



# Science Communication (Outreach)

## Transitioning from Researcher to Outreach

- A broad definition of *outreach* as “any scientific communication that [directly] engages an audience outside of academia” (Poliakoff and Webb 2007, p. 244);
- *Definition for Effectiveness of Outreach* (recent definition from Fischhoff (2013)):

The goal of science communication is not agreement but more about building capacity, fostering mutual trust, and achieving a shared understanding of the relevant science.



Source: <https://www.sciencemag.org/careers/2010/04/transitioning-researcher-outreacher>

# Motivating Questions



1. Do we effectively communicate our research to society?
2. Does the public read our papers?
3. Does farmer/dam operator care about our boxplot, dendrogram, or NSE?
4. Can we deliver our research in a simpler and effective way?
5. How can we promote the use of science in policy making?
6. Is the language a barrier for understanding or applying research?



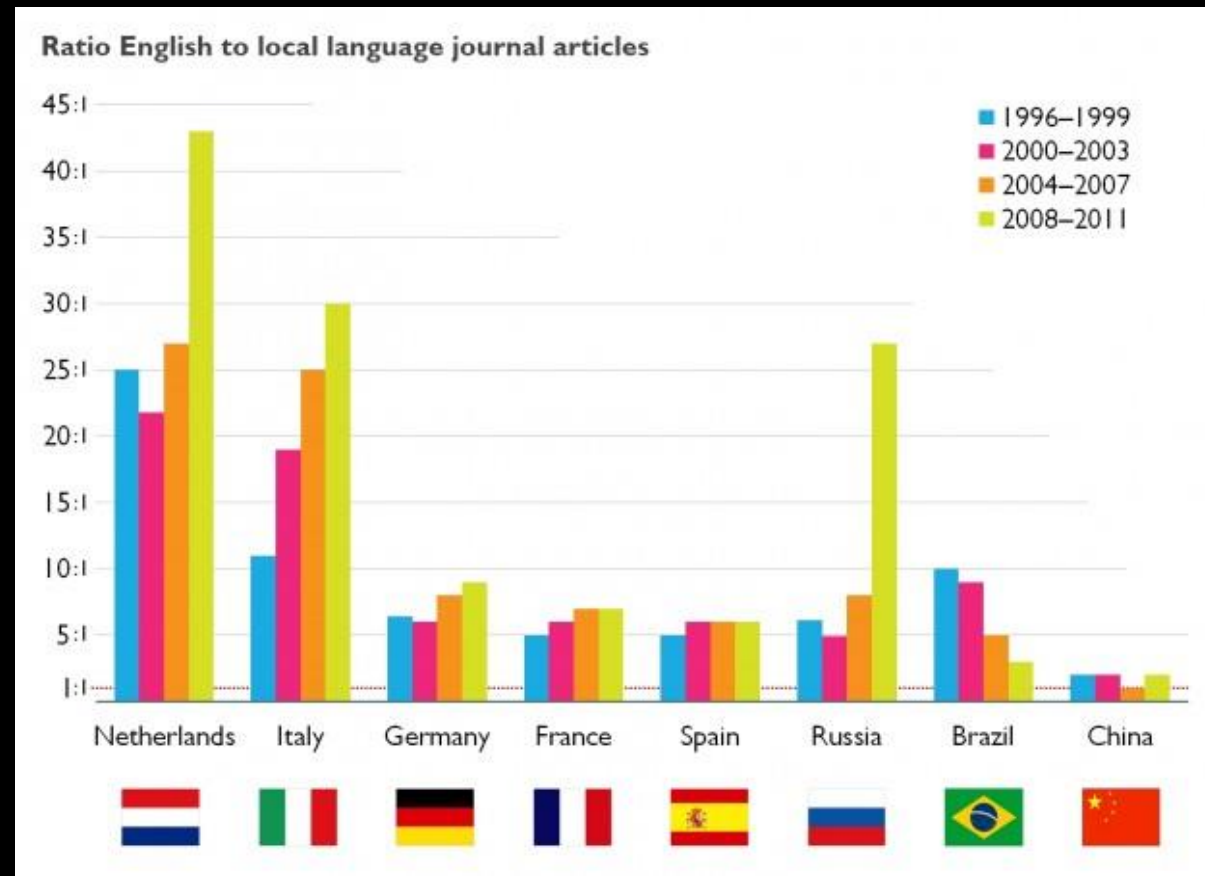
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# Research in English

- English is generally considered to be the lingua franca of the scientific community.
- Roughly 80% of all the journals indexed in Scopus are published in English.

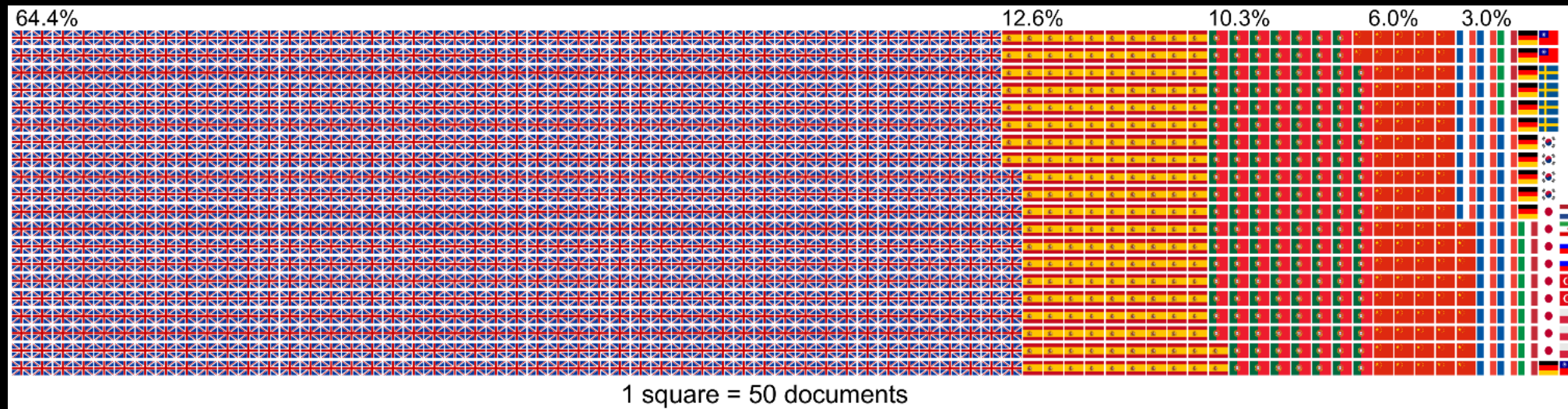


<https://www.researchtrends.com/issue-31-november-2012/the-language-of-future-scientific-communication/>



# Gap in Knowledge

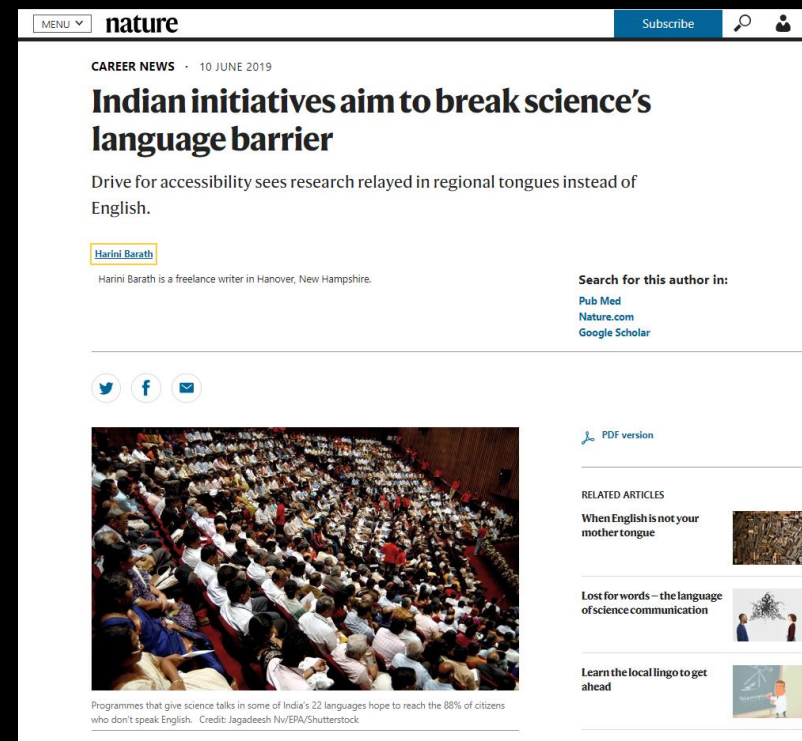
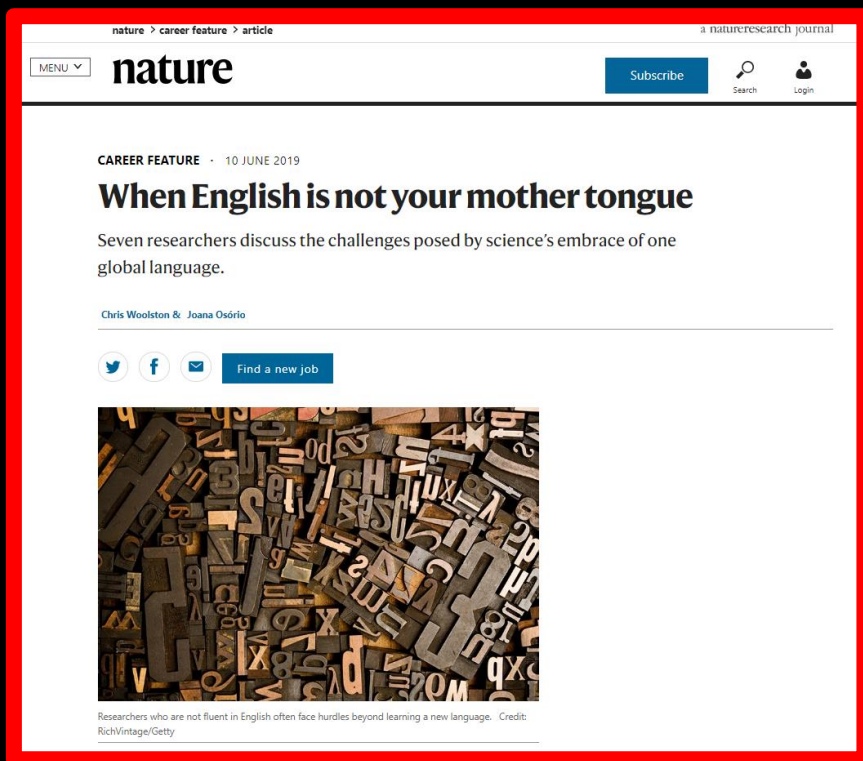
- How many papers are published in languages other than English?
- Gaps in information availability during the global compilation of scientific knowledge.



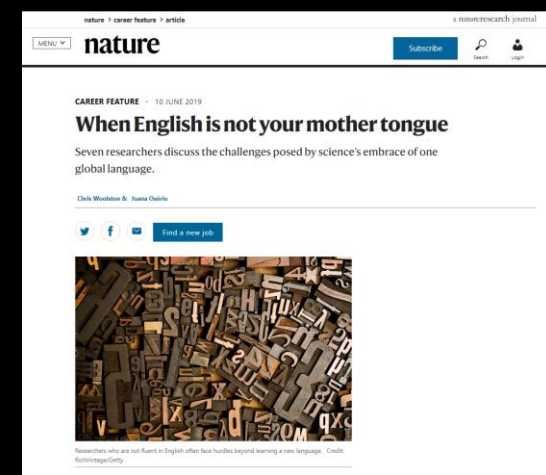
Waffle plot for scientific documents published in 2014 with two keywords, “biodiversity” and “conservation”, in 16 languages on Google Scholar generated 75,513 manuscripts, of which English was by far the most frequently used language (48,600 scientific documents, 64.4%), followed by Spanish (9,520), Portuguese (7,800), simplified Chinese (4,540), and French (2,290)

# Language Barrier

- Having a dominant language can streamline the process of science, but it also creates extra barriers and the potential for conflict.
- **Nature** asked seven researchers with personal or professional experience of language barriers to share their insights.



# Language Barrier



- YANGYANG CHENG (Physicist at Cornell University in Ithaca, New York):  
***“I don’t even know how I would give a talk about my work in Chinese. It would take a lot of effort.”***
- VERA SHERIDAN (Language and intercultural relations researcher at Dublin City University):  
***“Language support and translation services could be built into grants.”***  
***“English speakers have become the gatekeepers of science. By keeping those gates closed, we’re missing out on a lot of perspectives and a lot of good research.”***



# Language Barrier



- MICHAEL GORDIN (Professor of modern and contemporary history at Princeton University, New Jersey, and author of Scientific Babel (Univ. Chicago Press, 2015)):

***“In countries where English isn’t spoken, you shut out everyone but the well-educated. We could be losing some really smart minds.”***

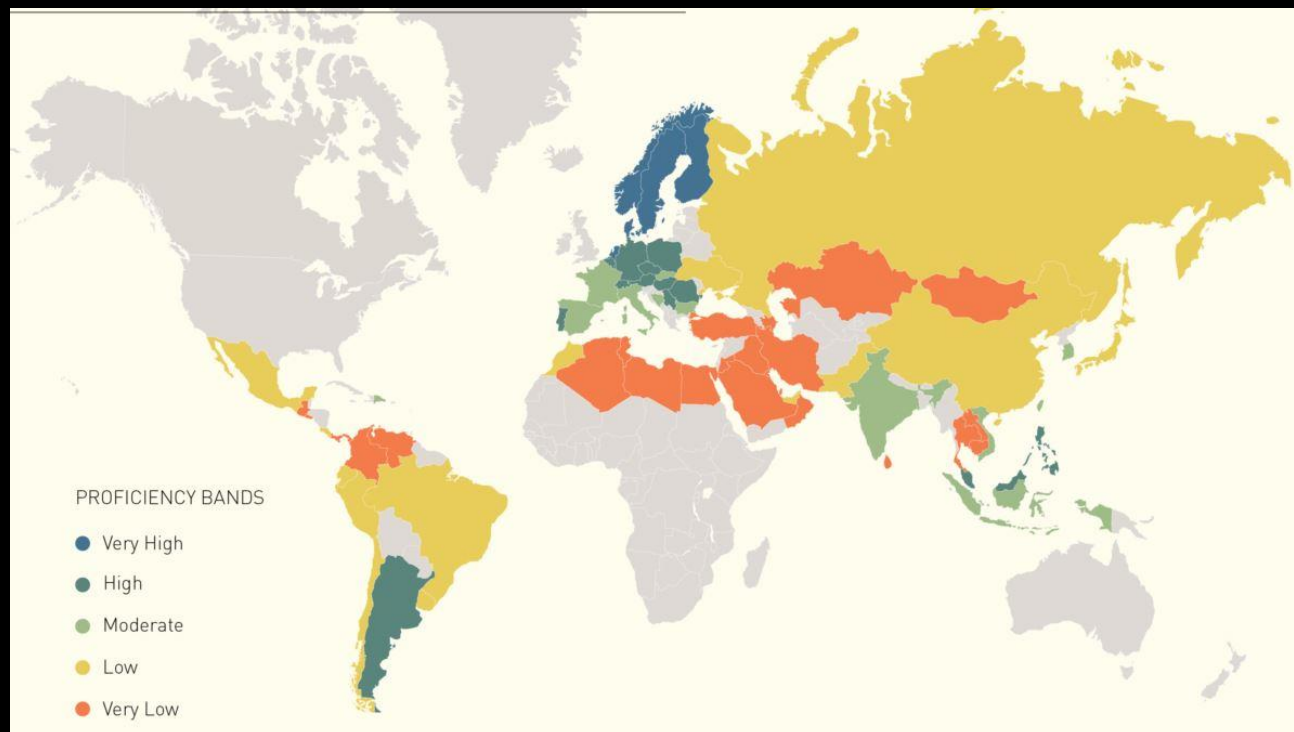
***“In the future — perhaps even in this century — science could split into three languages: English, Chinese and another language, such as Spanish, Portuguese or Arabic.”***

# Challenges

- More than 80% of research is available in English (Challenge for Public Engagement).




## *Low/very low English proficiency*

- Gap in scientific knowledge with non-English research (Challenge for Research).



EF English Proficiency Index (EF EPI) attempts to rank countries by the average level of English language skills amongst those adults who took the Education First (EF) test

# Solutions

- Asking public to learn English!  **Not Practical**
- Communicating Science in English  **Not Effective**
- Translating/Interpreting Research into Native Language 

# Healthcare Paradigm: Cross-Language Research

- A common practice by health care professionals/researcher
- **Cross-language** qualitative research occurs when a language barrier is present between researchers and participants.
- The language barrier is frequently mediated through the use of a translator or interpreter.
- The credentials of a person providing translation services are important.



Squires, A. (2009). Methodological challenges in cross-language qualitative research: A research review. *International journal of nursing studies*, 46(2), 277-287.

Temple B, Young A. Qualitative research and translation dilemmas. *Qualitative Research*. 2004;4 (2):161-78.





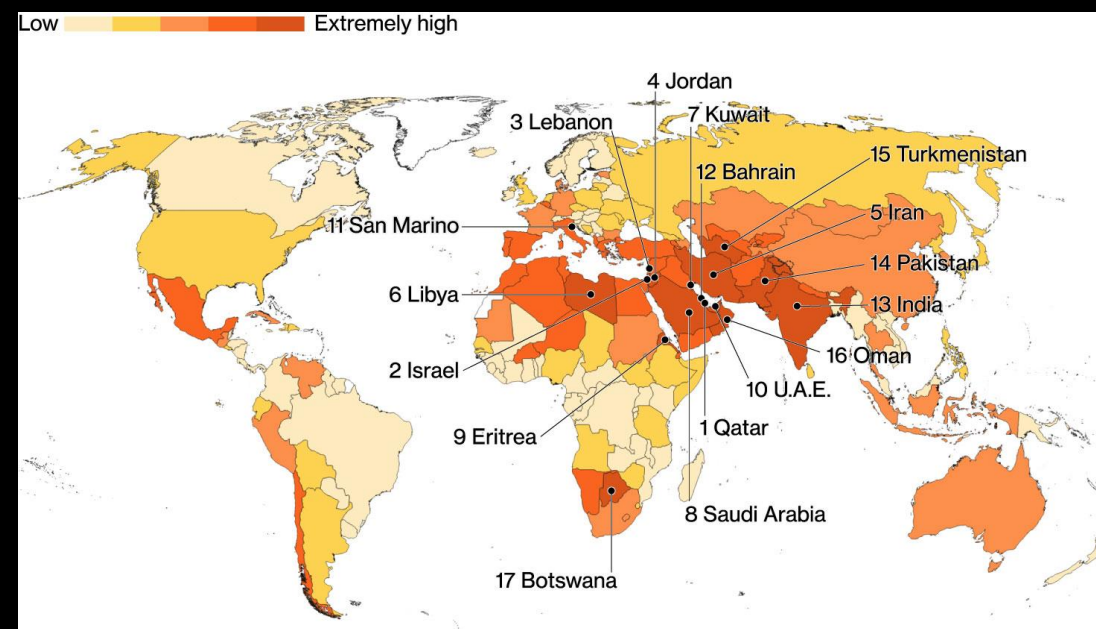
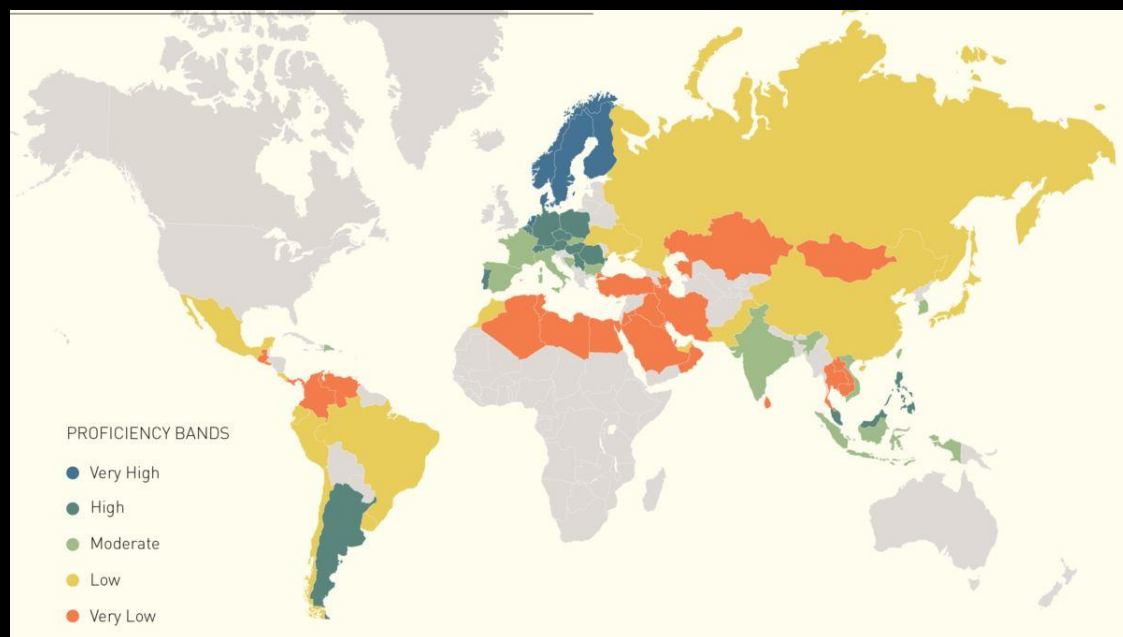
# HYDROLINGO

Deliver Water Research in Native Language

Towards Effective Public Engagement with Water Research

# Why Hydro?

- Our research area (maybe in the future: GeoLingo)
- Importance of water management with water scarcity issues
- Looking for Sustainable FEW system



Can we have a Hydrolingo index (Water Scarcity/English Proficiency)?

# Why Lingo?



# Why Lingo?

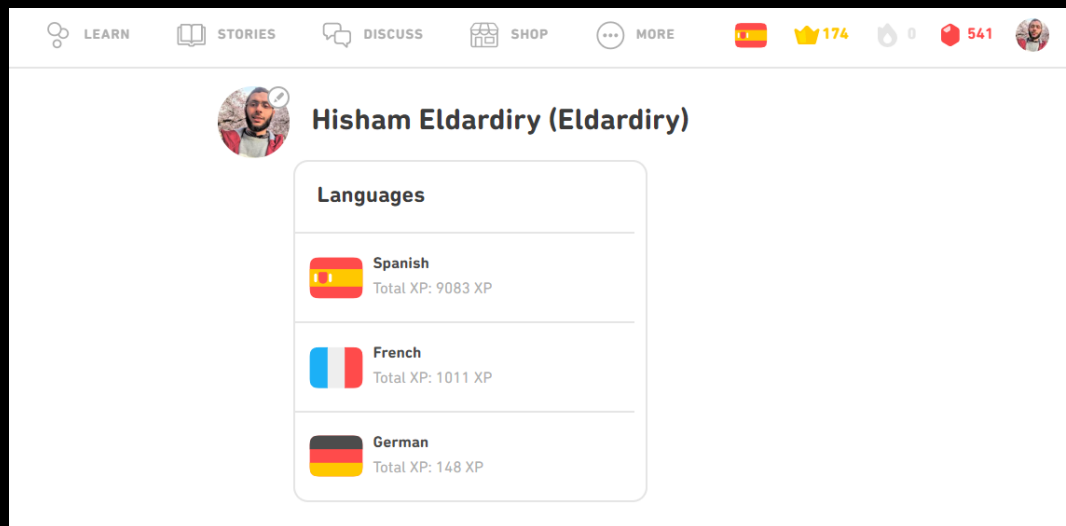


duolingo



# Why Lingo?

- Duolingo is an American platform that includes a language-learning website and mobile app.
- A digital language-proficiency assessment exam.
- The app and the website are accessible without charge.





# HydroLingo Vision



## Resources for outreach in your community

Craft an elevator pitch – For many scientists, one of the most terrifying questions they can get is “What do you do?” We can help you get your story straight.

Write a plain-language summary – While scientists often communicate with peers in jargon, abstracts help ensure research is accessible to non-scientists and can get your research noticed. Learn how to write a plain-language summary for your research.

Learn how to give a presentation – A complete guide for planning for, preparing your message, and giving a presentation in your community.

Speak without jargon – Words commonly used in your discipline might get in the way of your audience clearly understanding your science. Learn how to speak with simplicity and precision.

Have a conversation about climate change – A conversation about climate change that starts close to home can help influence the public perception of science and advance the dialogue around climate change. Learn how to talk about climate change.

Rehearse – Practice mock interviews with any audience using these questions developed by the Sharing Science program.

Reach out to a K-12 audience – Share your science message with a younger student audience to influence the next generation of scientists and citizens.

Request a Sharing Science Workshop – Would your organization benefit from a workshop on communicating to community groups? Contact us to learn more and schedule a workshop.



# HydroLingo Ambassadors

- The credentials in **Hydrolingo Ambassador** will be:
  - ✓ Being a researcher in water resources field (affiliated with university department or research institute)
  - ✓ Being a native speaker (to be able to translate/interpret)

## United Nations

- There are six official languages of the UN. These are Arabic, Chinese, English, French, Russian and Spanish.
- The correct interpretation and translation of these six languages, in both spoken and written form, is very important to the work of the Organization, because this enables clear and concise communication on issues of global importance.





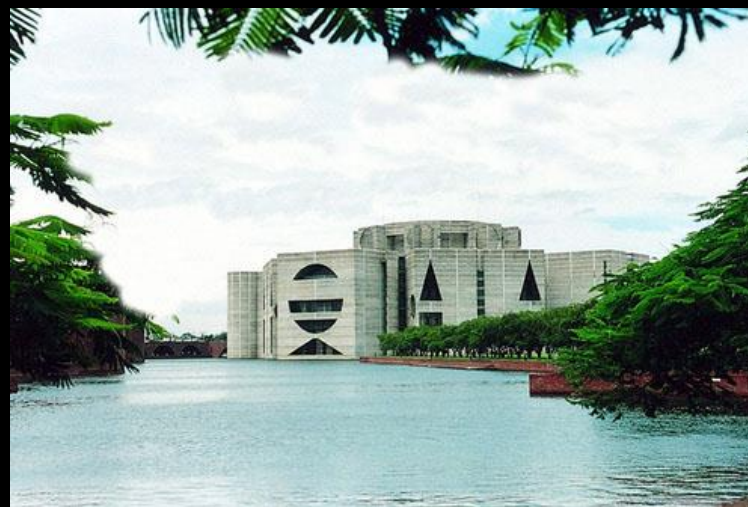
# HydroLingo Users

## Who can use HydroLingo?

- Water resources community

## Two Examples of Recent SASWE International Travels:

- ✓ Faisal visited Egypt
- ✓ Claire visited Bangladesh







# HydroLingo Users

## Examples of Tutorials in other Languages

- GEE tutorials
- SWOT Hackathon


<https://developers.google.com/earth-engine/ttt>

### Externally developed training materials

#### SERVIR-Mekong



The following training materials were developed in support of the [SERVIR-Mekong program](#) and include contributions from the [US Forest Service Geospatial Technology and Applications Center](#), [WinRock](#), and the [Spatial Informatics Group](#). These exercises and case studies have been used to teach Earth Engine in the Mekong basin and other areas to build geospatial capacity at regional institutions. They are intended to familiarize participants with the Earth Engine platform and basic methods for visualization, data creation, cloud masking and compositing.

#### English

 VietnamCaseStudy2	3/2/17 Earth Engine Team
 VietnamCaseStudy3	3/2/17 Earth Engine Team

#### Spanish

The Spanish versions were created by the [Spatial Informatics Group](#) with support from FAO's Analysis and Mapping of Impacts Under Climate Change for Adaptation and Food Security (AMICAF) program.

TITLE	LAST MODIFIED
 Exportación de datos.docx	8/14/17 Earth Engine Team
 Funciones personalizadas.docx	8/14/17 Earth Engine Team
 Funciones personalizadas.docx	8/14/17 Earth Engine Team

#### Vietnamese

The Vietnamese versions were created by [SERVIR-Mekong](#) in conjunction with the [Spatial Informatics Group](#) and the [University of San Francisco](#).

TITLE	LAST MODIFIED
 caseStudy1_VN.odt	8/14/17 Earth Engine Team
 caseStudy2_VN.odt	8/14/17 Earth Engine Team
 caseStudy3_VN.odt	8/14/17 Earth Engine Team

# Translation Platforms



A seven year filling by Ethiopia is minimally disruptive to operations of High Aswan Dam and recovery is fast.

## *Translate into Arabic*

تعطل إثيوبيا لمدة سبع سنوات إلى الحد الأدنى يعطل عمليات السد العالي في أسوان  
ويتعافى بسرعة.

## *Translate Back into English*

Ethiopia has been disrupted for a period of seven years to a minimum, disrupts High Dam operations in Aswan and is recovering quickly.



# Avoid Jargon



**HAD can operate under normal operating levels if GERD follows a 7-year Filling Scenario**



*Egyptian farmer, harvests wheat on his farm, in Qalubiyah, north Cairo, Egypt.*

**Filling the Ethiopian dam in 7 years will secure enough water for Egypt**

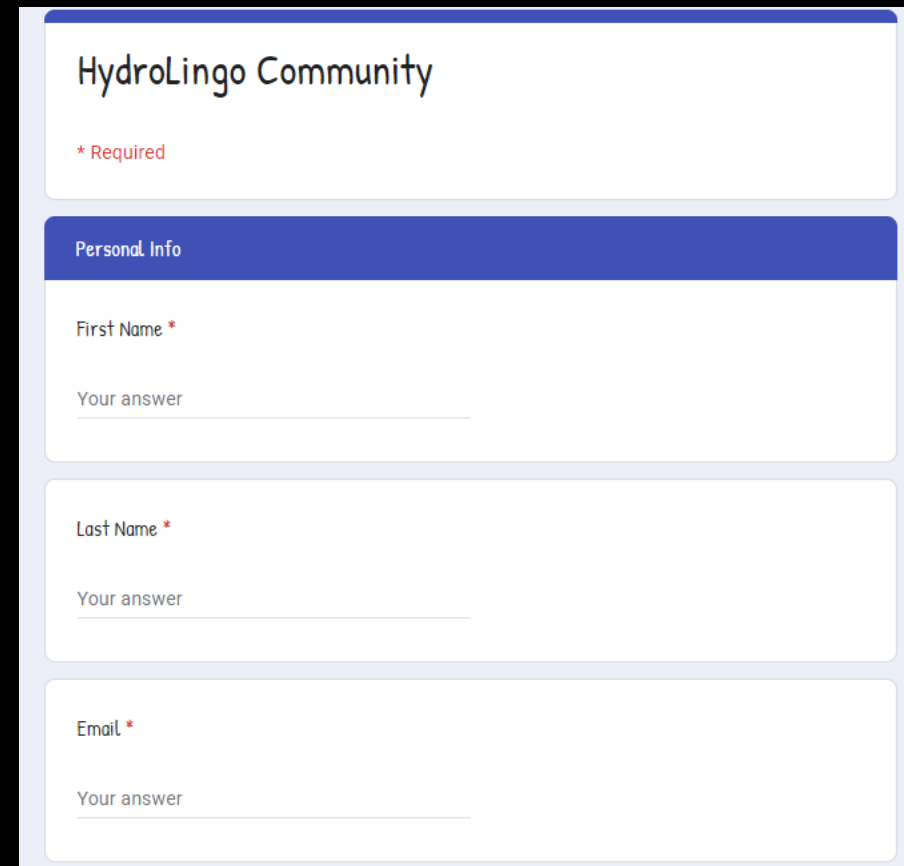


*Egyptians Farmers cultivating lettuce, while another farmer digs a small canal (marrwa) with a donkey. (Source: Hamish John, IWMI)*



# Moving Forward

- Forming a Leadership Team / HydroLingo Community / Support Team / Ambassadors
- Building a Platform
- Samples for translating research
- Podcast
- .....**Brainstorming**



The screenshot shows a Google Form titled "HydroLingo Community". Below the title is a red asterisk and the word "Required". The form is divided into sections by blue headers. The first section is "Personal Info", which contains three input fields: "First Name \*", "Last Name \*", and "Email \*". Each field has a "Your answer" label and a text input area.

Join HydroLingo Community  
(fill the [Google form](#))





If you talk to a man in a language he  
understands, that goes to his head.  
If you talk to him in his language,  
that goes to his heart.

— Nelson Mandela —

*South African anti-apartheid revolutionary  
President of South Africa from 1994 to 1999*

**Thank You!**