

# BEES, BATS, AND BUTTERFLIES: THE IMPORTANCE OF POLLINATORS FOR GLOBAL FOOD SECURITY AND NUTRITION

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## CHAT TRANSCRIPT

**DECEMBER 3, 2020**

### PRESENTERS

*Kate Gallagher, USAID Center for Environment, Energy, & Infrastructure*

*Smitha Krishnan, Alliance of Bioversity International CIAT*

*Taylor Ricketts, Gund Institute for Environment, University of Vermont*

*Claire Kremen, Department of Zoology at University of British Columbia*

*Rob Bertram, USAID Bureau for Resilience and Food Security*

### MODERATOR

*Zachary Baquet, USAID Bureau for Resilience and Food Security*

Adam Ahmed - Agrilinks: Greetings everyone, let us know where you're joining from today.

Mukundi Mukundamago: Greetings from Kenya

Adam Ahmed - Agrilinks: Welcome Makundi!

Lisa Prudnikow: Greetings from Germany ;-)

Adam Ahmed - Agrilinks: Hi Lisa, glad to have you with us all the way from Germany

Michael Butschek: Hallo, Welcome to everybody, I am joining from Mozambique, Beira

Raymond Grant: Good morning everyone

Raymond Grant: Joining from Washington, DC

Zachary Baquet (USAID): Welcome All! Zachary Baquet with USAID's Bureau for Resilience and Food Security in DC

Aunu Rauf: Greetings from Indonesia

Adam Ahmed - Agrilinks: Greetings Aunu

Brian Hirsch: Calling in from Metropolitan Washington DC.

Diana Tixi: Good morning

Adam Ahmed - Agrilinks: Hi Brian and Diana

M Marshak: hello from Eswatini

JESSICA BAROGA-BARBECHO: Good evening from the Philippines!

Taylor Ricketts: I'm joining from Vermont, USA

Enock Mutemeri: Good evening from Harare

Enock Mutemeri: Zimbabwe

Dick Tinsley: dick tinsley in Colorado

Adam Ahmed - Agrilinks: Hi Marshak, Jessica, Enock and Dick!

Renaud Colmant: Greetings from Rome

Zachary Baquet (USAID): Hello Renaud! Thank you for joining us

Indah Putri Januar Yustia: Greetings from Indonesia

Sarah Chu 2: Hello from Michigan!

Zachary Baquet (USAID): Good Evening Indah!

Anton van Engelen: Joining from Kyrgyzstan

Zachary Baquet (USAID): Welcome Sarah and Anton! Glad you could join us

Gabriela Doria 2: Good morning from Bogotá, Colombia! 🌸🐝

Felipe Librán Embid: Hello from Uruguay

Elon Gilbert: good morning from the Jocko Valley

Noubia Gribi: Good morning from Wahsington DC. Noubia Gribi at We-Empower US based NGO

Indranil Bhattacharjee : Hi, good evening from India, Indranil Bhattacharjee

Gabriela Wiederkehr Guerra: Greetings from the Dominican Republic! Looking forward for the session!

Adam Ahmed - Agrilinks: Greetings Noubia, Elon and Felipe!

Claire Kremen: hello from vancouver, british columbia

Lana Howard: Good afternoon from the UK

Smitha Krishnan: Hello from India, Bangalore!

Zachary Baquet (USAID): Hello Gabriela, Felipe, and Elon! Thank you for joining us today!

Emily Hirata: Calling in from USA

Qurrotu Ayunin : Hello from Indonesia

Pamela Thompson: Hello from Washington, D.C., USA

Tereza Giannini: hello from Brazil

Kari Flores: Hello from Northern California, USA

Zachary Baquet (USAID): Welcome Noubia, Indranil, and Claire!

Paul Mason: Good Morning from Albany New York

John Porterfield: Hello from Cuenca, Ecuador

Pranata Barua: Good morning from Ottawa, Canada

Bill Thomas 2: Greetings from the RFS BEO!

Julio Gomez 2: Hello from El Salvador

Rick Peyser 2: Rick Peyser - Underhill Ctr., Vermont

sabine weber: Hello from the Netherlands

Eva Christensen: Hello all! In Alexandria, Virginia USA

Manuel Narjes: Greetings from Stuttgart, Germany

Nic Dexter: Hello Nic Dexter from Land O'Lakes Venture37 in Chimoio, Mozambique

Mallory Orme: Hello from Arlington, VA and the AFR Bureau!

Celestina Jochua: CelestinaJochua: from IIAM, Mozambique

Darlene Gunther: Greetings from Tennessee, USA

Odiney Alvarez-Campos: Good morning from West Lafayette, Indiana

Zachary Baquet (USAID): Hello Mallory, Celestina, and Darlene! Thanks for joining

Amadou DIANE: Amadou Diane/AEG/ Mali Missiom

Daniel Abrahams: Hello all from Asheville, NC

Edo Lin: Hi; this is Edo Lin from Cambodia

Faith Bartz Tarr: Hello from USAID/RFS in VA

Zachary Baquet (USAID): Greetings Manuel, Eva, and Sabine! Glad to have you with us today

Zia Ahmed: Hi this is Zia Ahmed/Bangladesh

Zachary Baquet (USAID): Hi Faith!

Zachary Baquet (USAID): Good Evening Zia!

Sara Duran: Hello from El Salvador

Bronwyn Llewellyn: Greetings from Washington, DC! Extra special hello to Taylor Ricketts who I worked with long ago!

Zia Ahmed: @Zachary Thanks and welcome

JESSICA BAROGA-BARBECHO: Hi! I'd like to ask if my screen is not working? is there a presentation?

Noubia Gribi: can you pls add the link to the USAID publication?

Zachary Baquet (USAID): Welcome Sara, Edo, and Daniel!

Adam Ahmed - Agrilinks: <https://rmportal.net/biodiversityconservation-gateway/projects/current-global-projects/bridge/bridge-resources/the-importance-of-wild-pollinators-for-food-security-and-nutrition>

Adam Ahmed - Agrilinks: Link to Pollinators report

Zachary Baquet (USAID): Link to the Agrilinks Pollinator Month page:  
<https://www.agrilinks.org/post/importance-pollinators-food-security-and-nutrition>

Noubia Gribi: Adam, thank you so much!

Noubia Gribi: Thank you Zachary

Zachary Baquet (USAID): @Jessica we are doing introductions now. Presentation to start shortly

JESSICA BAROGA-BARBECHO: Thank you @Zachary!

Indah Putri Januar Yustia: Thank you, Zachary. Would you like to tell me why I can't see the presentation? 😞

Alioune Touré: Alioune Touré from Senegal. Hi & Thanks

Brian Hernandez: Hi Indah, are you connected on a computer/laptop or on a mobile device?

Indah Putri Januar Yustia: A mobile device, Brian.

Muhammad Tariq: Muhammad Tariq from Pakistan. Good morning to everybody

Brian Hernandez: Okay, I would recommend connecting through a computer

Zachary Baquet (USAID): Welcome Alioune and Muhammad!

Muhammad Tariq: I cannot see presentation or video

Muhammad Tariq: please tell me what can I do?

Kate Gallagher: MUhammad, are you on a computer?

Indah Putri Januar Yustia: Okay, can I rejoin after I change using my laptop?

John Porterfield: Relationship of pesticide use and pollinators: Do we know the role pollinators may play in offsetting the damages of insect pests? Also, do we know the benefit of "precision" placement of insecticides in maintaining adequate pollinator services?

Brian Hernandez: @Indah, you should be able to as long as you follow the same link that should be in the invite

Collin VanBuren 4: To those having technical difficulties, I was also having trouble and rejoined with no problems!

Indah Putri Januar Yustia: Thank you very much, Brian.

Kate Gallagher: Thanks for letting folks know @Collin!

Edo Lin: Here in SEA there is very little understanding of the role of bees. farmers actually think that bees destroy flowers.

Brian Hernandez: My pleasure, @ Indah

Collin VanBuren 4: @Edo wow! That's really surprising

Collin VanBuren 4: but good to know--thanks for sharing

Marc AMESSI: Hi, Marc from Togo

Kate Gallagher: @Edo, I had heard that can be an issue before! Highlights the need for education, I think.

Edo Lin: we are working with a pollination service provider in Cambodia and will produce a video as well to eductae.

Collin VanBuren 4: It reminds me of a study on how frogs were thought to eat cardamom seeds and were disliked by farmers before it. More education, for sure.

Brent Simpson: Maybe interesting: Crops, Weeds and Pollinators (FAO, 2015)  
<http://www.fao.org/3/a-i3821e.pdf>

Edo Lin: We have evidence that for instance in longan production and cashew bees are very beneficial.

Dr. Md. Salim Ullah Khan Eusufzai: Hi, Greeting to all .Dr. Md. Salim Ullah Khan Eusufzai from Bangladesh

Zachary Baquet (USAID): Thank you for sharing @Brent

Kate Gallagher: Thanks for sharing, @Brent. I'm going to nab these and see if we can share in our follow up email at the end.

Zachary Baquet (USAID): If you have questions, please enter them in the chatbox

Anton van Engelen: Are wild bees affected equally badly by Varroa as honey bees?

Noubia Gribi: amazing presentation,

Bill Thomas 2: Clearly pollinators are ag inputs -- just like fertilizers, high-quality seeds, and pesticides.

Dick Tinsley 2: For smallholder communities where field size is only 0.5 ac, how naturally does this level of diversification occur?

Marc AMESSI: Can there be a negative impact in expanding managed honey bees ?

Edo Lin: The advantage of the European bee (apis mellifera) is their radius for foraging. Some native bees in Cambodia have a very limited radius (500 m or less).

Emily Hirata: Have there been any studies in LMICs that show reduced malnutrition rates (so less MAM and SAM) with increased pollinator levels?

Noubia Gribi: much needed for my project in Lebanon where small holder farmers are hit hard by the pesticides prices

Noubia Gribi: how about honey production

Taylor Ricketts: wild bees aren't affected by varroa, but they do have other diseases and pathogens. And some of them can jump from honeybees to native bees.

Claire Kremen: Managed honey bees are indeed like agricultural inputs. Naturally occurring pollinators are what we would call an "ecosystem service" that we can provide in the environment through how we manage the farm and surrounding landscape.

Claire Kremen: There can be competition between honey bees and native bees which can have a negative influence on the native bees.

Bill Thomas 2: Right! Ecosystem service!

Collin VanBuren 4: The point about native pollinators doubling crop production was super great as an example of how increased (functional?) diversity increases ecosystem function. I wonder if we know how declines in pollinators in the United States or elsewhere has affected crop production. Do we have an estimate of how productive we'd be now if pollinator systems were still healthy?

Brent Simpson: Also some earlier work: Tools for Conservation and Use of Pollinator Services: Initial Survey of good practices (FAO, 2008)  
[http://www.fao.org/fileadmin/templates/agphome/documents/Biodiversity-pollination/SURVEY\\_DEC\\_08\\_Small.pdf](http://www.fao.org/fileadmin/templates/agphome/documents/Biodiversity-pollination/SURVEY_DEC_08_Small.pdf)

Claire Kremen: Yes for cashew and longan -- pollinator dependent plants

John Porterfield: Dr. William Mitsch's concept of "WetLaCulture," establishing (often re-establishing) wetland in proximity to cropland that will store and replenish nutrients for agriculture production, may also provide the hedgerow, and proximity to natural area that supports pollinators. Mitsch was featured on NOAA webinar Troubled Waters and Troubled Planet: 50 years since the first Earth Day

Edo Lin: Thanks Claire; I agree that introduction of *Apis mellifera* could affect the local ecosystem. We are studying better management of native bees as well.

Marilyn Balderas: Greetings everyone! Marilyn Balderas from the Philippines

Claire Kremen: for smallholder agriculture -- if the field is really small and they only plant one thing -- yes, its a sort of 'monoculture' but if the surrounding fields are planting other things, there can still be a lot of heterogeneity. also smaller fields naturally have more edges and edges tend to have weeds -- weeds with flowering resources are also good for pollinators, although perhaps not as good as a planted flower strip



Zachary Baquet (USAID): Welcome Marilyn! Thank you for joining

JESSICA BAROGA-BARBECHO: for Dr Krishnan, what is your hypothesis in your study?

Zachary Baquet (USAID): After Smitha we will pause for any clarifying questions for Smitha and Claire. Please indicate who your question is directed to. Thank you

Claire Kremen: Back to the question Edo about foraging range -- its good to have species with shorter foraging ranges also as they will visit the crops right next to their nest. so if you can get them to nest in the field border or adjacent forest patch, then they will visit those nearby crops. But again, I vote for diversity! having a mix of species with different foraging ranges is good to promote services in different ways -- more resilience.

Edo Lin: What is the experience of 'hiving' native bees? I believe that *Apis dorsata* can also be hived

Javier Chaparro: Will the significant use of honey bees impact negatively the population of native wild bees in the same area?

John Porterfield: We'd pay double world GDP if civilization were required to "buy" (duplicate?) ecosystem services. Needs to be accounted in the Cost of Climate Change. >  
<https://www.sciencedirect.c...>

Collin VanBuren 4: Thank you both!!

Claire Kremen: Thanks Taylor, good answer. I can add some of those studies in the chat too.

Collin VanBuren 4: I wanted to ask my question in part because I feel like the storytelling behind pollinator loss might benefit from highlighting how we have hindered our production by not protecting pollinators sooner. So I'm excited to read more about your work, thank you!

Collin VanBuren 4: @John, that study sounds great but the link got cut off for me; can you resend?

Claire Kremen: Collin, for example, Button et al. 2014 Wild bumble bees reduce pollination deficits in a crop mostly visited by managed honey bees  
<http://dx.doi.org/10.1016/j.agee.2014.08.004>

Claire Kremen: This study shows that blueberry in British Columbia Canada could be increased by 12 - 23%. Blueberry is one of the crops that provides a lot of important micronutrients too!

Collin VanBuren 4: Oh wow! That's so great--thanks for sharing!

Smitha Krishnan: @Edo Lin: Apis dorsata is an aggressive species. Hiving them isn't easy. Very few have been successful in hiving them

Zachary Baquet (USAID): Great conversation and sharing! Enter your questions into the chatbox

Brent Simpson: Zachary will the presentations be made available?

Emily Hirata: Will these slides be shared afterward?

Brent Simpson: Question (for any of the presenters): could you speak to the issue of the differences between the impacts climate change vs human-driven habitat change on pollinator populations. Specifically, how can we respond to a) the restructuring of pollinator environmental niches due to the direct impacts of temperature increase, and indirect changes to floral habitat due to thermal and precipitation change, and b) impacts on pollinator health due to decline in pollen protein content due to changes in the chemical composition of the atmosphere? These stressors are outside of those that can be addressed by restoration efforts.

Adam Ahmed - Agrilinks: These slides will be available at the end of the presentation in the file downloads pod

Adam Ahmed - Agrilinks: the slides

Zachary Baquet (USAID): @Brent and @Emily presentation and recording will be sent out to all registrants

Brent Simpson: Great, thanks!

Gudrun Stallkamp: thank you very much for the talks!

Celestina Jochua: Why the pollinators levels reduced in Mozambique? causes?

Zachary Baquet (USAID): Will also be available on Agrilinks.org

Anton van Engelen: Celestina: how many % of your forests have been ransacked by the Chinese and their allies? There lies large part of the answer

Emily Hirata: That answered my question, thank you!

Gudrun Stallkamp: What type of questions should analyses ahead of programme design be asking to understand the pollinator situation? I'm asking this quite plainly because I don't know much about it and am hoping there might already be some standard assessment questions that others could copy/paste with pride. I am asking with a strong nutrition interest angle. Thank you!

Noubia Gribi: <https://www.sciencedirect.c> is not opening, can you pls make sure the link is correct?

Emiliano Pioltelli 2: I have a question: can pollinated crop produce more micronutrients rich fruit? Which can be the underlying mechanism?

Dick Tinsley 2: How much of the poor nutrition and lack of pollinator foods if the need to concentrate on high calorie diets to meet economic opportunities based largely on manual labor requiring some 4000 kcal/day when available affordable calories is only 2500 kcal/day most going to basic metabolism?

Marc AMESSI: Can we have a study on effect of wild bees managed impact on biodiversity?

Bill Thomas 2: How can we support pollinators given the reality of agricultural pesticide use?

Anton van Engelen: The recent floods might also have reduced the quantities of wild pollinators in northern and central Mozambique.

Alejandra Arce: Thank you for your great presentations. I am an agroecologist based in Peru and I am concerned about the impact of pesticides on pollinator communities and human health. Could the speakers point a recent study or knowledge hub addressing this couple issue?

Noubia Gribi: Do you have any evidence or study that shows the harmful pesticides use on pollinators

M Marshak: I would also like to know about what is being done with pesticide research to reduce impact on pollinators to reduce and change what is being used?

Claire Kremen: yes there are studies on pesticide effects on pollinators. I can add some in the chat here.

Virginia Zaunbrecher: Is there any evidence on the impact of climate change on pollinator populations (positive or negative)?

Anton van Engelen: try [sciencedirect.com](https://www.sciencedirect.com)???

Noubia Gribi: Thanks Claire, I need to share with my participants

Noubia Gribi: Thanks Anton

Elon Gilbert: Are there studies that propose adjustments in pollinator habitat and populations that might accommodate the effects of climate change in specific locations?

John Porterfield: There is concern about zoonotic diseases jumping to humans, e.g., Covid-19. Are there risks from close contact with pollinators other than bats, e.g., bees? Is there concern about risk of human diseases jumping to our fellow creatures, including pollinators?

Claire Kremen: pesticide issue reviewed here: Ecological intensification to mitigate impacts of conventional intensive land use on pollinators and pollination Anikó Kovács-Hostyánszki Anahí Espíndola Adam J. Vanbergen Josef Settele Claire Kremen Lynn V. Dicks First published: 27 March 2017 <https://doi.org/10.1111/ele.12762>

Anton van Engelen: habitat destruction: your miombo and other forests are being ransacked and the floods might have damaged the population

Gudrun Stallkamp: thank you both so much, this is very helpful!

Taylor Ricketts: Here are the 3 papers that I referred to in my talk:

Taylor Ricketts: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0021363>

Taylor Ricketts: <https://royalsocietypublishing.org/doi/full/10.1098/rspb.2014.1799>

Taylor Ricketts: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0114805>

Claire Kremen: The IP-BES report reviews the pesticide issue thoroughly and dispassionately. <https://ipbes.net/assessment-reports/pollinators>

Robert Marzec: How might we introduce apolyculture, hedgerows, buffers, etc., in areas such as the US Midwest, where the culture is to tear down any habitat that is not considered to be the main crop--corn, soy, etc. The history continues to be farming "fencepost to fencepost". And habitat is considered a major threat to having large yields.

John Porterfield: BTW, the NOAA webinar, Leveraging AI in Environmental Science, begins an hour after this webinar

Pamela Thompson: Phenological mismatches also seem important, for wild pollinators and plants-- earlier blooming with climate change, not matching with emergence of pollinators.

Taylor Ricketts: General range shifts in bees due to climate change: <https://science.sciencemag.org/content/349/6244/177.abstract>

Noubia Gribi: Hail has damaged much of apple flowers, leading to not only bad production this year but also pushing away pollinators? any tips ?

Taylor Ricketts: Pamela: yes good point! So ensuring that there are diverse plants, flowering at diverse times through the year, can help to alleviate those phenological mismatches.

Hien Ngo: Two more papers on top of the one Taylor cited here is  
[https://science.sciencemag.org/content/367/6478/685.abstract?casa\\_token=y-chpQXb8ocAAAAA:RzGSvfdw6rGAqBKKrcblRqMMxK33Hv6LraewZIHw--t46ODzWgpvdCELkBVbCse3dfUwO\\_FaCodeUq4](https://science.sciencemag.org/content/367/6478/685.abstract?casa_token=y-chpQXb8ocAAAAA:RzGSvfdw6rGAqBKKrcblRqMMxK33Hv6LraewZIHw--t46ODzWgpvdCELkBVbCse3dfUwO_FaCodeUq4)

Emiliano Pioltelli 2: someone know study that investigate the relationship between animal-pollination and content of micronutrients in fruits?

Hien Ngo: DOI: 10.1126/science.aax8591

Claire Kremen: hi Hien!

Hien Ngo: Great talk all three

Robert Marzec: Lark et. al. 2020 showed that we've lost a million acres of habitat a year in the last 15 years in the Midwest in order to increase the area of the "main crop."

Claire Kremen: Loss of agricultural productivity on arable lands is a huge problem, Robert, I agree. This loss also argues for restorative farming methods such as I have been advocating. While sometimes such methods can be less productive in the short term -- these are the methods we need to restore from situations of loss.

Diana Tixi: How can we convince people to help us in the protection of wild bees if it is known that the 80% of global pollination is provided by only 2% of bees species?

Sara: There is a lot written about the high cost of healthy diets and how they are prohibitively expensive for poor people around the world. I'm wondering how pollinator deficits might exacerbate this trend? Has this been looked at?

Elon Gilbert: Thanks to Claire et al for good general guidelines on accommodation CC effects. I was also wondering if plans addressing CC effects in specific locations are taking pollinator impacts and mitigative measures into account. A diversified farming system is a good general approach, but the challenges associated with that can be major for example in paddy dominated areas of S/SE Asia.

Emiliano Pioltelli 2: Thank you very much for the response!!

Rangaswamy Muniappan: Recommending bio-pesticides in crop protection will have less or no adverse impact to pollinators. Conservation biological control is another activity should be considered.

Brent Simpson: In addition to the direct impacts of CC on pollinators, there are indirect effects due to changes to atmospheric chemistry, e.g.,  
<https://royalsocietypublishing.org/doi/10.1098/rspb.2016.0414>

Elon Gilbert: CC, specifically sea level rise is forcing major changes in farming systems in areas like the Mekong Delta so how to adjust pollinators to evolving farming systems - moving targets!!!

Claire Kremen: Great answer from Taylor on the need for multiple species. This general phenomenon has also been found for many other ecosystem services so it's a general principle in support of biodiversity

Brent Simpson: due to the well-mixed nature of the atmosphere the nature of the moving target is different

Diana Tixi: Thank you a lot for your answer

JESSICA BAROGA-BARBECHO: The time of pesticide/any chemical application to the crops will have an adverse effect on the pollinators. We usually advise our farmers in the Philippines that if application of pesticide in their crops is inevitable, they can do it in the late afternoon where most pollinators are less abundant (since we know most of our bee pollinators gather food in the morning). This was based on our study in mango.

Claire Kremen: Agree with Jessica on timing of pesticide application (if you have to do it). Agree with Rangaswamy -- much better to do conservation biological control (aka natural pest control) than to use pesticides!

Sara: Thanks for your answer, Taylor!

Claire Kremen: go ahead Taylor!

Eva Christensen: It's a fallacy that "biopesticides" or organic pesticides are safe for all pollinators. One article: "Common organic pesticides (biopesticides) found 'acutely toxic' to honey bees" <https://geneticliteracyproject.org/2015/10/06/common-organic-pesticides-biopesticides-found-acutely-toxic-honey-bees/>

JESSICA BAROGA-BARBECHO: I agree with Eva. May it be organic or natural pesticides, still it is not safe for our pollinators

Noubia Gribi: I can't hear anything suddenly

Noubia Gribi: bad connection?

Dick Tinsley 2: thank you for very interesting webinar

Smitha Krishnan: @Sara Carlson: the dependence of pollinator dependent crops is higher in developing countries and hence I expect the impact will be higher in developing countries

John Porterfield: This webinar was fantastic!

Claire Kremen: Diversified agroecological systems are good for pollinators, and can also provide a wider array of nutritional resources for people. So, adding to what Taylor was saying about how loss of pollinators could increase prices for micronutrient rich foods and negatively affect poor people, the converse is -- more diversified farms can help farmers themselves and local communities too with providing micronutrient dense foods.

Noubia Gribi: anything

JESSICA BAROGA-BARBECHO: Thank you to all the speakers for the very interesting topics!

Collin VanBuren 4: Thank you all so much, this has been really great!

Eva Christensen: EXCELLENT webinar!

Taylor Ricketts: Here's one of the only studies I know that directly measures nutrient content from pollination. After a quick search just now, I see few others.  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0090082>

Raymond Grant: Thank you for this useful webinar!

Adam Ahmed - Agrilinks: @Noubia, sorry about the audio issues you experienced. I'll have the recording up on the Agrilinks Event page in the next couple days.

Kate Gallagher: NOTE: We've been grabbing all of the links to papers & other resources that have been posted. We will include the list in a follow up email.

Taylor Ricketts: great point from Smitha about developing countries having higher proportion of pollinator dependent crops.

Noubia Gribi: @Adam thank you much appreciated

Claire Kremen: See papers by Remans and DeClerck (I can't find them right now) on role of diversified agriculture in nutrition

Tereza Giannini: thank you all! great webinar!

Claire Kremen: Great, challenging questions from the audience!

Zachary Baquet (USAID): We will shortly put up some polls to learn about your experience of today's webinar. Please stick around and help us to improve our future webinars

JESSICA BAROGA-BARBECHO: will you be providing certificate for this webinar?

Michael Butschek: Thank you very much for the impressiv informativ presentations! excellent webinar, very interesting Questions and answers, and thanks for the links, wish you a good evening!

Noubia Gribi: excellent webinar, useful information, thank you so much!

Manuel Narjes: Here a recent valuation of pollination services based on a hypothetical sudden loss of pollinators worlwide and for the specific case of Germany

Manuel Narjes: <https://www.sciencedirect.com/science/article/pii/S0921800920300793>

Brent Simpson: Thanks to the presenters and USAID for putting on this webinar

Claire Kremen: Thank you Rob, its great to hear about moving towards a more diversified agriculture!

Taylor Ricketts: @celestina: email me if you want the answer to yoyur question, OK?

Kate Gallagher: Thanks everyone for a truly engaging and interesting webinar!

Elon Gilbert: Good final cpmments, Rpb. Lots of career ideas for young people considering careers in ag development wherever they live

Christine Urbanowicz 5: thank you!

Celestina Jochua: Thank you

Taylor Ricketts: Thanks all!

Noubia Gribi: thank you

Svenja Bänsch: Thank you :)

Mukundi Mukundamago: thank you

Diana Tixi: thank you

Pamela Thompson: thanks! Great presentations



Alejandra Arce: Thank you, great content and resources

Manuel Narjes: very interesting webinar indeed. Excellent speakers. Thank you very much!

Celina Krings 2: Very interesting! Thank you :)

Smitha Krishnan: @Diana Tixi: Often dissemination of scientific knowledge to stake holders is often lacking. That would be one way

Julio Gomez: Great content. Thanks.

Adam Ahmed - Agrilinks: Thanks for attending everyone! We will have the post-event email with all of the resources go out early next week.

Diana Tixi: Thank you Smitha Krishnan