framing are many Indigenous Peoples but also Emanuele Coccia (*Metamorphoses*) or Suzanne Simard (*Finding the Mother Tree*).

sources of information, and sentences that provide thematically reinforcing clusters of facts or judgements. Both examples of forest framing above use wordings that are related to positive or negative emotions and are related to values that either honour competition and dominance, or relationship and collaboration. The frames that guide the receiver's thinking and conclusion may or may not reflect the frames in the message and the framing intention of the communicator (Entman, 1993). Language plays a crucial role since it both represents and forms the categories and concepts that transform content-weak sensations into content-rich emotions (Frevort and Pahl, 2022). Drawing on the Plutchik's (1980) 'wheel of emotions', as derived from his 'A General Psychoevolutionary Theory of Basic Emotions', Dennison (2024) identifies certain emotions to trigger distinct behavioural outcomes in the audience.

- Trust is likely to most strongly enhance persuasive campaigns to seek to increase support for groups or individuals.
- Joy is likely to be an effective emotion to motivate participation because it leads to connection.
- Anticipation triggers examination and is likely to best support efforts to raise awareness.

When you choose emotionally charged words, you can create a more profound connection with your audience. Different frames create different versions of the discussed facts and consequently different versions of the reality for the receivers.

Building Trust in Forest Communicators

This last section is about the forest scientist's integrity and capacity as provider of trustworthy information. To deal with scientific information, laypeople must trust in scientists/communicators and their findings (Hendriks et al., 2016). As already discussed in the sections above, building trustworthy relationships with the audience is at the heart of every successful communication. The relationship level makes up for 80 per cent in communication and is inseparably interwoven with emotions. With this, we are back to the starting point of this chapter, explaining that there is a tension between emotion and rationality in science, which results from the methodological

principle of objectivity. Science should be individual-independent and scientific knowledge based on well-organized, professional work experience, education, and academic forest research – not on emotions or irrationality.

But naturally, scientists themselves are confronted with emotions during the research process – as are science communicators (including science-communicating scientists) during the communication process. The mismatch between claimed rational objectivity and absence of emotions and the human emotional subjectivity of the scientist may be based on role expectations. These role expectations are linked to concepts of appropriate attitudes, behaviours, or feelings, for a scientific expert and originate in institutions (e.g. universities, research institutions, and the discipline of science itself). Institutions can thus be conceived of as organizational arrangements that connect roles/identities, accounts of situations, resources, and prescriptive rules and practices (Sandhu, 2012). Institutions create actors and meeting places, and organize the relations and interactions among actors. They guide behaviour and stabilize expectations. Specific institutional settings also provide vocabularies and terminologies that frame thought and understanding and define legitimate arguments and standards of justification and criticism.

Apart from providing cognitive frames and maps of meaning, (academic) institutions offer emotional modes that are shared among their members and aligned with organizational goals. They create a ‘logic of appropriateness’. This includes the appropriateness of emotions: which emotions are deemed adequate and in what way should they be navigated and expressed? (Olsen and March, 2004.) These are ideas of how a ‘proper’ scientist or expert has to be is rooted in academic institutions that provide guidelines for their members on how to feel and navigate emotions, and teach them which to express and which to avoid, at what intensity, and through what kinds of behaviour. They offer suggestions for when and where certain emotions, but not others, should be addressed and performed. Institutions thus enable, invite, incentivize, channel, control, or prohibit emotional practices – that is, they develop

templates for emotions. However, a science that does not permit emotions seems to be culturally distant or even contradictory to the emotionalized everyday lives that audiences experience. Having these stereotypes of science and scientists in mind, the question arises as to what happens when scientific experts are not objective but openly express emotional reactions in the public discourse?

Becoming an Emotional Expert

Trust is a so-called emotional belief; how people feel influences their interpretation of another's behaviour. An emotional belief is defined as *one where emotion constitutes and strengthens a belief and which makes possible a generalization about an actor that involves certainty beyond evidence* (Mercer, 2010). Yet such emotional beliefs are not objective and immutable, and neither is trust (Head, 2012). Among others, trust is defined as the willingness for a person to make themselves vulnerable to the actions of another party (Maye et al., 2007). This vulnerability demonstrates that trust is always based on emotion rather than logical evaluation (Aljazzaf et al., 2010) and (as cited in the introduction) that trust is an emotional bond that arises from a person's own emotions and sense of the other's feelings (Lee, 2023). An indispensable skill needed to build trust with others is empathy (Spikins, 2022), or the ability to imagine what someone else might be thinking or feeling at any given moment. Findings suggest that both incidental and integral emotions can influence decisions to trust. Specifically, positive incidental emotions, such as happiness, can enhance trust while negative incidental emotions, such as anxiety, reduce trust (Farolfi, 2021).

In the field of science, the goods that the trustee provides to the trustor is *knowledge*. And the risk for the trustor is that they are vulnerable to a lack of truth or validity of that knowledge (Hendriks et al., 2016). Therefore, expectations about a forest communicator's intentions are highly relevant in science communication. Science is both a social and a cognitive entity. Science as a social entity refers to the people who produce scientific insights (i.e. they 'do the science') and to the organizations they work for. Science as a cognitive entity refers to the ever-evolving body of knowledge

that results from practising science. As an immediate consequence of its dual entity, it is inevitable that the assumed trustworthiness of science also depends on how the public appreciates and views the knowledge claims produced by science.

An expert is considered trustworthy if they offer advice or positive applications for the trustor or (more generally) for the good of society (Whyte and Crease, 2010); that is, they must act with benevolence. Furthermore, when a layperson considers trusting an expert, a person's propensity to trust can be equally assumed. In childhood, but also during professional education, we learn whether it is appropriate to express emotions in certain social settings, which feelings are appropriate, and how feelings should be expressed.

To build trust and credibility, we should relearn and embrace our own emotionality as a scientist, which expresses our motivation and passion for forests and research. In short, we should become emotional experts who are capable of expressing our own values and emotions in relation to the topic of our communication – thus the love and passion for the forests and forestry!

TIPS:

Identify your own motivation for forest research and communication and relate it to emotions and values. Ask yourself: Why are forests and trees so important to me that I invest time and energy?

Reach for the hearts of your audience by expressing your own emotions.

Try to understand humans (brain – neuroscience) as well as forests.

Take emotions seriously as scientific hard facts.

Check your communication for emotional triggers.

Find your own style of emotional communication of fact-based scientific results.

References

- Aljazzaf, Z.M., Perry, M., and Capretz, M.A. (2010) Online trust: definition and principles. Paper presented at The *Fifth International Multi-conference on Computing in the Global Information Technology*, Valencia, Spain, 20–25 September 2010. doi: 10.1109/ICCGI.2010.17
- Badgaiyan, R.D., Fischman, A.J., and Alpert, N.M. (2009) Dopamine release during human emotional processing. *Neuroimage*, 47(4), 2041–2045. doi: 10.1016/j.neuroimage.2009.06.008
- Benford, R., and Snow, D. (2000) Framing processes and social movements: an overview and assessment. *Annual Review of Sociology* 26: 611–639. (Also available at <https://www.jstor.org/stable/223459>, accessed 17 July 2024.)
- Berkes, F., Colding, J., and Folke, C. (2000) Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications* 10(5): 1251–1262. doi: 10.1890/1051-0761(2000)010[1251:ROTEKA]2.0.CO;2
- Buijs, A., and Lawrence, A. (2013) Emotional conflicts in rational forestry: towards a research agenda for understanding emotions in environmental conflicts. *Forest Policy and Economics* 33: 104–111. doi: 10.1016/j.forpol.2012.09.002
- Coccia, E. (2021) *Metamorphosen: Das Leben hat viele Formen. Eine Philosophie der Verwandlung*. Carl Hanser Verlag GmbH Co KG.
- Conte, B., Hahnel, U.J.J., and Brosch, T. (2023) From values to emotions: cognitive appraisal mediates the impact of core values on emotional experience. *Emotion* 23(4): 1115–1129. doi: 10.1037/emo0001083
- Chong, D., and Druckman, J.N. (2007) Framing theory. *Annual Review of Political Science* 10(1): 103–126. doi: 10.1146/annurev.polisci.10.072805.103054
- Dennison, J. (2024) Emotions: functions and significance for attitudes, behaviour, and communication. *Migration Studies* 12(1): 1–20. doi: 10.1093/migration/mnad018
- Dettweiler, U. (2019) The rationality of science and the inevitability of defining prior beliefs in empirical research. *Frontiers in Psychology* 10: 1866. doi: 10.3389/fpsyg.2019.01866

- Druckman, J.N. (2011) What's it all about? Framing in political science. In: Keren, G. (ed) *Perspectives on Framing*, 1st ed. pp. 282–296. Society for Judgment and Decision Making. Psychology Press, Hove, UK.
- Elfenbein, H.A., and Ambady, N. (2002) On the universality and cultural specificity of emotion recognition: a meta-analysis. *Psychological Bulletin* 128(2): 203–235. doi: 10.1037/0033-2909.128.2.203
- Entman, R.M. (1993) Framing: toward clarification of a fractured paradigm. *Journal of Communication* 43(4): 51–58. doi: 10.1111/j.1460-2466.1993.tb01304.x
- Entman, R.M. (2003) Cascading activation: contesting the White House's frame after 9/11. *Political Communication* 20(4): 415–432. doi: 10.1080/10584600390244176
- Farolfi, F., Chang, L-A., and Engelmann, J.B. (2021) Trust and emotion: the effects of incidental and integral affect. In: Krueger F., (ed) *The Neurobiology of Trust*, pp. 124–154. Cambridge University Press, Cambridge, UK.
- Feinberg, M., and Willer, R. (2011) Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. *Psychological Science* 22(1): 34–38. doi: 10.1177/0956797610391911
- Fox, M.D. (2018) Mapping symptoms to brain networks with the human connectome. *The New England Journal of Medicine* 379: 2237–2245. doi: 10.1056/NEJMr1706158
- Frevert, U., Pahl, K.M., Buscemi, F., Nielson, P., Arndt, A., Amico, M., Lichau, K., Malone, H., Wambach, J., Brauer, J., and Moine, C. (2022) *Feeling Political: Emotions and Institutions Since 1789*. Springer Nature, Cham, Switzerland.
- Harmon-Jones, C., Bastian, B. and Harmon-Jones, E. (2000) A cognitive dissonance theory perspective on the role of emotion in the maintenance and change of beliefs and attitudes. In: Frijda, N., Manstead, A., and Bem, S. (eds) *Emotions and Beliefs: How Feelings Influence Thoughts (Studies in Emotion and Social Interaction)*, pp. 185–211. Cambridge University Press, Cambridge, UK.

- Head, N. (2012) Transforming conflict: trust, empathy, and dialogue. *International Journal of Peace Studies* 17(2): 33–55. Also available at <https://www.jstor.org/stable/41853034>, accessed 16 July 2024.
- Hendriks, F., Kienhues, D., and Bromme, R. (2016) Trust in science and the science of trust. In: B. Blöbaum (ed) *Trust and Communication in a Digitized World: Models and Concepts of Trust Research*, pp. 143–159. Springer, Switzerland.
- Hoffman, A.J. (2011) Talking past each other? Cultural framing of skeptical and convinced logics in the climate change debate. *Organization & Environment* 24(1): 3–33. doi: 10.2139/ssrn.1768882
- Intemann, K. (2023) Science communication and public trust in science. *Interdisciplinary Science Reviews* 48(2): 350–365. doi: 10.1080/03080188.2022.215224
- Kinder, D.R., and Sanders, L.M. (1996) *Divided by Color: Racial Politics and Democratic Ideals*. University of Chicago Press, Chicago.
- Lakoff, G. (2006) The framing of immigration. <https://escholarship.org/uc/item/Oj89f85g>, accessed 16 July 2024.
- Lee, J.I., Dirks, K.T., and Campagna, R.L. (2023) At the heart of trust: understanding the integral relationship between emotion and trust. *Group & Organization Management* 48(2): 546–580.
- Lecheler, S., Schuck, A.R., and De Vreese, C.H. (2013) Dealing with feelings: positive and negative discrete emotions as mediators of news framing effects. *Communications* 38(2): 189–209. doi: 10.1515/commun-2013-0011
- Lerner, J., Ye L., Piercarlo V., and Karim S.K. (2015) Emotion and decision making. *Annual Review of Psychology* 66: 799–823. doi: 10.1146/annurev-psych-010213-115043
- Manninen, S., Tuominen, L., Dunbar, R.I., Karjalainen, T., Hirvonen, J., Arponen, E., Hari, R., Jääskeläinen, I.P., Sams, M., and Nummenmaa, L. (2017) Social laughter triggers endogenous opioid release in humans. *The Journal of Neuroscience* 37(25): 6125–6131. doi: 10.1523/JNEUROSCI.0688-16.2017
- MacEacheran, M. (2021) Waldeinsamkeit: Germany’s cherished forest tradition. BBC. <https://www.bbc.com/travel/article/20210314-waldeinsamkeit-germanys-cherished-forest-tradition> (accessed 16 July 2024)

- Mack, P., Kremer, J., and Kleinschmit, D. (2023) Forest dieback reframed and revisited? Forests (re)negotiated in the German media between forestry and nature conservation. *Forest Policy and Economics* 147(2023): 102883. doi: 10.1016/j.forpol.2022.102883
- Malle, B.F. (2004) *How the Mind Explains Behavior: Folk Explanations, Meaning, and Social Interaction*. MIT Press, Cambridge, USA.
- Mercer, J. (2010) Emotional beliefs. *International Organization* 64(1): 1–31. doi: 10.1017/S0020818309990221
- Nussbaum, M. (2001) *Upheavals of Thought: The Intelligence of Emotions*. Cambridge University Press, Cambridge, UK.
- Olsen, J.P., and March, J.G. (2004) The logic of appropriateness. ARENA, ARENA Working Papers. 9. doi: 10.1093/oxfordhb/9780199548453.003.0034
- Peters, B. (1997) On public deliberation and public culture: reflections on the public sphere. (Working Paper) InIIS-Arbeitspapier, 7/97, Bremen. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-67149-4>
- Plutchik, R. (1980) A general psychoevolutionary theory of emotion. In: Campeggiani, P. (ed) *Theories of Emotion: Expressing, Feeling, Acting*. pp. 3–33. Academic Press, Cambridge, USA.
- Polletta, F. (1998) Contending stories: narrative in social movements. *Qualitative Sociology* 21: 419–446. doi: 10.1023/A:1023332410633
- Rokeach, M. (1973) *The Nature of Human Values*. Free Press, New York.
- Roux, J.-L., Konczal, A.A., Bernasconi, A., Bhagwat, S.A., De Vreese, R., Doimo, I., Marini Govigli, V., Kašpar, J., Kohsaka, R., Pettenella, D., Plieninger, T., Shakeri, Z., Shibata, S., Stara, K., Takahashi, T., Torralba, M., Tyrväinen, L., Weiss, G., and Winkel, G. (2022) Exploring evolving spiritual values of forests in Europe and Asia: a transition hypothesis toward re-spiritualizing forests. *Ecology and Society* 27(4). doi: 10.5751/ES-13509-270420
- Ruch, F.L., Zimbardo, P.G., Brengelmann, J.C., Angermeier, W.F., Gert, W., Ortlieb, S., Ramin, G., Schips, R., Schulmerich, C., Brengelmeier, J.C., and Thiekötter, T.J. (1975) *Lehrbuch der Psychologie. Eine Einführung für Studenten der Psychologie, Medizin und Pädagogik*. 2. Aufl., Springer, Berlin Heidelberg.

- Sandhu, S. (2012) *Public Relations und Legitimität: Der Beitrag des organisationalen Neo-Institutionalismus für die PR-Forschung*. Springer-Verlag, Wiesbaden, Germany.
- Satpute, A.B., and Lindquist, K.A. (2021) At the neural intersection between language and emotion. *Affective Science* 2(2): 207-220. doi: 10.1007/s42761-021-00032-2
- Schoorman, F.D., Mayer, R.C., and Davis, J.H. (2007) An integrative model of organizational trust: past, present, and future. *Academy of Management Review* 32(2): 344-354. doi: 10.2307/20159304
- Schultz, P.W. (2002) Inclusion with nature: the psychology of human-nature relations. In: Schmuck, P., Schultz, W.P. (eds) *Psychology of Sustainable Development*. Springer, Boston, USA.
- Schulz von Thun, F. (1983) *Miteinander reden 1: Störungen und Klärungen: Allgemeine Psychologie der Kommunikation*. Psychologie der zwischenmenschlichen Kommunikation. Miteinander reden. Rowohlt Taschenbuch Verlag, Reinbeck, Hamburg.
- Schwartz, S.H. (1992) Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In: M. Zanna (ed) *Advances in Experimental Social Psychology* 25, pp. 1-65. Academic Press, Cambridge, USA.
- Senge, K., and Schützeichel, R. (2013) *Hauptwerke der Emotionssoziologie*. Springer VS, Wiesbaden, Germany.
- Simard, S. (2021) *Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest*. Penguin, London.
- Šimić, G., Tkalčić, M., Vukić, V., Mulc, D., Španić, E., Šagud, M., Olucha-Bordonau, F.E., Vukšić, M.R., and Hof, P.R. (2021) Understanding emotions: origins and roles of the Amygdala. *Biomolecules* 11(6): 823. doi: 10.3390/biom11060823
- Spikins, P. (2022) *Hidden Depths: The Origins of Human Connection*. White Rose University Press, York, UK.
- Stecula, D., and Merkley, E. (2019) Framing climate change: economics, ideology, and uncertainty in American news media content from 1988 to 2014. *Frontiers in Communication* 4: 6. doi: 10.3389/fcomm.2019.00006
- Steinebach, S. (2012) *Der Regenwald ist unser Haus: Die Orang Rimba auf Sumatra zwischen Autonomie und Fremdbestimmung*. (Thesis) Universitätsverlag Göttingen, Göttingen.

- Steinebach, S. (2017) Farmers and pawns: the role of migrants in agrarian conflicts and rural resistance in Sumatra, Indonesia. *The Asia Pacific Journal of Anthropology* 18(3): 228–245. doi: 10.1080/14442213.2017.1304443
- Taddicken, M., and Reif, A. (2020) Between evidence and emotions: emotional appeals in science communication. *Media and Communication* 8(1): 101–106. doi: 10.17645/mac.v8i1.2934
- Tangney, J., Stuewig, J., and Mashek, D. (2007) Moral emotions and moral behaviour. *Annual Review of Psychology* 58: 345–372. doi: 10.1146/annurev.psych.56.091103.070145
- Twight, B.W. (1983) *Organizational Values and Political Power: The Forest Service Versus the Olympic National Park*. The Pennsylvania State University Press, Philadelphia, PA.
- Van Zomeren, M., Postmes, T., and Spears, R. (2008) Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin* 134: 504–535. doi: 10.1037/0033-2909.134.4.504
- Whyte, K.P., and Crease, R.P. (2010) Trust, expertise, and the philosophy of science. *Synthese* 177: 411–425. doi: 10.1007/s11229-010-9786-3
- Wildavsky, A. (1987) Choosing preferences by constructing institutions: a cultural theory of preference formation. *American Political Science Review* 81(1): 3–21. doi: 10.2307/1960776
- Wise, R.A., and Rompre, P.P. (1989) Brain dopamine and reward. *Annual Review of Psychology* 40: 191–225. doi: 10.1146/annurev.ps.40.020189.001203
- Yuliani, E.L., Moeliono, M., Labarani, A., Fisher, M.R., Tias, P.A., and Sunderland, T. (2022) Relational values of forests: value-conflicts between local communities and external programmes in Sulawesi. *People and Nature* 5: 1822–1838. doi: 10.1002/pan3.10389

CASE STUDIES

Coordinated and Edited by Cathy Watson,
CIFOR-ICRAF

8

CHAPTER

Times have changed immeasurably since the 2014 edition of 'Communicating Forestry Science'. What were called success stories in that edition are case studies in this one. With the climate crisis and biodiversity loss felt every day, circumspection about what constitutes success is much higher now than it was a decade ago. We need to do much more of the right thing everywhere. Very few indicators are going in the right direction.

That is not to say, however, that this chapter does not document any successes. The certification of Sardinia's cork forests, documented by Ilaria Dalla Vecchia and Alberto Pauletto of Forest Stewardship Council Italy and the phenomenal scaling of 'Tree Equity' in US cities and beyond, described here by Jad Daley of American Forests, are resoundingly good news.

This chapter reflects today's world – so different from 2014 – in other ways.

- RECOFTC's study from Thailand describes the use of an app to raise funds for stewardship of planted trees. Crowdfunding was in its infancy in 2014, and stewardship of trees a faint discourse since forest landscape restoration had yet to explode.
- IUFRO's case study by Jose Bolaños describes step by step how podcasts can disseminate and popularize forestry science. Podcasts only really took off in 2018 after a riveting US crime series brought in millions of listeners.
- The United Nations Environment Programme (UNEP)'s case study is also startlingly contemporary, describing how a knowledge, attitude, and practice survey helped hone its communications on forest crime. Social norms in Myanmar, Cambodia, and Lao PDR emerged as more tolerant of illegality than in China and Thailand. "Explaining the importance of safeguarding indigenous trees is fundamental to forest science communication in the context of forest crime" said author Katrina Borromeo.
- And all studies stressed the importance of social media. "Virtuality is an ally," said CATIE's Marianela Argüello on communicating the forest science of Payments for Ecosystem Services in Costa Rica.

Repeated lessons learned included 'use true and personal stories' and 'bite-sized information'; have a 'relatable tone', and collaborate with others and nurture alliances. 'Keep going and do not give up' was another theme. This chapter provides inspired reading from organizations communicating the frontline – from the forests of Italy, to the urban forests of New Jersey city Newark, to Goriški Kras forest, which experienced the largest fire in Slovenia's history.

Like its 2014 predecessor, this edition favours diversity. Its nine case studies originated from Europe (3), Africa (1), Asia (2), Latin America (1) North America (1) and Global (1). It also uses a similar format.

Good reading,

Cathy Watson

CASE STUDY 1: COMMUNICATING ABOUT PAYMENTS FOR ENVIRONMENTAL SERVICES: THE CASE OF COSTA RICA

Marianela Argüello Leiva,
Communication and Knowledge Management,
UEAAS/EfD, CATIE

Period: 2007–Present

Problem: How to highlight the importance of research on environmental economic instruments, such as Payments for Ecosystem Services (PES) in Costa Rica, to other researchers, higher education students, and decision makers.

Communication instruments used: personal communication, meetings, web articles, social media publications on different platforms and in two languages, stands at functions, and showcasing the results of research papers at international events.

Evidence of success: Continuity over the years in the development of research aimed at better understanding economic mechanisms such as payments for environmental services has paid off, as has persistence in communication actions as per the available budget and through different international entities. Other reasons for success

have been the planning of communication actions for each research effort and the consolidation of the credibility of studies carried out under principles of responsibility and professional ethics. The latter has allowed for a relationship with national and local government institutions responsible for PES.

THE CASE STUDY

For decades, Costa Rica has been recognized as dedicated to forest protection and, more broadly, environmental conservation. For its efforts to sustain ecosystems for the benefit of people and nature, this Central American state has been widely cited as an example of global excellence. Bold actions on PES have been executed by successive governments, the private sector, and myriad NGOs and projects.

A significant event within this process, especially related to forests, occurred on 16 April 1996, when Forest Law No 7575 was enacted, bringing about payments for environmental services for the first time (Sánchez-Chávez and Navarrete-Chacón, 2017). The same law also set up the National Forestry Financing Fund (Fondo Nacional de Financiamiento Forestal - FONAFIFO) as the entity responsible for the PES programme in the country.

PES began to be implemented in 1997 in Costa Rica as a financial mechanism, primarily to promote the conservation of the country's forest resources. However, its implementation generated other benefits for nature while at the same time combatting rural poverty (Ortíz-Malavasi, 2004). According to the Global Green Growth Institute (GGGI), PES in Costa Rica is globally acknowledged to be a model of innovative economic and regulatory instruments that the international community would do well to learn from. Additionally, international frameworks such as the Paris Agreement recognize that valuing and investing in forests and environmental services is critically relevant within the world's new climate regime (GGGI, 2016).

Given the significance of PES, specialized researchers in environmental economics from the Tropical Agricultural Research and Higher Education Center (CATIE) in Turrialba, Costa Rica, have

worked since 2007 to make environmental economic instruments a high priority on the research agenda. This research team at the Environmental Economics and Sustainable Agribusiness Research Unit (UEAAS/EfD) of CATIE is additionally part of the Environment for Development (EfD) initiative in the centre located in Central America (EfD Central America). EfD is a global network of research centres solving pressing global environmental and development challenges, and contributing to the effective management of the environment in the Global South through policy-relevant research, capacity development, and policy engagement (EfD, 2024).

Through this strategic alliance focused on research in environmental economics, projects on PES and other environmental economics topics have been facilitated, and researchers have endeavoured to better understand PES as an economic instrument aimed at forest conservation as well as its impact on other ecosystem services provided by nature. In important ways, this research responds to the needs of decision makers in government entities responsible for PES.

Research, consultations, and other work on PES has been conducted, primarily in Costa Rica, but also in Guatemala, Honduras, Nicaragua, and Jamaica. For each study, depending on funds, cooperation has been established with counterparts interested in PES in governments, municipal authorities, multilateral organizations. These include the Inter-American Development Bank (IADB), the Food and Agricultural Organization of the United Nations (FAO), the United Nations Development Programme and the World Bank, and donors such as the Tinker Foundation and Swedish International Development Cooperation Agency. This experience has led to research cooperation agreements on PES with the National Institute of Forest Science of the Republic of South Korea, among others.

Communicating forest science has been important to these efforts. Press releases or briefs are timed to go out with scientific journal articles or technical reports put out by institutions such as CATIE, IADB, and ministries. Therefore, annual strategic communication planning is not set in stone, but flexible to respond when communication is needed.

While the timing may be flexible, the UEAAS/EfD research unit at CATIE does build an individual strategic communication plan for each of the technical or scientific products that are officially published. This requires coordination and approval from counterparts or entities that have funded or requested the work, not only to coordinate communication efforts to reach a wider audience, but also so that it goes out with the appropriate endorsement.

On the other hand, since the topic of PES has been one of the most consistent and continuous since 2007, the most recently implemented communication tactics will be used as an example, mostly during the first quarter of 2024.

The most recent research on PES in Costa Rica was initiated in 2022 in coordination with FONAFIFO. The topic was understanding the impact of the PES programme on water resources. The efforts around this research provide a good example of communicating the forest science. During 2022 and 2023, communication actions implemented were:

- meetings with authorities and key actors related to PES;
- training to strengthen the capacities of the staff of FONAFIFO in the use of a modelling tool that improves the allocation of funds to maximize water resources and update the knowledge on water dynamics related to farms, forests, and landscapes;
- publication of web notes in English on EfD's page and in Spanish on CATIE's web;
- posting information in Spanish on CATIE's social media platforms, including Facebook, Instagram, and LinkedIn;
- posting information in English on EfD's social media platforms, including Facebook, X (before Twitter), and LinkedIn;
- sharing information through participation and a booth at the VIII Wallace Scientific Conference: Transforming Food Systems in Latin America and the Caribbean in May 2023; information was also shared when deputies from the Legislative Assembly of Costa Rica visited CATIE in August 2023.

Communication activities continued in 2024 with the publication of the study 'Alternatives for improving Payment for Ecosystem Services (PES) Effectiveness on Water Resources' (Viguera, 2024)

in the Journal of Soil and Water Conservation. Some of the activities planned were:

- participation of researchers in the 18th North American Agroforestry Conference to share the findings;
- writing web notes in English for the EfD Website and in Spanish for CATIE;
- publication in Spanish on CATIE's social media platforms, including X (formerly Twitter), Facebook, Instagram, and LinkedIn;
- publications on EfD Central America's social media platforms in both English and Spanish, on Facebook and LinkedIn;
- distribution of notes through EfD's monthly newsletter (in English), which reaches audiences in Asia, Africa, Latin America, and Europe;
- distribution of notes through CATIE's weekly email news bulletin which reaches readers mainly in Latin America;
- printing and placing news on the information board located at the main building of CATIE which has many visitors including international ones;
- sharing information with members of the Forest and Environmental Communicators Network for Latin America and the Caribbean (Red de Comunicadores Forestales y Ambientales de América Latina y el Caribe - Recofalc) through WhatsApp.

All these have contributed to disseminating the findings of the study and work carried out, and promoted discussion on the effectiveness of PES.

LESSONS LEARNED

- Communication approaches such as press releases, newsletters highlighting stories, and seminars inviting guests, do well in framing in PES and can be recommended.
- Among the important audiences are decision makers from institutions responsible for PES, researchers, and university students in environmental economics.
- Think about who is the communicator best suited for different audiences. Both the person in charge of communicating the topic

and the researchers play key roles. Think about the most suitable professional to communicate with different target groups.

- Nurture alliances. In our case, the platform of CATIE allows us to reach thousands of people from different countries in Latin America and the Caribbean, while hosting the Efd Central America centre allows us to send our message to other parts of the world such as countries in Europe, Africa, and Asia.
- Do not allow challenges to hinder communication. Many organizations face economic limitations. Reasons vary, but it is clear that aid and funding entities are prioritizing other parts of the world, leaving less for research or extension in Latin American countries such as Costa Rica. Communicators have less and less to allocate to their plans. This limits communication tactics that can be executed. However, the lesson is that while lack of funding may be an impediment, it can be an opportunity to become more strategic and focused on viable action.
- Virtuality is now an ally that opens up many options to easily share information and reach hundreds of people from many places.
- The challenge is not to stop communicating because everything needed is not readily available, but rather to use creatively what is available and find spaces to promote messages to our audiences.

References

- Efd (2024). About Efd. <https://www.efdinitiative.org/about-efd/about-us> (accessed 16 July 2024).
- GGGI (2016) *Bridging the Policy and Investment Gap for Payment for Ecosystem Services: Learning from the Costa Rican Experience and Roads Ahead*. (Report). <https://gggi.org/report/bridging-the-policy-and-investment-gap-for-payment-for-ecosystem-services-learning-from-the-costa-rican-experience-and-roads-ahead/> (accessed 16 June 2024.)
- Ortiz-Malavasi, E. (2004) Efectividad del Programa de Pago de Servicios Ambientales por Protección del Bosque (PSA-Protección) como instrumento para mejorar la calidad de vida de los propietarios de bosques en zonas rurales. *Kurú: Revista*

Forestal (Costa Rica), 1(2), 1-11. (Also available at <https://revistas.tec.ac.cr/index.php/kuru/article/view/569>, accessed 16 July 2024.)

Sánchez-Chávez, O., Navarrete-Chacón, G. (2017). La experiencia de Costa Rica en el pago por servicios ambientales: 20 años de lecciones aprendidas. *Revista de Ciencias Ambientales Tropical Journal of Environmental Science* 51(2): 195–214. doi: [10.15359/rca.51-2.11](https://doi.org/10.15359/rca.51-2.11)

Viguera, B., Madrigal-Ballester, R., Pacay, E., and Navarrete-Chacón, G. (2024) Alternatives for improving payment for ecosystem services (PES) effectiveness on water resources. *Journal of Soil and Water Conservation*, 79(1), 5A–9A. doi: [10.2489/jswc.2024.1103a](https://doi.org/10.2489/jswc.2024.1103a)

CASE STUDY 2: COMMUNICATING THE SCIENCE AROUND THE CERTIFICATION OF SUSTAINABLE CORK FROM THE MANAGEMENT OF *QUERCUS SP.* FORESTS IN SARDINIA

Ilaria Dalla Vecchia and Alberto Pauletto,
Forest Stewardship Council, Italy

Period: 2005–2024

Problem: Despite 11 million ha of forests covering one-third of its land mass, Italy has lost the culture of forest management. The result has been the abandonment of large areas of forest that once strongly contributed to the sustenance of communities. Forest Stewardship Council® (FSC®) certification of Sardinian cork forests represents an example of redemption and stands as a way to communicate the importance of responsible forest management.

Communication instruments used: websites, workshops, posters, press tours, conference sessions, and collaboration with other local and national organizations.

Evidence of success: Intense media attention around the Cusseddu-Miali-Parapinta cork plantation, its certification and management; successful training of forest technicians and managers in the area;

at least three private forestry enterprises emulating the Cussedu-Miali-Parapinta model, so more attention being paid to the supply chain of sustainable and FSC-certified cork products.

THE CASE STUDY

This case study starts with a momentous achievement by Agris Sardegna, the office in charge of research in cork cultivation and forestry (*Servizio della Ricerca per la Sughericoltura e la Silvicoltura*) for the Italian region of Sardinia. With a mission to promote sustainable development and protect and enhance biodiversity, in 2005 Agris Sardegna's 66 ha of cork forests obtained Forest Stewardship Council (FSC) certification.

FSC is a non-governmental, non-profit organization that promotes the responsible management of forests and plantations. Its certification of the cork forest in Sardinia owned by Agris Sardegna was obtained as part of a pilot project with Worldwide Fund for Nature (WWF). WWF extolled the certification with a congratulatory and informative piece on its [website](#) in 2005.

“Cork oak forests represent one of the best examples of the harmonious interaction between people and nature in the Mediterranean where almost the entire world production of cork is found,” WWF explained. “Hundreds of thousands of people earn their livelihood from the cork forests, while supporting nature. Not a single tree is cut to harvest the cork as the bark is stripped every 9-12 years. Cork ecosystems are also characterized by high levels of endemism, with plant species reaching up to 135 species per 0.1 ha. These forests host endangered species [such as] the Iberian imperial eagle or the Barbary deer.”

In 2020, this cork oak forest also obtained, for the first time in the world, FSC certification of the five ecosystem services. These are biodiversity conservation, carbon sequestration and storage, water services, soil conservation and recreational services, and the Millennium Ecosystem Assessment (2005) that defines ecosystem services generally as ‘the multiple benefits provided by natural ecosystems to humanity’.

This was a landmark moment in which communication of forest science played a key role before, during, and afterwards. It was essential to communicate to different audiences why certification is important, how it works, and why cork forests are vital for ecosystem services and local economies. FSC Italy, the national representative of the international certification scheme, has been the biggest promoter of this initiative, keeping up a stream of information about certification and the importance of forest management.

“The Cusseddu-Miali-Parapinta cork forest in the municipality of Tempio Pausania (SS) is largely populated by cork oak (*Quercus suber* L.) mixed with downy oak (*Quercus pubescens* Willd),” explained FSC Italy in one post on its website. “Management is aimed at the naturalistic enhancement of the forest, and silvicultural interventions are aimed at converting the forest from even to uneven-aged, at preventing fires and enhancing the cork oak forest ecological values.”

Readers are challenged to understand the science of why uneven-aged multi-species forests are better. The answer is that recreating the patterns of a natural forest has benefits, for example, in the case of strong winds and storms: the tallest and oldest trees will act as a cover protecting those below. This and other benefits such as the greater drought tolerance of multi-aged, multi-species forests are hugely important as climate change and its effects are having devastating consequences on communities and natural resources. These learnings come from forest science.

Environment, people, and market were key topics important to the broad audience that FSC sought to communicate with, starting from local producers who have preserved the knowledge for managing cork oaks, although they have an increasingly smaller market outlet. The community was also important, especially in the Gallura area, which has maintained the traditions linked to the use of cork. No less important is the messaging to decision makers who, through the case of Agris Sardegna, can now promote replicable models of environmental and economic sustainability. Finally, the general public was an important part of the audience; they are largely unfamiliar with the potential of (national) cork supply chain.

To reach these audiences, FSC Italy deployed posters and workshops as communication tools. At one workshop in Nuoro in November 2019, Dr Pino Angelo Ruiu, Head of the Cork and Forestry Sector of Agris Sardegna, presented a poster showing how certification can confer advantages in the cork market, while at the same time help resolve excessive fragmentation of land ownership thanks to group certification. FSC offers a particular type of certification that allows small owners to unite under a single certificate, benefiting from lower management costs.

FSC Italy then created a series of informational and promotional materials such as guides and factsheets for forest managers, along with a calendar of training courses for managers and technicians in the forestry sector.

Moreover, every year FSC Italy organizes a press tour of one of the forests certified to its standards. Today in Italy such forests cover almost 90,000 ha. The tour is a way to concretely demonstrate to journalists – and readers – how certification works and what benefits can bring to the environment, economy, and community. It is also a way for forest managers to make their work known and promote their commitment. The 2021 press tour saw the participation of five journalists, and the publication of several articles and insights pieces in major national newspapers.

Good progress, including the use of these multiple communication approaches, went on steadily, and FSC certification was renewed in 2010, 2015, and 2020.

The example of Agris Sardegna and the Cusseddu-Miali-Parapinta cork grove has moved other owners to invest in the certification of forest areas and in the verification of ecosystem services. This is the case of the Baldu cork grove owned by the Molinas Group company, those in Luogosanto, and the property of Masala Antonio in Villanova Monteleone. More recently (2023), the municipality of Alà dei Sardi also decided to certify its forestry heritage according to FSC standards, becoming the first municipality in Italy to do so. Finally, the case of Agris Sardegna's cork demonstrated that sustainable management in favour of environmental and economic

factors is not only possible, but also desirable: as of now this cork forest produces, every ten years, approximately 1,600 quintals of cork, which are then sold to FSC-certified companies for processing.

LESSONS LEARNED

- The main communication challenge concerns forest active management: in Italy, many people and the media see forests as areas in which humans should not operate, and which should be left to evolve freely.
- Concrete cases such as that of the cork grove managed by Agris Sardegna have allowed a wide audience to understand how conservation activities and sustainable use of resources can coexist. Despite this, some of the general public remains convinced that forests and trees should be left untouched.
- Sustainable management of forest areas and the conservation and improvement of natural services are fundamental tools for land management and adaptation to climate change. However, this model must be adapted from time to time, according to contextual needs.
- A global perspective is useful. In this case, FSC International was able to connect the Italian cork experience with the experience of Brazilian and Indonesian forest managers.
- Communication actions include information and promotion: information and promotion actions must include forestry managers and technicians.
- True stories and real success stories are those that generally have the greatest success among the audience, because they bring the audience closer to problems that feel familiar and urgent.
- It is important to collaborate with other organizations and take all opportunities to present at congresses. In this case, collaboration with the Italian Society of Silviculture and Forest Ecology (Società Italiana di Selvicoltura ed Ecologia Forestale - SISEF) and presenting at its [XIII Congress](#) in 2022 constituted an important communication channel.

Additional resources

- [Ad Alà dei Sardi \(SS\) una tre giorni sulle opportunità legate alla sughericoltura](#)
- [FSC Italia al Southern European Regional Meeting \(SERM\) di IFSA](#)
- [L'Association Forêt Méditerranéenne in visita alla sughereta sperimentale certificata FSC](#)
- [Si radica in Sardegna la filiera del sughero sostenibile](#)
- [Sughereta sperimentale di Agris Sardegna: un modello di gestione sostenibile](#)
- [Sughero, certificazione ed economia circolare all'evento della Rete INFEAS](#)

For more information, contact:

- Pino Angelo Ruiu, Giuseppino Pira, Salvatore Seddaiu, Roberto Zurru of the Agris Sardegna Cork and Forestry Research Service;
- Maria Sitzia and Gian Marco Marrosu at the Agris Sardegna Research Service for Zootechnics;
- Ilaria Dalla Vecchia – FSC Italy;
- Maria Rita Gallozzi – Freelance – Lead auditor, FSC.

CASE STUDY 3: FORESTRY COMMUNICATION APPROACHES DURING THE LARGEST FOREST FIRE IN SLOVENIA

Boris Rantaša,
Slovenian Forestry Institute

Period: July 2022 – present

Problem: The Goriški Kras forest fire was the largest fire in Slovenia's history, damaging nearly 3,000 ha of forests and involving over 20,000 individuals in firefighting and post-fire restoration. The forestry sector's response during the fire and to after-fire restoration required cooperative, timely, and persistent communication with a wide array of stakeholders.

Communication instruments used: Media briefings, press conferences and press releases, forestry and cultural events and workshops, media and stakeholder partnerships and platforms, social media and email calls to action, and pathways for involvement of volunteers and gathering donations.

Evidence of success:

- Timely and accurate daily information to the media and public was provided during the forest fire, with good practices in internal and external communication.
- Approximately 500 volunteer forestry workers contributed to fire breaks and emergency clear-cuts during the crucial stage of firefighting.
- Key forestry and forest science personnel appeared in news broadcast and science programmes; over 200 media publications in one month, over 500 in a year.
- The 'Together for Karst!' fundraising partnership was established, raising over €300,000 in donations.
- A post-fire restoration plan was approved with stakeholder participation, featuring a communication strategy.
- About 40,000 seedlings and several tonnes of forest seed were planted by over 4,000 volunteers during volunteer post-fire restoration efforts.

THE CASE STUDY

The Goriški Kras forest fire was the largest in Slovenia's history, damaging a total of 3,707 ha of which 2,902 ha (78 per cent) was forest. The fire occurred during extremely dry and hot weather, and a very high fire risk to the natural environment was declared before and during the fire by the Slovenian Environmental Agency. The cause of the individual fire hotspots is unknown, apart from one caused by a train. It took place in south-western Slovenia with additional areas in Italy, and lasted from 15 to 29 July 2022. Due to the relatively large scale of the fire and its duration, over 20,000 people from various services, most of them professional and volunteer firefighters from all regions of Slovenia, but also members of the Slovenian armed forces, were involved in firefighting and post-fire restoration activities.



Figure 1. The Goriški Kras forest fire damaged nearly 3,000 ha.



Figure 2. Due to extreme heat, the fire quickly spread (jumped) to faraway areas.

Forestry engineers, lumberjacks, and forestry machine operators were also key contributors in the short- and long-term fire response. Forestry operations included orientation assistance, terrain expertise, provision of detailed maps of forest roads and trails, and coordination and execution of emergency logging services to create firebreaks and emergency clear-cuts around roads and villages.

The size and severity of the fire and challenges of tackling and suppressing it captured the attention of the public. Media enquiries and questions became overwhelming and required a coordinated response. Public and media relations quickly became urgently needed. To serve both the public and the media sufficiently, an impromptu emergency public relations framework was set up. This was coordinated by the Slovenia Forest Service, and supported by the Slovenian State Forests (SiDG), the Ministry of Agriculture, Forestry and Food, and the Slovenian Forestry Institute in the different stages of the communication process. The operation was coordinated from the forest fire response emergency headquarters (HQ), which was set up in Kostanjevica na Krasi.



Figure 3. The forestry sector played an important role in the initial and long-term forest fire response.



Figure 4. **The forestry sector provided coordination, local expertise, and maps to firefighters and other services.**

In the earliest public communications regarding the forest fire, the Slovenia Forest Service provided input and information to the civil protection service. From 21 to 24 July 2022, the days of the quickest fire spread and most intense response activities, the Slovenia Forest Service prepared and sent out daily press releases. These provided the public with information about:

- the extent and spread of the fire;
- ongoing activities to fight it, such as emergency harvesting and clear cutting, forest road expansion, including the description of ongoing works and the number of forestry workers, machines, etc. present in the area;
- information for local inhabitants about ongoing evacuations;
- information about how to volunteer, calls for volunteers, gathering points, information about when volunteers were not needed anymore, thank you messages;
- first estimates of material damage and damages to biodiversity.

Forestry officials regularly presented the facts and instructions about the forest fire response in the most relevant radio and TV news broadcasts. More than 200 publications featuring the representatives of the forestry sector appeared in the media during and after the forest fire. During the intervention to quell the fire, foresters and forestry workers were featured in the most important programmes and features, such as national radio and TV news broadcasts, front pages of online portals and newspapers, and prime-time evening TV news programmes. The leadership of forestry service's forest fire response was visited by and briefed the Prime Minister, Defence Minister, the Commander of the Civil Protection Service, and the President of the Republic of Slovenia, among other important state actors.



Figure 5. Field press conference at the fire response headquarters.



Figure 6. **Appearance on a national TV news broadcast.**

On the afternoon of 22 July, forest fire response teams and HQ were facing a catastrophic spread of the fire, which was threatening to consume several villages, necessitating the evacuation of the local population. Professional forestry and forest road teams that were already in place were insufficient to create the necessary firebreaks and emergency clear-cuts in time to protect the health and property of the local inhabitants.

A call for lumberjacks, forest machinery operators, and other forest workers to volunteer was disseminated through Slovenian State Forests social media channels. It received over 2,000 likes and several hundred shares on Facebook and other social media. The response exceeded all expectations: by the morning of 23 July 23, over 300 volunteer lumberjacks had gathered at the designated point. In the days that followed, the volunteers critically contributed to the fire response and significantly raised capacities to create emergency firebreaks and clear-cuts. In total, 494 volunteer foresters were registered as a part of the forest fire response effort in addition to professional forestry workers from Slovenian State Forests and 18 smaller private forestry companies.



Figure 7. **Over 300 volunteer forestry workers responded to the emergency call on social media.**



Figure 8. **Professional subcontractors provided an important force for forest fire response.**

Along with many volunteers who wanted to control and contain the fire, a great number of further volunteers and organizations wanted to help with fire mitigation and restoration by providing donations, initially by providing food and equipment to the firefighters and forestry workers, and later by donating funds and labour to restoration.

The interest was overwhelming and exceeded the expectations and capacities of both the local communities and the Slovenia Forest Service. This led to the establishment of *Together for Karst! (Skupaj za Kras!)*, a partnership between the three affected municipalities – Miren-Kostanjevica, Komen, and Renče-Vogrsko – the national forest service, and the charity organization Vrabček upanja. The aim of this partnership was to provide a platform for collection and transparent use of the donations for the purposes of forest and local community restoration as well as the prevention of further forest fires.

As a part of the platform, a myriad of communication channels and activities were established, including an online platform with a website, press releases, multiple donation paths such as phone and SMS, and fundraising events and activities – among them, a nationally televised fundraising concert. In total, over €300,000 was raised to assist with the restoration, and over 30 organizations and companies supported the platform with their products, donations, and media. In addition to the donations through the platform, some donors conducted large independent projects to aid forest and biodiversity restoration in the affected forests.

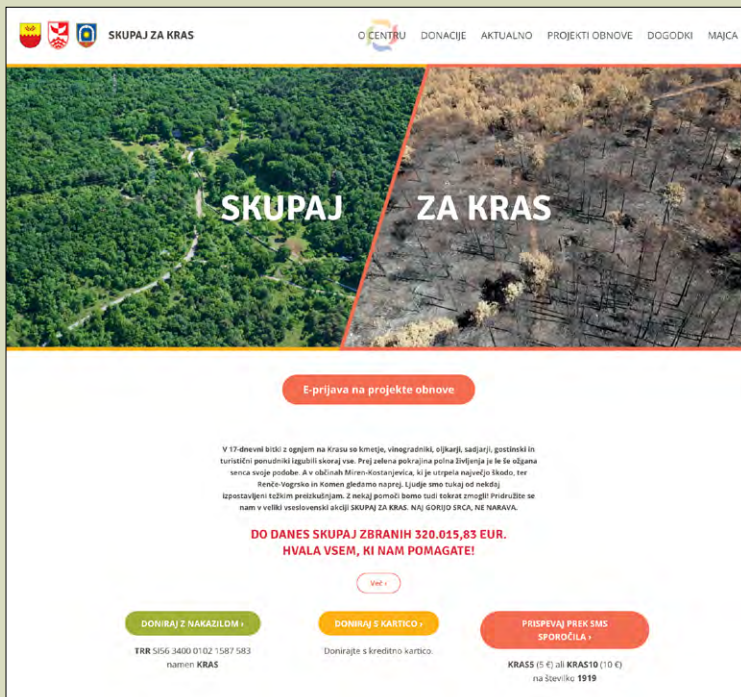


Figure 9. 'Together for Karst!' official website.



Figure 10. Boštjan Košiček, head of the local forest management unit, presenting the facts about forest regeneration at the nationally televised fundraising concert.

After the end of the forest fire, activities for the preparation of the post-fire restoration and regeneration plan ensued. Due to unprecedented public attention, preparation of the plan involved many different audiences and stakeholders, and stakeholder participation was crucial. Approximately a month after the end of the fire, an international workshop was held by the LIFE SYSTEMiC project, where the forest restoration plan preparation team, representatives of Slovenian and international forestry, local communities, forest owners, NGOs, and others came together to plan for the next five years.

The following day, a press conference and media day were held: foresters and international scientists presented key points of the forest restoration plan. Since there was great interest about the tree species and other aspects of post-fire forest restoration, this was also an excellent opportunity to communicate the findings of forest science to the public. Evening news programmes featured prominent forest scientists discussing key aspects of the forest restoration process in the areas affected by the forest fire. In the space of one year after the forest fire, over 500 media clips on the forest fire and forest fire restoration were recorded.

By local request, another participatory workshop was held separately to gather the inputs from the local population. At the end of September 2022, the Slovenia Forest Service submitted the plan to the Ministry of Agriculture, Forestry and Food, and the plan was further amended in the participatory process at the ministerial level. In total, the cost of the forest restoration was estimated to be €24 million.

In the autumn after the forest fire, the public was eager to contribute to the forest restoration efforts. In November 2022, two tree-planting days were organized. On 25 November, a forest regeneration (tree planting) day was organized for the companies and organizations that donated funds to restoration efforts. The mayors of the three affected municipalities, the Secretary of State for Forestry, the representative of the European Commission in Slovenia, the Director of the Slovenia Forest Service, and directors and representatives of 30 organizations signed a letter of intent to further contribute



Figure 11. Initial stakeholder participation activities to inform about the post-fire forest restoration plan

to the post-fire forest regeneration efforts. The following day, over 1,000 volunteers from all over Slovenia planted seedlings in the areas affected. In December, a forest restoration activity of sowing seeds of local deciduous trees took place; 150 volunteers sowed over a tonne of local oaks, maples, limes, European nettle trees, and oriental hornbeams. Also in 2022, over 2,200 individuals planted over 18,000 seedlings of maples, oaks, and other local deciduous trees.

Restoration efforts continued in 2023, with around 2,000 volunteers planting some 20,000 seedlings and 1.2 tonnes of forest tree seeds on 127 hectares. New technological approaches were also tested, such as seeding with aerial drones and seed-bombs in harder-to-reach areas and using new methods of ecological seed protection for seeding.

Donations and volunteers offered a significant contribution to the forest restoration efforts while also popularizing forestry and forest restoration practice and science.



Figure 12. **Volunteers significantly contributed to forest restoration.**

LESSONS LEARNED

- Communicate early and often, internally, and externally.
- Communication should be guided by practical needs.
- Focus communication efforts to help solve and contribute to pressing issues and practical needs.
- Create partnerships to minimize conflicts and pool resources.
- Use media channels strategically. According to an analysis by the Slovenia Forest Service, radio and internet publications were the most used, followed by television and print media.
- Do not hesitate to call for help, but be prepared when help comes.
- Work with key stakeholders to create commonly acceptable solutions.

CASE STUDY 4: THREE KEY STEPS TO BUILDING A NATIONWIDE TREE EQUITY MOVEMENT

Jad Daley,
President and CEO of American Forests

Period: June 2019 – Present

Problem: America has largely underinvested in its urban forests until recently. Historically, at the federal level, urban trees were typically treated like scenery rather than critical infrastructure for health, resilience, and community well-being that must be equitably distributed and maintained in communities. While a rising Tree Equity movement has overcome long odds to rally unprecedented local commitments to equitable and enhanced tree cover and funding for trees in US cities, long-term success is still in the balance.

Communication instruments used: Cultivating the concept of Tree Equity in the US has been a deliberate and significant effort. The intended meaning goes well beyond just counting the trees until everyone has an equitable share. American Forests created a tool

called the [Tree Equity Score](#). This free online tool maps tree inequities across every urban neighbourhood in the US and correlates these tree gaps with data on economic status, age, race, health status, linguistic isolation, and the actual temperature differential in each neighbourhood compared to the citywide average. This tool was paired with strong messages such as *a map of trees today is a map of race and income, and you cannot air condition a bike path*. These communication tools were used relentlessly in all available communications channels from the magazine *American Forests* and social media to mainstream outlets such as the *New York Times* and *Design Thinking*.

Evidence of success: The US Government has made available unprecedented funding to build Tree Equity. Diverse cities such as Detroit, Phoenix, Nashville, Seattle, Los Angeles, Boston, and Miami have developed lasting and inclusive partnerships to deliver equity and climate-focused urban forestry. These efforts are also establishing replicable models for inclusive and equitable coalition building and workforce development programmes. This success is now being replicated in other countries, most notably the United Kingdom.

THE CASE STUDY

American Forests publicly launched its efforts to build a Tree Equity movement with a call-to-action blog, 'Let's Commit to Tree Equity in America's Cities' published online in Medium on June 3, 2019. The concept of Tree Equity moved fast after that: at the close of the 2nd World Forum on Urban Forests in Washington, DC in October 2023, I gave a keynote speech and was overwhelmed with realization - Tree Equity has reshaped the field of urban forestry in America is part of a new movement growing organically around the world.

Our work to build a Tree Equity movement in the US was designed from the very outset to help inform and catalyse other efforts globally. We are proud to have cities across America committing to remedy systemic inequities of tree cover by income and race, and USD 1.5 billion in new US Government investment rolling out

in all fifty states to help make this happen. But nothing about this has been inevitable.

American Forests coined the term 'Tree Equity' and began to develop this as a new focusing concept for the urban forestry movement in 2019. We were spurred on by the glaring reality that a map of trees in American cities and around the world is too often a map of income and race/ethnicity in ways that transcend outcome.

"Achieving Tree Equity means that all neighbourhoods within a city will reach a citywide standard of tree cover that is feasible and appropriate for each city's unique climate and context," I wrote in 2020, as the concept began to gain traction. "Given the immense consequences, American Forests sees Tree Equity as a moral imperative and also an opportunity for greater economic equity because we can link people in marginalized communities into career opportunities, advancing Tree Equity across their neighbourhoods."

"Tree Equity is the idea that all communities have equitable access to the benefits of trees where they live. While some urban areas enjoy abundant greenery and tree cover, others lack these essential natural assets. Tree Equity must be embedded into urban forest planning," says the website of the Woodland Trust in the United Kingdom, in a sign of how global the concept has become since then.

To help support the success of new and ongoing efforts in other nations (such as the UK but also beyond to the Global South), this case study takes stock of how the US reached where it is today with funding for Tree Equity and the movements to absorb it, and what lessons can be learned. Towards this end, here are the **key steps** to building the US Tree Equity movement that could be helpful around the globe. All require communication.

Step 1. Focus on Communicating One or Two Overwhelmingly Compelling Benefits

There are so many reasons why trees in our communities are important that the average speech about urban forests sounds like a laundry list of societal goods. All the different benefits are real, and there is one simple and most urgent truth: trees naturally cool and

clean the air, and we need these services to combat climate change.

Here in the US we have used this narrow focus to challenge the outdated idea that city trees are just scenery. We have relentlessly made the case that we must use natural cooling from trees if we have any hope of equitably protecting people from climate-fuelled extreme heat and air pollution without killing our climate in the process.

Consider that we already have seen a near doubling of heatwave days globally and heat-related deaths among seniors. If we see 2 degrees Celsius of additional warming, heat deaths among older people are projected to rise another 370 per cent by the middle of this century. In the US, heat deaths are already more than 12,000 annually and projected to rise to nearly 100,000 people per year by the end of century.

We cannot just air condition our way out of this. Consider that only 33 per cent of homes globally have air conditioning (AC), according to the International Energy Agency, and that lower income people around the world who face the highest health vulnerabilities also face higher barriers to AC.

An over-reliance on AC will also further damage our climate. AC is responsible for 4 per cent of greenhouse gas emissions with anticipated tripling by mid-century as demand rises. And AC comes with the added impact of waste heat that AC units eject into the air, which can raise temperatures in a city by as much as 1.5 degrees C.

Then there is the problem of creating safe outdoor spaces in the heat: you cannot air condition a bike path. This makes the natural AC and clean air benefits from trees essential to create the safe outdoor spaces we need to help people maintain healthy and active lifestyles through hotter days.

That is why we cannot equitably protect people's health or our climate without leveraging the profound natural cooling power of trees. When you have established this as the central 'why', it then creates a whole new level of societal and political power when you document the systemic and morally insupportable inequity of tree cover in cities prevalent in America and around the world.

Step 2. Make the Connections Clear

My organization, American Forests, made the connection between trees and human well-being visible to all by creating a tool called [Tree Equity Score](#). This free online tool maps tree inequities across every urban neighbourhood in the US and correlates these tree gaps with data on economic status, age, race, health status, linguistic isolation, and the actual temperature differential in each neighbourhood compared to the citywide average.

At a national level, Tree Equity Score shows that US neighbourhoods with the highest percentage of people in poverty have on average 26 per cent less tree cover and are on average 7 degrees Fahrenheit (3.9 degrees Celsius) hotter than the citywide average. For neighbourhoods with the highest percentage of people of colour, the difference is 38 per cent less tree cover on average and more than 10 degrees Fahrenheit (5.6 degrees Celsius) hotter. Our data show that in some specific neighbourhoods the heat differential is nearly 20 degrees Fahrenheit (11 degrees Celsius).

This is a life-or-death difference. As evidence, one study of the 2015 heatwave in Europe that killed thousands found that a doubling of tree canopy in the right places would have reduced heat deaths by 40 per cent, saving 2,600 lives. Similar studies in the United States, such as the Dallas Heat Study led by Georgia Institute of Technology's Urban Climate Lab, have found the same kind of life-saving potential in expanded tree cover.

Even better, trees combine life and climate-saving natural cooling and carbon sequestration with air purification, meaning they trap and deflect the air pollution that is exacerbated by high temperatures. It is this case for action that has transformed how America thinks about and invests in urban trees.

Step 3. Coin a Powerful Concept and Prove It

I am proud that American Forests created the term and cultivated the concept of Tree Equity as a shared focus for the whole movement, not some kind of branding exclusive to our organization's urban forestry work. Importantly, our intended meaning goes well beyond

just counting the trees until everyone has an equitable share. For example, are we putting enough technical rigour into how we select trees and design plantings to maximize their health equity benefits for local residents who face the greatest health burdens?

Of equal importance to the work itself is answering the question, what does it mean to pursue Tree Equity in a manner that is actually equitable and inclusive for the community? Are we involving community members from the very outset – not after all the plans are made – and creating the space for frontline leaders and citizens to play leading roles in citywide efforts?

When we do rally millions to billions of US dollars for Tree Equity, are we taking steps to turn this urban forestry investment into an economic opportunity for people in the neighbourhoods where this work is taking place? Are we ensuring that special attention is given to those facing the highest barriers to employment, such as formerly incarcerated people? It is exciting to see here in America that the Tree Equity movement strongly answers these questions in the affirmative.

The leadership of our pathfinding US cities is being spread by a strong community of ‘hummingbird’ non-profits, corporate and philanthropic partners, and state and federal agencies who are helping to identify the best approaches and bring them into the cities that are just getting started.

We see many other examples of Tree Equity around the world. It is time for a global community of practice to advance Tree Equity implementation, with America having much to share and much to learn from others.

Step 4. Be Bold but Caring

The urban forestry field in America has historically suffered from a second-class citizen mentality. Historically, the total allocation for urban forestry in the United States Forest Service budget has run at USD 30–40 million per year, out of a USD 5 billion total agency budget to care for the nation’s forests. On multiple occasions even this pittance was proposed for total elimination, signalling clearly

that our national government saw urban forests as a local matter and not one of great significance.

So how on earth did we secure USD 1.5 billion in the Inflation Reduction Act of 2022 for grants to cities and their partners to pursue Tree Equity?

Powered by the data-driven and urgent ‘why’ that I have defined above – how Tree Equity can help save lives and our climate – the advocates for this funding began speaking of our ambitions years earlier in terms of what we really need versus incremental gains in funding over what we had been getting. We stopped accepting and started asking. We did not do this quietly or only with allies, and gave every audience the benefit of the doubt that they might embrace this dramatic new policy direction if presented with the right case for action.

Step 5. Find the Right Champions

Our movement found ideal champions such as United States Senator Cory Booker (District of New Jersey), the former mayor of Newark, New Jersey, who could speak from his own experience and his authority as a climate justice leader to educate his colleagues in Congress and inspire a totally new political narrative about urban forests. Senator Booker’s Climate Stewardship Act, introduced in 2019, was the first legislation in US history to propose billions for urban trees, crossing a critical barrier of perception and fostering more urgent discussion of this idea.

This groundwork was critical, because the final formulation of the Inflation Reduction Act was an act of cutting out billions of US dollars of important climate funding, not adding more in. That makes it even more remarkable that urban forests, something long disdained for federal dollars, not only remained in the final package but retained a stunning USD 1.5 billion – the largest such investment in world history.

In sharing these vital lessons learned, we are humbled in America to recognize that Tree Equity leadership and innovation is flourishing worldwide: Freetown the Treetown, Medellin Paris, the ‘3-30-300’ formula pioneered by Professor Cecil Konijnendijk van den Bosch, and so much more.

I believe that the American experience has much to offer the world, from replicating our Tree Equity Score (as we have done with partners in the UK) to collectively learning how to do this work better with our communities, and how to help our public officials make the investment we need. Thousands of lives per year and the fate of our climate depend on our collective success.

LESSONS LEARNED

- Make the right case for action and relentlessly make the case. Tree Equity is a term coined by American Forests meant to capture both the current reality of tree inequity and a new goal all in one. It is a vision statement, and a term created for our collective use as a community.
- Focus your communication on key benefits rather than delivering a long list of benefits. You could not invent a more perfect device than a tree for the twin challenge of extreme heat and air pollution fuelled by climate change.
- Make the connections clear. The Tree Equity Score tool is free and allows anyone to see the links between trees and well-being. We want an individual citizen and the mayor of a community to be able to access the same data on trees.
- Coin a powerful concept. We lean into the word equity to challenge ourselves and others to consider; what are all the attributes of equity that we can leverage from this investment in tree cover?
- Be bold but caring. Challenge conventional thinking. For this effort, we spoke truth to power with loving ferocity.
- Find champions. Of huge importance, our champion Senator Booker and other key leaders such as Senator Debbie Stabenow (Chair of the US Senate Committee on Agriculture, Nutrition, and Forestry), made sure that the USD 1.5 billion funding remained flexible enough that it can be used for the full cycle of urban tree planting and tree care needed to sustain Tree Equity, and can support vital aspects of a right and inclusive approach such as coalition building and workforce development.

For more information:

- Jad Daley, President and CEO of American Forests (jdaley@americanforests.org; @JadDaley on X).
- Benita Hussain, Chief Program Officer for Tree Equity at American Forests. (BHussain@AmericanForests.org)

CASE STUDY 5: USING A KNOWLEDGE, ATTITUDE, AND PRACTICE SURVEY TO DEVELOP COMMUNICATION CAMPAIGNS TO COMBAT FOREST CRIME IN THE LOWER MEKONG REGION

Katrina Borromeo,
REDD+ Knowledge Coordinator, United Nations
Environment Programme/UN-REDD Programme

Period: January 2022–December 2023

Problem: Environmental crime is thriving in the Lower Mekong in a context of weak governance, unclear legal frameworks, and regulatory regimes. As a result, deforestation is devastating, and biodiversity is under siege. The United Nations Environment Programme (UNEP, 2024) wanted to carry out national communication campaigns to address forest crime, but little was known about the populations' knowledge, attitude, and practice (KAP). This made it hard for forest science communication and communication addressing social norms to be designed.

Communication instruments used: Among others, a KAP survey to guide communication efforts to address forest crime.

Evidence of success: The KAP model approach was able to tease out differences between countries and their rural and urban populations so that communication on forest science communication and other important issues could be sculpted and crafted to be relevant for the different communities that made up the ‘audience’.

THE CASE STUDY

The Lower Mekong region – consisting of Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam – is a biodiversity hotspot of global significance. Its vast forests are important carbon sinks, crucial in the fight against climate change, and home to critically endangered species such as the Saola (*Pseudoryx nghetinhensis*) and Mekong giant catfish (*Pangasianodon gigas*).

The five Lower Mekong region countries face severe forest degradation and deforestation: 15 to 30 per cent of global timber production is estimated to be illegally logged from their forests (Nellemann et al., 2016). According to FAO, between 1990 and 2015 a total of 4.7 million ha of forest in the Lower Mekong region is reported to have been lost (FAO, 2015; Yasmi et al., 2017).

The fate of the Lower Mekong forest is connected to the rapid global growth of environmental crime: experts estimate environmental crime to be worth USD 90–250 billion annually, making it the fourth largest crime sector after drugs, counterfeits and trafficking (Nellemann et al., 2016). Forest crime itself is worth an estimated USD 50–150 billion annually. International criminal enterprises in the illegal logging business move illegally exploited timber through complex international supply chains and are often involved in multiple environmental crimes, such as illegal wildlife trade, fishing, mining, and waste disposal. Forest crime is thus connected to a wider web. In the Lower Mekong, weak governance, corruption, unclear legal frameworks, and regulatory regimes allow it to thrive, causing massive loss of tax revenue that could be used to pursue sustainable development approaches, including managing forests sustainably for the benefit of all.

Many programmes have addressed forest crime in the Lower Mekong region. Efforts have included:

- creating economic incentives to decrease consumer demand for hardwoods;
- promoting certification of timber and wood products;
- using communication to spur society-wide social change to make the use of protected tree species socially unacceptable;
- enacting laws and policies to regulate logging and timber exports;
- protecting forests by encouraging domestic economic development through value-added wood processing, particularly in Thailand and Viet Nam;
- strengthening forest and land-use governance.

This case study looks at how a UN programme conducted a KAP survey with the aim of informing national behavioural change campaigns to combat forest crime. The campaigns needed to design interventions and incentives to encourage both suppliers and consumers to shift away from illegally harvested hardwoods to certified forest products and alternative and more sustainable wood species.

KAP surveys are routine in public health interventions but rare to unknown in environmental or natural resource management projects. This constitutes a major way to improve communication of forest science. It was a pioneering undertaking.

From 2021 to 2023 the UN Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD) implemented an initiative for ‘Addressing Forest Crime Through Improved Governance in the Lower Mekong Region’.

Called the UN-REDD Lower Mekong Initiative in short, the project team decided to use the KAP score model to avoid the common problem that development programmes and initiatives face: outcomes that are intangible, particularly changes in behaviour that are difficult to measure. This challenge is especially severe for prevention-type programmes (Lindgren, 2019).

The KAP score model addresses the intangibility of programme outcomes by producing a proxy measure focusing on behavioural compliance. For example, if someone were asked how many trees were saved as a result of a campaign against illegal logging, it would

likely be difficult to answer accurately. However, a KAP score can be a proxy indicator, which is useful identifying where the participants are in the knowledge journey. A score of 70 out of 100 would imply that they are in the higher stage of knowledge awareness, whereas a score of below 50 means that knowledge and behavioural interventions are needed.

From January to July 2022, a baseline study was conducted targeting respondents in capital cities of four Lower Mekong countries (Naypyidaw, the capital of Myanmar, was omitted) and rural communities near forest areas in Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam. In China, the cities of Shanghai, Beijing, and Nanchang were targeted. There were over 2,400 respondents.

The KAP survey generated deeply useful findings: respondents had varying levels of knowledge, held different attitudes, and did not behave uniformly. On knowledge indicators, the KAP scores show that respondents have a good understanding of what is illegal and legal, and how forest crime impacts the environment. But they do not see the link between consumer demand and the incidence of forest crime.

Looking at attitude indicators, most respondents express apathy towards illegal logging and think the problem is exaggerated. One in two respondents do not care or are not willing to act against forest crime. Moreover, they do not feel that illegal logging is a problem that can be solved, and there is a perception that buying furniture from protected tree species is more worrisome than the impacts of illegal logging.

Finally, on the practice indicators, China stands out as the country with the highest level of compliance. Respondents in China say they prefer to buy certified wood products and have participated in forest conservation activities. In contrast, respondents from Myanmar, Cambodia, and Lao PDR show lower levels of compliance in both urban and rural areas. In those countries, fewer people say that they report illegal logging or trading of protected trees, and most individuals have not supported forest protection activities or donated money to environmental causes.

The weighted KAP score is as follows: Viet Nam (52), followed by China (47) and Thailand (44), indicating that these countries may be ready to transition from knowledge to action. Meanwhile, KAP scores were relatively low in Myanmar (22), Cambodia (19), and Lao PDR (7): these countries appear to be still in the 'knowledge formation' stage.

TABLE 8.5.1: KAP SURVEY

KNOWLEDGE INDICATORS
• Know what is legal and illegal
• Know the causes and impacts of forest crime
• Know how to address forest crime

ATTITUDE INDICATORS
• Care about illegal logging and illegal forest trade
• Think that forest crime can be solved by this generation
• Think that the economy is more important than forests

BEHAVIOUR/PRACTICE INDICATORS
• Buy certified forest products
• Report illegal logging and illegal trade activities
• Support environmental protection activities/donate money to environmental causes

Disaggregating the data shows the following:

- Awareness of illegal logging and forest crime is high in all countries, and highest in Viet Nam (81 per cent compared with the average of 69 per cent).
- In rural areas, respondents have greater awareness of the importance of native trees than respondents in urban areas (90 per cent versus 71 per cent).

- In both urban and rural areas, respondents have generally low awareness of which tree species are endangered (43 per cent).
- Like respondents in Thailand and Myanmar, Vietnamese respondents (83 per cent) agree that a profitable timber trade is important even if it means some trees cannot be saved.
- One in two people do not care about illegal logging and illegal forest trade (50 per cent).
- There is a disconnect between knowledge and purchasing habits. Over 80 per cent of Chinese consumers are aware of sustainable purchasing, but only a small portion will purchase sustainable products.
- Across all countries, young people reported higher awareness of forest crime – 85 per cent compared with 70 per cent of older people.
- For all indicators, no significant differences were found when disaggregating responses from men and women.

Analysing the survey results, common threads across all countries include a lack of knowledge regarding how consumer demand drives illegal logging; attitudes dominated by apathy (do not care about illegal logging); and unwillingness to report a forest crime or support forest protection activities. Strengthening awareness of the links between consumer demand and forest crime is key. Also important is, when possible, engaging with people who can be regarded as opinion leaders to influence others.

It emerged clearly from the KAP survey that forest crime can be addressed by influencing social norms. The study gauged social norms as they can influence people to behave against their conscience or what they believe is right. Social norms need to be tackled to change behaviour.

In urban areas, social norms were measured by presenting respondents with a scenario in which their parents offered to buy them new furniture made from the threatened rosewood tree (*Dalbergia cochinchinensis*). When learning the furniture came from a protected tree species, they had to decide whether to accept them or not.

Hence, social norms could come into play if (1) rejecting the furniture would not be socially unacceptable or (2) doing so would be considered abnormal behaviour. In rural areas, the scenario was being offered a job involving illegal logging.

Respondents were segmented into three groups: those with weak, moderate, or strong social norms. The results for each country, split by urban and rural areas, were as follows:

- In Cambodia and Lao PDR, social norms were ranked as ‘moderate to strong’, meaning that about 63 per cent respondents said that they would likely follow norms and would either refuse or accept hardwood furniture and jobs involving illegal logging if they are considered common practice.
- In Thailand, Viet Nam, China, and Myanmar, social norms were considered ‘weak to moderate’: about 59 per cent respondents said that they are not influenced by external factors in their furniture purchasing habits or job choices. In Thailand, social norms in rural areas were found to be significantly stronger than in urban areas.

As can also be seen, social norms encouraging forest crime were more pronounced in Cambodia and Lao PDR, and in rural Thailand. Engaging with opinion leaders to influence others would be a particularly good campaign strategy in these countries.

Media usage trends across the Lower Mekong region are also important to know how to design a behaviour change campaign and engage local people with content related to forest crime. The study also captured this. Smart phones and televisions are the main media devices owned by people across the surveyed countries. Ownership of such media devices is clearly linked to the development stage of the country and access to consumer goods.

People consume and trust information from a mix of mainstream news and social media sources, particularly Facebook and YouTube for Lower Mekong countries and national newspapers for China. Also, top influencers for potential campaigns against illegal logging include family, friends, government officials, and environmental

protection NGOs. Respondents prefer to share information via their family, friends, and social media channels.

The KAP survey not only highlighted the problem but also pointed to solutions. It suggests that to combat forest crime effectively, interventions must be multifaceted, addressing the economic, political, and societal dimensions. This involves developing national communication plans tailored to the specific needs and contexts of each country, leveraging survey findings to create campaigns that resonate with the target audiences and address their unique barriers to action.

As a result of the KAP survey results, the following communication plans and campaigns were developed with government counterparts.

- China: Launch and roll-out of the 'FOREST FOR LIFE' campaign focused on asking consumers to shift purchasing habits in favour of the conservation of valuable species such as rosewood. It also aims to transition perspectives from apathy to active concern and engagement.
- Cambodia: Roll-out of an educational video series on rosewood aimed at raising awareness among forest-dependent communities about anti-illegal logging regulations and promoting alternative livelihoods.
- Lao PDR: Roll-out of a campaign using public speakers to disseminate information on illegal logging and the illicit forest trade, enhancing public knowledge and awareness.
- Myanmar: Plans for community-wide open forums to broaden awareness regarding legal and illegal forest trade, using NGO networks to amplify the message.
- Thailand: Roll-out of an action-oriented campaign encouraging the use of the Pitak Prai app for reporting forest crimes, and supporting changes in decision-making and lifestyle.
- Viet Nam: Plans for a youth-focused campaign with forest-dependent communities as examples of sustainable environmental stewardship, in collaboration with government authorities.

Indicators have been developed, and the effectiveness of these campaigns will be monitored over time. Initial results seem promising.

For instance, in China, since January 2024 the [‘Forest for Life’](#) exhibit has been displayed at Beijing International Airport and has so far attracted around 3 million visitors. The exhibit’s impact led the [National Forest and Grasslands Administration to convene the first governmental forum on enhancing forest management in the Lancang-Mekong region in March 2024](#), focusing on crucial policy and regulatory changes. It also sparked related activities such as tree-planting projects by various NGOs and youth groups.

LESSONS LEARNED

- To enable lasting, meaningful, and transformational change to end forest crime, pillars such as providing alternative livelihood/market access, forest viability, safeguards, and behavioural change communication need to come together.
- KAP surveys can help create communication of forest science that is tailored to distinct constituencies, including rural and urban populations living in a range of national cultures.
- Explaining the importance of safeguarding indigenous trees is fundamental to forest science communication in the context of forest crime.
- Similarly, it is important to explain the forest science that underpins why it is essential to shift to more use of sustainable alternative tree species.
- An important forest science communication point is the relationship between tree diversity and biodiversity, healthy ecosystems, and landscapes, and purchasing habits of consumers.
- Media through which to convey forest science in the Lower Mekong Region are not lacking. The challenge is content that addresses social norms.
- For ‘wicked’ problems such as forest crime, communication needs to go beyond delivering facts to creating social and behaviour change.

Additional resources and references

- FAO (2015) Global Forest Resources Assessments <https://www.fao.org/forest-resources-assessment/past-assessments/fra-2015/en/> (accessed 16 July 2024).
- Lindgren, D., and Kelley, S. (2019) A new way of measuring behavioural compliance for prevention program interventions using the KAP score. *Development in Practice*, 29(4), 489–500. doi: 10.1080/09614524.2019.1569590
- Nellemann, C., Henriksen, R., Kreilhuber, A., Stewart, D., Kotsovou, M., Raxter, P., Mrema, E., and Barrat, S. (eds) (2016) *The Rise of Environmental Crime: A Growing Threat To Natural Resources, Peace, Development and Security*. <https://www.grida.no/publications/344> (accessed 17 July 2024).
- UNEP (2024) Communication to combat forest crime in the Lower Mekong and in China: a handbook based on the findings of the knowledge, attitude, practices survey on illegal logging and illegal forest trade in the Lower Mekong and in China. <https://www.unep.org/resources/publication/communication-combat-forest-crime-lower-mekong-and-china-handbook-based-O> (accessed 17 July).
- Yasmi, Y., Durst, P., Haq, R.U., and Broadhead, J. (2017) Forest change in the Greater Mekong Subregion (GMS): An overview of negative and positive drivers. Technical Report. FAO, Bangkok. <https://doi.org/10.13140/RG.2.2.24917.32486>

CASE STUDY 6: BRANCHING OUT: IUFRO'S FOREST PODCAST

Jose Bolaños,
Communications Manager, IUFRO

Period: March 2023–June 2024

Problem: The International Union of Forest Research Organization (IUFRO)'s large and diverse network needed a greater variety of digital and more tailor-made communication formats, while the XXVI IUFRO World Congress needed promotion. IUFRO's World Congresses are held only every five years, so outreach needed to be broadened.

Communication instruments used: A podcast was used based on IUFRO's communication strategy and the insights of IUFRO communication experts using the XXVI IUFRO World Congress as a 'hook'.

Evidence of success: In 2023 alone (first episode released 31 March 2023), there were 1,500 downloads. The podcast reached over 200 followers on Spotify, and 45 on Apple Podcast. THE CASE STUDY

IUFRO is a global network of forest scientists. It fosters scientific collaboration between an estimated 15,000 researchers from more than 630 member organizations in 115 countries.

Following the trend of podcasts that became a global phenomenon during the pandemic, the IUFRO comms team realized that a podcast could play a role for this far-flung network. Looking around for a topic to start off the first season, the team agreed that the XXVI IUFRO World Congress to be held in Stockholm, Sweden from 23 to 29 June 2024 lent itself perfectly to this idea.

By highlighting the Congress themes, the podcast called 'Branching Out: The Forest Podcast' would bring the latest developments of forest science to the table while at the same time inviting people to join the Congress. The themes are: **Strengthening forest resilience and adaptation to stress, Towards a responsible forest bioeconomy, Forest biodiversity and its ecosystem services, Forests for sustainable societies, and Forests for the future.**

The thinking around the podcast had its origins in *IUFRO Spotlight*, a regular written publication that explained forest research findings from the IUFRO network to the wider public. The IUFRO website describes IUFRO Spotlight as a "plain language initiative that aims to introduce, in a timely fashion, significant findings in forest research from IUFRO member organizations and/or IUFRO officeholders to a worldwide network of decision makers, policymakers and researchers." Highlights of those findings, along with information on how to access the full documents, are encapsulated and distributed in emails and blogs.

The IUFRO communications team reasoned that podcast guests could be enlisted to break down complex forest topics in a similar way, and that listeners would learn about the contribution of forest science to a sustainable future of forests and society. The guests, it was envisioned, would represent diverse voices and dwell on success stories from around the world. The podcast would also target different disciplines and sectors, and new potential members and audiences, so they can learn more about forest research.

It was clear from the start that the show should follow IUFRO's

communication strategy and the related action plan and would consult with communication experts from IUFRO's Working Party on Communication and Public Relations to benefit from their experience.

Coming up with an appealing name was challenging. The team compared over 20 existing forest-related podcasts, including the 'UN Forest Podcast', 'Let's Talk Trees' by CIFOR, 'Forest for the Future' by FSC, 'Forestcast' by USDA Forest Service and 'Science in Times of Crisis' by the International Science Council. It also involved creating a list of related words, and collaboration through a digital board for brainstorming (Miro). A sound logo was created according to the feelings of what IUFRO wants to project - cheerful and inspiring. The producer was David Torres of *Loud and Beyond*.

The format of the 15- to 20-minute-long podcast is four interviews, preceded by a teaser and an introduction, and some take-home messages at the end. The show follows a draft script that combines the presentation of the topic and questions that lead the conversation. Given the different time zones of the guests, the interviews are recorded offline using Zencast™. After a clean script is written, the IUFRO communications team re-records the

interventions of the hosts and sends the script and all recordings to a radio producer to create a broadcast-ready product.

Right from the start, one of the podcast's characteristics was that it had a fixed host and a rotating co-host. Having a rotating co-host enables more voices to be part of the show. What is more, it engages network members, illustrates the diversity of IUFRO, helps the promotion of each of the episodes, and creates community around it. So far, co-hosts have hailed from four countries (USA, Poland, Sweden, and New Zealand) and four institutions



Figure 6.1. **For the artwork, IUFRO wanted a background of different forest colours: the leaf references the name and IUFRO logo.**

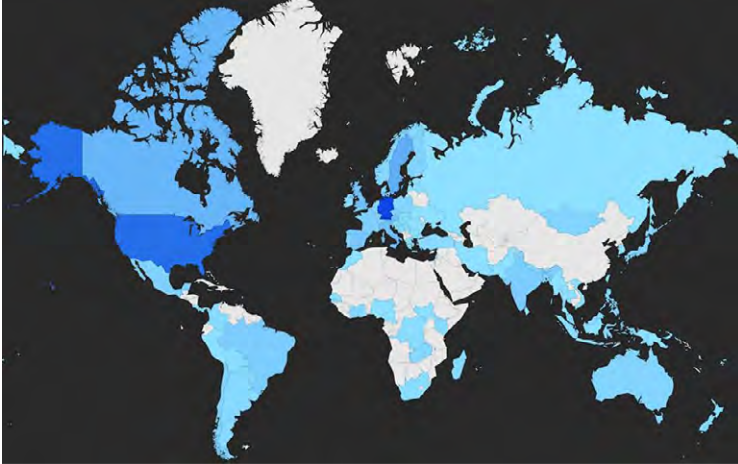


Figure 6.2. **This map shows the geographic locations of the listeners. It helps to identify regions where the podcast is gaining traction, and tailors the content or marketing efforts accordingly.** (Source: Zencast)

(USDA Forest Service, Forest Stewardship Council – FSC, Swedish University of Agricultural Sciences – SLU, and Landcare Research). The fixed host is the author, Jose Bolaños, a member of the IUFRO communications team, who brought audio-visual production experience.

The podcast was launched with the first episode airing on 31 March 2023. The topic was general information about the XXVI IUFRO World Congress. The guests were: Chair of the Congress Scientific Committee Elena Paoletti (National Research Council of Italy); Chair of the Congress Organizing Committee Fredrik Ingemarson (SLU); IUFRO President John Parrotta (USDA Forest Service); and former Outstanding Doctoral Research Award Winner Sarah Burns (Dresden University of Technology). To date, it has been listened to at least 2,000 times. A further five episodes were aired before the Congress, approximately one every three months. Meanwhile, you should definitely check out our podcasts available at Spotify and Apple Podcasts (see ‘Additional Resources’ below). Most listeners are from the USA, Germany, and Sweden. The podcast about forest resilience and adaptation, which brought examples of challenges and solutions from Ghana, the United States, the United Kingdom,

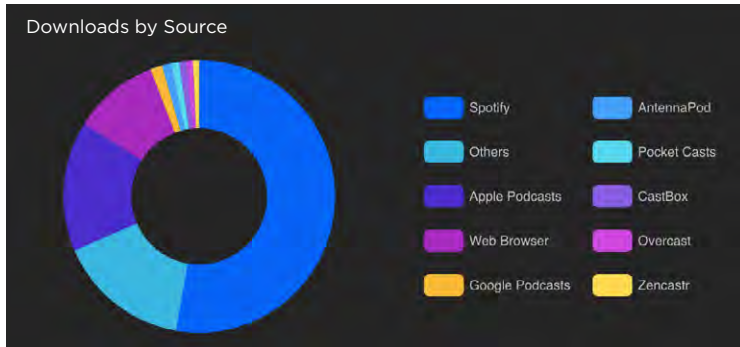


Figure 6.3. **More than 50 per cent of the downloads are done through Spotify, so when promoting it, IUFRO constantly uses this link to have a multiplier effect.**

and Sweden, was particularly successful. According to Spotify’s year wrap-up 2023, it was streamed 157 per cent more than the rest. And according to the same report, the show was shared over WhatsApp (44 per cent), Direct Link (33 per cent), Instagram (11 per cent), Facebook (6 per cent), and others.

At present ‘Branching Out: The Forest Podcast’ targets the IUFRO scientific community and similar audiences. However, the author plans to extend to broader audiences. Therefore, it maintains a not-too-technical tone. However, it is sufficiently technical for scientists from different backgrounds to learn from each other’s research.

The podcast was integrated into IUFRO’s main website under ‘Publications’. By embedding it directly, visitors can now access all episodes with insights from leading experts. IUFRO notifies all subscribers of IUFRO’s network via email when a new podcast episode is released. For every episode, the team shares posts on X, LinkedIn, Facebook, Instagram, and Threads with a photo of each participant and their most thought-provoking quotes. Posts are tagged when possible. For postcards that are distributed at events, the team also generated a QR code, which when scanned leads directly to the podcast on Spotify. It also sends an article about each episode as it becomes available online to organizations such as the International Society of Tropical Foresters or the International

Science Council. The articles have been also republished by EFI Network News and FAO UNECE Forest Information Billboard, among others.

After the Congress, the next season is likely to focus on the outcomes of IUFRO task forces on forest education, forests and water, health, and the bioeconomy. The aim is to highlight interdisciplinary research cooperation. Podcasts are now fully part of IUFRO's communication of forest science.

LESSONS LEARNED

- Arranging recording times for the podcast guests is time consuming.
- The balance between non-technical language, the storytelling, and the handling of scientific results is always difficult to strike.
- The podcast has to be sufficiently technical so that the scientific community recognizes itself in it while using a language accessible to interested members of the public.
- Making the podcast short and impactful is ideal. However, it is sometimes impossible to accommodate all the desired content within the allotted 20 minutes.
- It is preferable to break down content into bite-sized chunks. Another podcast could be created for what cannot be accommodated.
- Involve multiple voices.
- Build your audience through social media and working with affiliated organizations.
- Have fewer guests and focus on a specific topic.

Additional resources

The podcast is available at <https://www.iufro.org/publications/iufro-podcasts/> (accessed 17 July 2024) and at [Spotify](#) and [Apple Podcasts](#)

The MethodKit for Podcasts that was deployed was launched at the *PodcastDay24 Conference* in London on 4 October 2022. <https://methodkit.com/podcasts/> (accessed 17 July 2024).

CASE STUDY 7: FOREST SCIENCE COMMUNICATION BY ENVIRONMENTAL NGOS IN CAMEROON: THE CASE OF ERUDEF AND FODER

Atebeh Uta-Rein Lekah,
Department of Academic Affairs and Cooperation
University of Yaoundé I, Cameroon

Period: 2013–2024

Problem: In Cameroon, where sustainable forest management is urgently needed to address multiple challenges, forest science communication is helping increase awareness, change perceptions, and influence decision-making, and actions and reactions with respect to forests. However, this communication is currently insufficient, and environmental NGOs (ENGOs) have a lack of trained communication staff.

Communication instruments used: Radio, print (newspapers, articles in newspapers, magazines, scientific articles), social media (Facebook, YouTube, Twitter, LinkedIn).

Evidence of success: Availability of a written strategic communication document, use of a two-way communication model, effective use of both traditional and new media, engaging social media content.

THE CASE STUDY

Sustainable forest management has a vital role to play in countering global challenges such as climate change, food insecurity, water scarcity, and rapid urbanization. Communication about forest science is therefore increasingly necessary to promote the uptake of existing sustainable forest management practices as well as new ones (Kaul et al., 2020). However, national and international policies are poorly understood and constantly changing. Local forest managers and communities may also be insufficiently aware of existing and new policies and practices to be able to adopt pro-environmental behaviour (Shafqat and Fong, 2020).

Forest science communication involves stakeholders operating in different contexts and using different channels to communicate with their audience. Stakeholders in forest science communication include researchers, professional organizations, foundations, ENGOs, policymakers, and the public.

ENGOs are the most active at the community level (Shafqat and Fong, 2020). Key actors in forest science communication for social change, they have the ability to advocate for sustainable forest management and policy beyond established national structures and channels; they can unlock barriers that characterize national bureaucratic decision-making settings (Nulman and Özkula, 2016).

Studies portray ENGOs as effective knowledge producers, with their most common role being that of knowledge brokers or intermediaries between forest science knowledge producers and uptake by communities (Cochrane and Singh, 2017). ENGOs can effectively perform this intermediary role through strategic communication – purposeful and persuasive communication on behalf of an ENGO or project that can help to raise awareness and increase support for the ENGO’s mission or project outcome (Brorsson, 2022). Strategic communication can also help to shape and maintain the ENGO’s reputation locally, nationally, and internationally. For their part, media play an important role in strategic communication by helping ENGOs engage with their target audience.

The objective of this case study was to understand and describe communication strategies and media used in communicating forest science by two highly reputable ENGOs in Cameroon:

- **The Environment and Rural Development Foundation (ERuDeF)**, an award-winning and leading non-profit organization, was founded in 1999. With a mission to save the rainforest, conserve species, and impact lives, it has made significant contributions towards restoration of fragile ecosystems, forest regeneration through tree planting and agroforestry, biodiversity conservation through habitat protection, and protected area management. ERuDeF promotes environmental education and rural community empowerment through innovative economic and sustainable finances.

Headquarters: Buea, Southwest region of Cameroon

Language of communication: English

- **Forêts et Développement Rural (FODER)**, is an international non-profit environmental organization founded in 2002. Its mission is to create a conducive environment for sustainable development by implementing actions to guarantee justice and equity, good governance, transparent management, participation and sustainable natural resource management, biodiversity conservation, and improve human and environmental well-being.

Headquarters: Yaoundé, Cameroon; also working in other francophone African countries such as Côte d'Ivoire, Central African Republic, and the Republic of Congo.

Language of communication: Internal communication is mainly French, external communication is in French and English.

The World Bank classifies NGOs into two categories: advocacy NGOs focused on research and raising awareness, and operational NGOs managing development projects and humanitarian aid. Promoting sustainable natural resource management, ERuDeF and FODER are both advocacy and operational NGOs.

The case study responded to the following questions:

- What type of information is being communicated?
- What channels and tools were used in communication in relation to stakeholders?
- Are ENGOs using newly developed media?
- What media was most effective in engaging forest science stakeholders?
- What can be done to improve forest science communication within these organizations?

Data collection was performed through face-to-face and phone interviews with the coordinator and administrative officer of ERuDeF and the communication officer for FODER, in February 2024. Interviews were open-ended and supported by guided questionnaires. Phone interviews used WhatsApp. Interviews lasted about two hours.

Communication strategies are plans for communicating information of a specific issue, event, or situation to a selected audience. They help to communicate with the public, stakeholders, or colleagues and can be intuitive or exist in the form of a formal written document. In strategic communication of forest science, ENGOs are expected to have a formal strategy to effectively convey key messages and ensure that all stakeholders are engaged. However, this study found that ERuDeF's approach to strategic communication is intuitive: it does not possess any written communication document. Communication plans are developed for specific projects. FODER, on the other hand, has a well-written strategic communication document with a far-sighted communication vision as well as monitoring tools. It is an important organizational document with restricted access to non-members. FODER also develops specific communication plans per project that are informed by the communication strategy.

NGOs can adopt one-way or two-way communication. One-way communication is not very effective for NGOs that wish to follow a communication for social change approach.

Interviews with NGOs officials in this study reveal that both ERuDeF and FODER use two-way communication and have adopted a hybrid

system of communicating forest science involving both traditional and new media channels.

Traditional media are those that existed before the internet. Some advantages are that they have existed for some time, and are trusted. Both ENGOs have used a range of traditional media.

Radio

Since ERuDeF mainly works with local and Indigenous Peoples, it partners with a local radio station, *Menji Community Radio*, in one project area. This helps it to sensitize and educate the local community about protected areas, threatened species, and project activities. FODER applies a similar strategy. It partners with local radio to inform the local public about their projects. Given their regional portfolio, they have expanded their audience by making use of online radio stations. To capture a global audience, they report about their projects through international radio stations such as *Radio France International (RFI Monde)*.

Print Media (ERuDeF)

- **Newspapers:** ERuDeF publishes *The Green Vision Newspaper*, which they launched in 2013. The earliest editions were in hard copy but, with the arrival of ICT, both electronic and physical versions are now produced for the public.
- **Newsletters:** ERuDeF produces two different newsletters used to inform key stakeholders: *ERUDEF Institute Newsletter* and *Alliance for African Great Apes Newsletter*. The latter is published monthly and donated or sent online to stakeholders such as funders, policymakers, embassies, other NGOs, and researchers who subscribe to the mailing list.
- **Magazines:** The *Protected Area Magazine* published yearly by ERuDeF since 2021 highlights Cameroon's protected areas and ecotourism potential to foster sustainable forest management. ERuDeF's *Impact Magazine* is produced yearly to raise the profile of its impacts and achievements. Generally magazines

are produced principally for embassies, funding organizations, and researchers.

- **Scientific articles:** ERuDeF publishes its forest research findings in international journals with researchers as the main target audience. ERuDeF has published articles in the journal *Food Security* and the *Open Access Library* journal.

Print Media - FODER

FODER produces information leaflets, magazines, policy briefs, brochures, and other publications in both electronic and hard copies when the need arises. These are destined for a wide range of stakeholders – key stakeholders and the general public. FODER does not produce its own newspapers but contributes articles about the environment to national newspapers such as the *Cameroon Tribune*, *Le Messenger*, and *Nouvelle Expression*.

Interpersonal Communication Channels

These are also traditional communication channels, and both organizations engage key audiences face to face at conferences, workshops, and other events bolstered by materials such as pull-up banners, t-shirts, cartoons, pictures, and stickers to improve project visibility.

New Media (Social Media)

Social media tools play a strategic and important role in the ability to send out information, raise awareness, and communicate directly with engaged stakeholders. Both ERuDeF and FODER are exploring social media tools in their communication strategies. Both have websites and are actively using multiple platforms.

- ERuDeF created its Facebook account on 18 July 2013 and has received 1.6K likes and 1.6K followers. Its YouTube account was created in about 2020 and has attracted 48 subscribers with 23 videos. Its LinkedIn account has 397 followers, its Instagram 119 followers. It has a website and does some tweeting and blogging.

- FODER’s Facebook page was created on 19 March 2014 and currently has 4.4K likes and 5K followers. Its Twitter (X) account has 670 followers, YouTube has 190 subscribers and 139 videos, and LinkedIn 199 followers.

Neither NGO has started using newer media such as podcasts, FEEDS, Flickr, or Widgets due to lack of awareness and absence of trained staff.

LESSONS LEARNED

- Studies show that it is good to communicate forest science with simple language to improve understanding by stakeholders and increase support and participation in issues. However, it is also good practice to use some technical terms to reduce vagueness.
- Content analysis of the ENGOs’ traditional and new media tools revealed good use of technical terms such as endangered species, protected areas, land restoration, and deforestation. The ENGOs also promoted global forest-related agendas such as the UN Decade on Ecosystem Restoration, the Sustainable Development Goals, and the UN Framework Convention on Climate Change.
- Another important lesson learned was about the content promoted on social media. Both ENGOs communicated regularly about their projects and job openings. For both, Facebook stands out as the most popular social media tool. FODER, however, has engaged a wider audience than ERuDeF, possibly because of the way content is written and promoted, and the use of different languages.
- Both ENGOs highlighted lack of financial and human resources as principal challenges of effective communication of forest science. ERuDeF does not have a communication expert. FODER has long seen the need: its communication expert has been part of the team for close to ten years, and initiated the communication strategy.
- Both organizations have succeeded in juggling multiple communication channels to ensure that appropriate tools are used to meet the needs of different stakeholders (Dumetrica, 2022).

- There is a need to devise new tactics to increase audiences on platforms such as LinkedIn and YouTube.
- Given that social media is evolving, and new tools are being developed, FODER's current communication strategy could consider new media, for example podcasts.
- For ERuDeF, the absence of a written communication strategy and trained staff members in communications are serious limitations to their growth in forest science communication. There is a need for the organization to direct funds to forest-related communication.
- ENGOS that are planning to develop their communication can be inspired by the approach adopted by ERuDeF and FODER, which has positioned them among the leading ENGOS in Cameroon.
- Both ENGOS are performing well in forest science communication, but neither should be completely satisfied with the status quo and relax at this time.

Additional resources and references

Brorsson, E.B. (2022) A non-governmental organization's communication for social change: a qualitative case study of Kvinna till Kvinna. Thesis. <http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1696801&dswid=2408> (accessed 16 July 2024).

Cochrane, L., and Singh, R. (2017) Climate services for resilience: the changing roles of NGOs in Ethiopia climate services for resilience – Ethiopia 2 Contents. https://www.researchgate.net/publication/322734941_Climate_services_for_resilience_the_changing_roles_of_NGOs_in_Ethiopia_Climate_services_for_resilience (accessed 24 July 2024).

Dumetrica, D. (2022) Integrating social media in NGO strategic communication: lessons from Dutch NGOs' communication practices. In: Sorce, G. (ed.). *Global Perspectives on NGO Communication for Social Change*. (pp. 73–85). Routledge Taylor and Francis Group. <https://library.oapen.org/bitstream/id/e9d3c0a3-31e9-47ee-ba29-59858f9abc2e/9781000474923.pdf> (accessed 11 March 2024).

- Kaul, L., Schrögel, P., and Humm, C. (2020) Environmental science communication for a young audience: a case study on the #EarthOvershootDay campaign on YouTube. *Frontiers in Communication*, 5. (Also available at <https://doi.org/10.3389/fcomm.2020.601177>, accessed 16 July 2024.
- Nulman, E., and Özkula, S.M. (2016) Environmental nongovernmental organizations' digital media practices toward environmental sustainability and implications for informational governance. *Current Opinion in Environmental Sustainability*, 18, 10–16. doi: [10.1016/j.cosust.2015.04.004](https://doi.org/10.1016/j.cosust.2015.04.004)
- Shafqat, B.Z., and Fong, Y.L (2020) Climate change communication and the use of Facebook by non-governmental organisations: a case study in Malaysia. *Journal of Sustainability Science and Management*, 15, 147–163. (Also available at <https://jssm.umt.edu.my/wp-content/uploads/2020/10/13-V15V7.pdf>, accessed 16 July.)

CASE STUDY 8: TREES4ALL: PUBLIC ENGAGEMENT, MONITORING, AND OUTCOME REPORTING FOR DIVERSIFIED TREE FARMING

Imae Ann Mojado, Communication and
Engagement Manager

Mary Ann Llanza, Director Knowledge
Management, IT and Strategic Communication

Nitchanun Tantapong, Communication Officer

Rachana Chettri, Editorial and Publishing Officer

RECOFTC

Period: February 2022–December 2025

Problem: As an agricultural practice, monocropping leads to the deterioration of ecosystems. Ultimately, it benefits neither the environment nor the farmer. However, the operational costs of monocropping are lower in the short term. Also, for smallholder farmers already engaged in the practice, transitioning to diversified tree farming poses many challenges. Without post-planting care and monitoring, tree survival rates are low. Without means and channels to track outcomes, there is no transparency and little public engagement. Without tracking and communication, the resultant lack of confidence among sponsors leads to funding issues, which affect farmers' ability to successfully transition from monocropping into diversified tree farming. It is a downward spiral that needs to be fixed.

Communication instruments used: The Trees4All project carried out targeted communication that made reporting of the progress, outcomes, and long-term benefits of farmer engagement in tree planting and care accessible and available to individual and corporate sponsors. Communication instruments used included a website, an app, digital content, social media campaigns, print media materials, events, and collaborations with project and media partners.

Evidence of success: The increased buy-in and awareness, and amplified public support of the project, in turn ensured funding and project sustainability. Farmers are encouraged by this to continue and increase their involvement in diversified tree farming for sustainable livelihoods and restored forest ecosystems.

THE CASE STUDY

Communication is at the heart of Trees4All. RECOFTC had to present a convincing case for the economic feasibility of planting and caring for trees to farmers in Santi Suk District, Nan Province, Thailand. The Nan River contributes to the Chao Phraya River, one of the most important river basins. At the same time, the NGO had to collate and communicate evidence to convince individuals and groups interested in environmental stewardship and tree sponsorship that the Trees4All model, which involves caring for trees after they are planted, is sustainable.

Trees4All is built around collaboration and communication. Farmers receive funds from individual and business donors to plant, care for, and report on trees. Communication links all the stakeholders.

Farmers plant and nurture one tree for every USD 2.58 received. For the first three years, which cover the most crucial period for tree survival, farmers also measure growth, and collect and report data that they then upload to the Trees4All app. RECOFTC verifies the tree data and makes it accessible to sponsors and the public.

Trees4All has raised over USD 44,000 dollars so far. Ninety-nine farmers have signed up, planting and caring for 12,200 trees. The number of trees planted almost doubled during the 2023 rainy season – from 4,200 in 2022 to 8,000. RECOFTC already has funds

in place to plant 3,700 more trees this year, and the donations keep coming.

Communications were designed and delivered at multiple levels, following three main communication tracks: project to farmer, farmer to tree sponsor, and project to public.

Messaging to farmers needed to address economic feasibility concerns. The messages helped them understand that tree planting, monitoring, and reporting would be viable and offer them additional sources of income in the long term. Once this was done, the communication contacted potential sponsors with tailored messages that would speak directly to them.

To build trust among current and potential sponsors, RECOFTC trained farmers on how to accurately report tree growth and the progress of their trees directly to trees4allthailand.org.

We developed an app that would be accessible to farmers even offline, and verified the data. We aided the farmers' digital literacy by developing an app user manual and encouraged farmers to contact the Trees4All project coordinator for questions. For tree sponsors, we have FAQs, videos, and infographics with a comprehensive introduction to the Trees4All website and a guide on how to log in and view information on the growth of their trees.

With the promise of financing through crowdfunding and transparent reporting, we were able to build trust between farmers and sponsors. We will continue to tell success stories on social media and related websites, communicating the project's impact on the farmers and the environment.

The success of Trees4All relies on information dissemination and exchange that connect science and society. Its communications have made scientific evidence accessible, reaching two distinct non-scientific audience groups - farmers and sponsors - to meet two principal objectives, securing crowdfunding and reporting tree-planting outcomes.

Securing Crowdfunding

[Taejai.com](https://www.taejai.com) is the crowdfunding platform and donation channel. All promotional materials on social media link to this site, where sponsors can read further about the project and directly make donations.

Both RECOFTC and Taejai.com ensure continuous online engagement, including periodic boosted posts on Facebook, to highlight what sets Trees4All apart from other tree-planting initiatives. Striking visual images, often photographs of farmers in the field tending to and monitoring their trees, are used to create a connection that resonates with our audience.

Trees4All partners with environmental content creators to amplify reach. In 2023, its collaborator KongGreenGreen, which has 180,000 followers on Facebook and a further 270,000 on TikTok, produced a short video featuring farmers tending to their trees and collecting data. Within a week of sharing, we received USD 2,700 dollars in donations, which has gone into the planting and caring of almost 1,100 trees.

Trees4All's targeted campaigns recognize the importance of timing for effective message dissemination. During the Christmas and New Year period, traditionally a time for giving in Thailand, it launched campaigns to promote Trees4All and encourage donations. In 2022, we collaborated with Tellscore, a Thai influencer agency, and engaged 100 micro-influencers. These influencers shared Trees4All's content with their combined Facebook following of over 470,000, resulting in significant organic exposure for our initiative. Around USD 1,400 dollars was raised, enough to cover the planting and care of over 500 trees.

Event participation and print materials have also played a part in boosting visibility and reaching potential sponsors. For events, in addition to the standard brochure and information materials, Trees4All has photo backdrops and handheld photo props. These spark interest among event attendees, creating photo opportunities that encourage public engagement and motivate them to share

Trees4All content on social media. QR codes on printed materials lead to the donation channel.

Tree-planting Outcome Reporting

Trees4All ensures that scientific data is presented in an accessible online format. The updates that farmers input via their phone app are reported on the project website, trees4allthailand.org.

On its homepage, visitors can find key information such as the total amount of donations received, the total number of donation transactions, the number of trees planted, the tree survival rate, the number of participating farmers, the estimated amount of potential oxygen release, and the estimated potential carbon sequestration, which is calculated after trees reach a specific height and girth. Additionally, a tree map, along with the names and photos of participating farmers, is available for viewing.

Tree sponsors can log in and view these details as well as access geographic coordinates, species names, tree photos, health scores, and planter's names. Detailed information is available for download in PDF format, providing business owners with tangible evidence of their contributions to sustainability.

In collaboration with Kasetsart University's Faculty of Forestry, the project innovated further, developing a tree health score system that is easy to understand. Tree health is assessed on a scale of 0 to 3, reflecting the condition of the saplings' leaves. A score of 0 indicates a dead sapling, which the farmer then replaces. A score of 1 indicates poor condition with yellow leaves, a score of 2 indicates a partially healthy condition, a score of 3 indicates a healthy sapling.

On the project site the tree map provides a visual representation of tree locations, providing tree sponsors with a clearer understanding of where their trees are planted, offering a more intuitive guide than geographic coordinates. This combination of tangible evidence, numerical data (such as estimated potential carbon sequestration), and personal narratives helps sponsors realize the impact of their contributions.

The Trees4All project website provides concrete scientific information, while the RECOFTC website and Facebook pages highlight human stories. These platforms feature updates, photos, and stories that offer stakeholder insights. Through this approach, it presents a diverse range of viewpoints to its audience, enhancing the project's credibility.

Tress4All also engages in live events, which help to report outcomes and build trust. Staff organized events attended by tree sponsors, content creators, and journalists, where they participated in tree planting and observed tree tracking first-hand.

LESSONS LEARNED

- To effectively communicate complex forest science to non-experts, Trees4All needed to simplify data interpretation and reporting while ensuring data accuracy.
- Reports and longer articles are valuable for audiences aiming to gain deeper insights into the project.
- Short videos and colourful artworks with bite-sized information help grab attention in an era of information overload. They effectively convey key messages to mass audiences.
- For greater digital reach, it is worthwhile partnering with experienced content creators with significant followings to tell and share authentic Trees4All stories. Such partnerships have amplified reach, creating a deeper understanding of the mission.
- The casual and relatable tone of social media communications reinforces the long-term benefits for farmers, society, and the environment in the audience's minds.
- The personal stories of farmers and tree sponsors are particularly powerful, inspiring, and motivating others to support the project.
- Live events foster a deeper level of trust among sponsors.
- Photographs, videos, and posts generated from field visits lead to increased media coverage opportunities.

For more information

RECOFTC's work is made possible with the support of the Swiss Agency for Development and Cooperation and the Government of Sweden. Financial support for Trees4All comes from the Global EbA Fund and Wyss Academy for Nature. Through the crowdfunding channel, support for the project has come from over 1,700 individuals so far. Trees4All is implemented with project partners Kasetsart University Faculty of Forestry, ChangeFusion, and the Trees4All community-based enterprise.

- RECOFTC website: <https://www.recoftc.org/> (accessed 18 July 2024).
- RECOFTC Facebook: <https://www.facebook.com/recoftc/> (accessed 18 July 2024).
- RECOFTC Thailand Facebook: <https://www.facebook.com/recoftcinThailand/> (accessed 18 July 2024).
- Trees4All project website: <https://trees4allthailand.org/> (accessed 18 July 2024).
- Trees4All crowdfunding page: <https://taejai.com/th/d/tree-for-all/> (accessed 18 July 2024).

CASE STUDY 9: **A NEW WAVE OF FOREST COMMUNICATION IN ITALY: HOW AN ACADEMIC ORGANIZATION TURNED ITSELF INTO A POPULAR RESOURCE FOR ORDINARY PEOPLE**

Giorgio Vacchiano, Associate Professor of Forest Management and Planning, University of Milan, Italy; Italian Society for Silviculture and Forest Ecology (SISEF)

Period: 2019–2024

Problem: In 2018 the new Italian forest law, the Vaia storm, and increasing attention to climate change, suddenly brought forests under the spotlight. People from all walks of life wanted to know whether forests were threatened and how they could be helped. Without an authoritative and credible voice, forest communication became immediately polarized, especially on social media. Environmental NGOs and economic interest groups were spreading misinformation on forest threats, forest area trends, the effects of forest management, and the power of tree planting. At the same time, the entity most qualified to communicate forest science, the Italian Society for Silviculture and Forest Ecology (SISEF) was communicating almost exclusively to academic circles. There was an acute communication gap.

Communication instruments used: a communication working group, blogs, YouTube videos, a communication strategy, infographics, Instagram.

Evidence of success: Planned strategically by a communication working group within SISEF, large volumes of well-thought out and appealing communication on forests were successfully disseminated through social media. This resulted in Italy's august scientific forestry body becoming highly responsive, filling the information vacuum, and becoming the go-to place for all matters related to forests. Proof of how unmet needs for communication around forest science was met by SISEF includes visits to its website increasing from 5,000 in 2019 to more than 100,000 in 2022.

THE CASE STUDY

Founded in 1995, SISEF is Italy's national society for forest scientists and has over 150 active members. However, it traditionally communicated only within academia, with biennial scientific conferences and two scientific journals: Forest@ in Italian and English, and iForest in English, an ISI-ranked journal.

Aware of the urgent need of media and citizens for more communication on forest science than they were getting, SISEF set up a working group in 2019 to position itself as a credible information source. The communication working group designed a three-year communication strategy detailing the main messages, targets, media, and how this would interact with the scientific communication framework in Italy, which itself was underdeveloped.

Several initiatives were launched between 2019 and 2023, including:

- Io foResto a casa (iForest at home), 50 YouTube videos shot during the COVID lockdowns with forest scientists and professionals reading their favourite forest-related literature excerpts;
- Focus Incendi, 20 blogs over two consecutive summers popularizing concepts of fire prevention and forest fire ecology;
- Forest science pills, 50+ blog posts popularizing the most recent scientific results of forest-related research;

- SeDici Foresta, 16 infographics illustrating the main results of the latest National Forest Inventory;
- FrameYourResearch, 15 short videos with early career scientists summarizing scientific posters presented at the 2022 SISEF National Congress in Orvieto TR);
- Outputs on *Forest food* and *Focus on wood*.

The posts were published on SISEF's website/blog, visits to which increased twenty-fold, and reposted on SISEF's Facebook page, which today has 7,500 followers, and on SISEF's Twitter/X, which today has 250 followers. Instagram profiles were launched in 2024.

These initiatives contributed to position SISEF as the most credible scientific source for all things related to forests in Italy. This led to a strong increase in media exposure and interviews: SISEF members frequently appear on national news and regularly collaborate with the main documentary programmes and scientific/environmental broadcasts and newspapers. It also led to collaborations with NGOs such as Greenpeace and WWF, which have traditionally been quite hostile to forest management. SISEF was among the three finalists of the 2021 National Scientific dissemination prize.

In 2024, SISEF is updating its communication strategy, based on lessons learned in the past four years of activity. A formal monitoring of the impact of these actions is still to be conducted, and SISEF has not yet carried out structured surveys or monitored the penetration of its news across all media. However, the impact of this new wave of forest communication can be clearly felt across country. After four years, many of the messages that SISEF decided to focus on are now part of the common knowledge of the media and of many, if not most, citizens.

These include:

- Forests are linked to the well-being of all citizens.
- The forest area in Europe is increasing.
- Tree planting is not a silver bullet.
- Forest fires are heavily related to climate change, not only to arsonists.
- Sustainable wood use is a tool for climate change mitigation.

- Forests can and should be sustainably managed and planned.
- Urban trees protect cities and their residents from heatwaves, pollution, and heavy rains.

LESSONS LEARNED

The ten most important lessons SISEF learned were:

- Build trust and credibility as a basis for communication.
- Do not engage in arguments especially on social media; do not succumb to the urge to engage with or counter all fake news. Instead, follow a strategy of constructive and fact-based communication, accompanied by a few well-chosen pieces that debunk or pre-bunk widespread misconceptions or misinformation.
- Engage audiences outside the bubble of forest-minded people in creative ways, partnering with the worlds of arts, sports, literature, food, or cinema, to reach wide audiences interested in these activities.
- Be proactive in reaching journalists and media: propose topics for a piece or interview, write for newspapers, maintain a constant and trustworthy presence on social media.
- To build networks and enlarge your audience, share, repost, or retweet information from other accounts that is consistent with your communication profile.
- Build a recognizable identity, including branding/graphics: entrust communication to the same voices and speakers.
- Do not shy away from, but rather embrace an empathic approach to communication, using emotions wisely to create feelings of connection and hope, and a sense of actionability. Positive emotions are more effective than negative ones in changing behaviour.
- Identify and address communication preferentially to effective multipliers of messages, such as journalists, teachers, and influencers (individuals or media pages).
- Accept the pain of 'dumbing down' scientific language, using metaphors, and simplifying arguments a little more than a scientist is normally comfortable with.

- Build an extensive network of experts with which to share and redirect communication opportunities. Media require a quick response: the more people you are in touch with, the easier it is to answer promptly and exchange advice and data to support claims. Get frequent feedback on language and communication methods used. Besides improving the efficacy of communication and giving listeners the impression of a cohesive and vibrant scientific community, it also makes communicating more fun.

Additional resources and references

Specific communication activities were also developed by Compagnia delle Foreste, a publishing house based in Arezzo that specializes in forest-related publications, magazines, and books, and has partnered with the SISEF communication working group to reach parts of the public well outside the usual audience of forest-minded people or professionals.

Successful activities included:

‘Fire-smart stories’ (<https://vimeo.com/manage/videos/809222543>): an international feature film written and directed by Davide Ascoli, forest ecologist at the University of Turin and SISEF, and Luigi Torreggiani, journalist at Compagnia delle Foreste. The film is a journey through innovations in fire prevention practices in Italy, Spain, and Portugal. The featured experiences are capable of creating fire-resilient landscapes while improving local economies, job opportunities, and biodiversity in rural territories. The documentary collects the voices of 22 local actors who tell stories from ‘fire-smart’ practices, which can be replicated in other contexts and teach us how useful and necessary it is to combat the abandonment of rural territories. There are stories of adaptation, in a climate that is changing dramatically – stories of the future.

VAIA – Trees, Humans, Climate (<https://www.compagniadelleforeste.it/podcast/vaia-alberi-esseri-umani-clima.html>): a podcast in four episodes produced by Compagnia delle Foreste and the newspaper Domani, with the support of the Programme for the Endorsement

of Forest Certification (PEFC) Italy, Unione Nazionale Comuni Comunità Enti Montani (UNCCEM) and FSC Italy, written and narrated by Ferdinando Cotugno and Luigi Torreggiani, the creators and hosts of Ecotoni, the podcast dedicated to Italian forests. In this vocal reportage from the places of the Vaia storm, the two authors interview 20 witnesses and experts, talk about the night of the disaster and everything that came after, starting from bark beetle outbreaks that followed.

The podcast also describes the consequences of the storm on the forestry world and wood economy, a reality often at the margins of Italian economy and society. Finally, the podcast takes a look at the future: what is needed to make such an important, delicate, and fragile part of our territory more resilient to the climate crisis, using the storm as an opportunity to rethink the Italian woods and mountain territories of tomorrow? The podcast has now more than 10,000 downloads.

May Contain Traces of Forests (<https://www.floornature.com/design-trends/forests-are-amongst-us-17686/>): an exhibition at the Circolo del Design, Turin, that reveals the profound connection between nature and people, dissolving the illusion that the forest is far from our urban world. The exhibition, curated by the forest researcher Giorgio Vacchiano and the designer Elisabetta Donati De Conti, invited visitors not to just look at the objects on display but to also appreciate their beauty. The aim was to mend the cultural gap that exists between the contemplation of the forest environment and the objects that derive from it – or at least to raise questions about this gap and bring these two worlds, the forest ecosystem and production/design, closer together in the cultural imagination.

The exhibition followed a clear and defined path, starting with a description of the forest and its study, through measurement tools, analysis materials, and sampling. The transition from research to the designers' experiments was marked by a section dedicated to 'everyday objects' produced on a maxi-industrial scale, such as paper, cardboard, toilet paper, glass, viscose spools, soaps, bubble baths, oil essences, and others.

The second part of the exhibition focused attention on the research and experimental work of national and international designers, presenting works that brought the public closer to the topic and highlighted the limits and characteristics of forest materials. The itinerary ended with speculative narratives that invited visitors to reflect on their own relationship with forest ecosystems.

The exhibition was an integral part of the festival *Earthrise - Design for a Living Planet*, an event developed over four days in June 2023 with talks, workshops, dialogues, and readings. This multidisciplinary approach provided citizens of all ages, including children, with the opportunity to explore and change their conception of the forest in relation to the topics covered. The festival events can be seen on YouTube (<https://www.youtube.com/playlist?list=PLntJZDIU-rQ9LklwfYHkVyutevQk4IPIs>); a podcast is also available which collects various curiosities about the exhibition and takes up the themes already discussed during the festival (<https://earthrise.it/en/podcast-en/>). The exhibition was visited by 1,540 people in six months.

The Larch Desk (<https://youtu.be/CuWro3XOwEI>): a short video dedicated to middle school students, to educate them on the themes of wood as a renewable material, forest planning, sustainable forest management, and energy from forest biomass, using a cascading approach. The video was produced as a communication output of the research project *Innovative approaches to evaluate the provision of ecosystem services by forests of Lombardy Region (Approcci innovativi per la valutazione della fornitura di servizi ecosistemici in foreste lombarde - USEFOL)*, financed by the Lombardy Region (www.usefol.it), with the objective of promoting the active, sustainable, and climate-smart management of Italian mountain forests.

The video is the representation of a dream that, starting from a simple desk, shows the upstream wood supply chain that led to the creation of the object, up to the sustainable management of the original forests. Young actors from the theatrical school of the Teatro Pedonale in Agrate Brianza were involved in the making of the

video – young people were chosen as the best subjects to talk about this topic to their peers, in a simple, relatable, and immediate way.

Discovering the forest: a series of illustrated books for elementary and middle schools. The forest can be transformed into a large open-air classroom! This is what the students of Professor Boschetti's class discover in the two short, illustrated stories of the *Discovering the Forest* series, produced by Compagnia delle Foreste thanks to the Evo Forest and LIFE SPAN projects. Accompanied by illustrations and simple teaching cards, these illustrated stories (in Italian) are easy to read, but at the same time represent a real teaching tool for use by teachers and 4th–5th grade and 1st grade classes; a real textbook, complete with suggestions and exercises to delve deeper into the topics in class.

The first story, *Discovering Forestry*, is an opportunity for boys and girls to meet the various figures who deal with sustainable forest management and learn that great 'art of balance' that is forestry.

The second story, *Discovering Biodiversity*, leads Professor Boschetti's class to discover why biodiversity is so important and how it is possible to reconcile the provision of useful ecosystem services for our society, including timber, with the protection of habitats and species at risk.

<https://www.compagniadelleforeste.it/pubblicazioni-cdf.html?download=60:alla-scoperta-della-selvicoltura>

<https://www.compagniadelleforeste.it/pubblicazioni-cdf.html?download=63:alla-scoperta-della-biodiversita>

Giro d'Italia forestale (<https://www.rivistasherwood.it/t/novita-e-notizie/giro-italia-forestale2023.html>): on the occasion of the 106th edition of the Giro d'Italia, Compagnia delle Foreste and SISEF, in collaboration with the web magazine *LifeGate*, published the *Giro Foreste d'Italia*, a set of four articles that tell, stage after stage and climb after climb, the stories of forests crossed by the Giro in a series of blog posts. The TV broadcasts of the Giro stages are famous in Italy and beyond for the beautiful landscapes and villages crossed by the bikers. This is why we believed that following the Giro could

also be an excellent way for sports fans to learn about the most unknown of our country's treasures: forests.

For more information:

- <https://sisef.org/>
- <https://www.facebook.com/SISEF-Societ%C3%A0-Italiana-di-Selvicoltura-ed-Ecologia-Forestale-306291402844708/>
- <https://twitter.com/SISEFtweet>
- <https://www.instagram.com/sisef.foreste/>
- https://www.youtube.com/playlist?list=PL_tta0EoHgaBg6Fwybyr_b5ncTI0MTIYJ
- <https://foresta.sisef.org/?lang=it> (Italian scientific journal)
- <https://iforest.sisef.org/> (English scientific journal)

