

## **AWP Webinar Series 2021**

### *Managing the impacts of climate change on water security*

Tuesday 23 February, 10am–12pm AEDT, Zoom

## Transcript

MICHAEL WILSON: Good morning, everyone. I'm Michael Wilson. I'm the Chief Executive of the Australian Water Partnership and thank you for joining us for our webinar this morning on the topic of impacts of climate change on water security with a focus on the Pacific. We're just waiting for participants to join and then we'll get underway.

MICHAEL WILSON: Good morning, everyone, and welcome to the Australian Water Partnership's webinar on climate change and water security with a focus on the Pacific. I'm Michael Wilson. I'm Chief Executive of the Australian Water Partnership. This is the first in a series of webinars we will be hosting in the lead up to the AWP Partners workshop on 5 to 7 August this year on the topic of water security in a changing climate.

As you may be aware, the Australian Water Partnership is supported by the Australian Development Assistance Program through the Department of Foreign Affairs and Trade but, of course, any views expressed during this webinar don't necessarily represent the views of the Australian Government.

I would like to begin by giving an Acknowledgment to Country. In the spirit of reconciliation, I would like to begin by acknowledging the traditional custodians of Country throughout Australia and their continuing connection to land, water and the community. We pay our respects to their Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Just a few notes of general housekeeping for the webinar today, which in Australian time will run until 12 noon: questions will be addressed during the panel session later in the program. Please just type your questions into the Q&A box in your Zoom control panel. If you have issues with audio, please use the chat box also for technical issues. Live captioning will be provided. Click on the link provided in the chat box. The webinar will be recorded and shared afterwards.

The objectives of the webinar today are, first of all, to learn about the Australian Water Partnership's underpinning strategic drivers for the next four years to prioritise support in the Pacific particularly and to foster a broader discussion between AWP Partners and stakeholders to identify opportunities for future work and collaboration in these focus areas.

I would like to welcome our speakers today and I will as they come up in the program introduce them individually, but just to run through who you'll be hearing from: Rory Hunter is the Program Lead here at the Australian Water Partnership; Dr Hemant Ojha is the Principal Adviser to the Institute for Study and Development Worldwide; Dr Kate Duggan is the Director of Griffin Natural Resources Management; Rhonda Robinson is Deputy Director, Disaster and Community Resilience Programme at the Pacific Community; and Dr Wade Hadwen is Research Fellow at Griffith University's Climate Change Response Program.

So, first of all, I would like to introduce Hemant Ojha, who will set the scene for us for our webinar today. Hemant is Associate Professor at the University of Canberra and Principal Adviser for the Sydney based research and development consulting firm, Institute for Study and Development Worldwide. From his early career work in the Himalayan south Asia, Hemant has worked progressively across the Asia and the Pacific, as well as parts of Africa, with a strong focus on climate change, water security and natural resources management. He has advised and consulted for programs of several international development agencies, including the Department of Foreign Affairs and Trade Australia, the Department for International Development in the UK, Canada, USA, USAID, Norwegian Norad, the Finnish Agency, and Research Agencies of Denmark, Canada and the UK. He is currently finalising a desk study report on climate change impact on water security across the Indo Pacific as a partnership activity between the Australian Water Partnership and IFSD. Hemant, can I hand to you, please.

DR HEMANT OJHA: Sorry. Thank you, Michael, and thank you, of course, to Australian Water Partnership for inviting me to be part of this very important webinar. Thank you also for your very generous introduction. Good morning, everyone, participating in this event. So I have been asked to set a little bit of scene for this webinar, so for that purpose, I would like to touch on a few elements very quickly: basically, what climate change impact is, how it is impacting the region in terms of water and security, and what sort of responses are emerging and, of course, what we can learn from the past to move to the future. So it is going to be a little generic, but I think that we will have the opportunity to go to more specific questions in the second part.

I'm just trying to yeah, OK. OK, so these are the four elements which I just mentioned I am trying to cover. So the first question is: how do we understand the impact of climate change on water security? There are, of course, different languages, different concepts, different ideas used. In my review, what I find, I think, useful is to just look at in terms of priority Goals of IPCC 2015 sorry, 2014 and then the recent work of Asian Development Bank which has assessed, in collaboration with other partners, water security in five different time zones, covering household level water security, urban water security, economic water security, including agriculture and industry, and of course environmental flow and then finally the risk side of the water, like flood and drought.

So this, I think, is one important aspect of how we frame water security and then, on the left side of the diagram, drawing on IPCC work, what is important here is to see climate impact both in terms of what comes from the sky as a hazard you know, precipitation, cyclones and all those things as well as all the social and economic drivers of vulnerability that are produced not on the sky but actually on the ground. So if we link these two concepts together, then I think we can have a really comprehensive view of climate impact on water security.

I am trying to move to the next slide. It's not working. Oh, OK, yeah. OK, so where do we stand at the moment? What is the extent of risk that is coming from climate change to water security? And many of us who are in this panel, we are experts on water, climate and all different aspects of these two problems and we all know at least many of us know that the evidence of climate impact on water security is growing in our region, in Asia, in Pacific, across Australia and, of course, across around the world. So the situation is not good. All parameters are rising, increasing, in bad ways temperature is rising, precipitation extremes is growing, more frequent cyclones, more intense cyclones, more flood, more intense flood. So we all know this, that the risk is intensifying. But the most important thing we should note here is that the risk varies across different socio ecological regions. Not every regions are affected. Sorry, this slide is not responsive. So the risk is not uniform. It varies across different socio ecological regions and the good thing is that there are new studies that are trying to downscale the impact, downscale the understanding of how climate change actually impacts water and security.

So what are the responses that we are doing, that different communities, governments and different stakeholders are doing? A lot is happening, of course, over the past three or four decades, even

without explicitly considering climate change you know, taking a more broader approach to building resilience, like integrated water management, assets based solutions, socio technical solutions. So all of these solutions involve different sort of outcomes, like restoring more water, redistributing water, diverting water, and then working through the entire water cycle, controlling pollution, enhancing the quality of environmental flow, quantity of environmental flow. All those kinds of biophysical solutions are supported by a range of institutional and policy solutions. But then, as I have highlighted I don't have time to go through all of these there are several problems. It's still technically focused, good policies but not quite implemented, and sometimes this integration narrative is not really translated into practice, so we have a lot of problems that we need to look into, dig out, as we look to greater and more intense risk of climate change on water security.

Now, my final slide it's not moving; yeah, OK, sorry. OK, this is my final slide where I just wanted to highlight a few things about moving forward. So my point here is that, given the climate risk is intensifying, sometimes going out of proportion, going out of the tipping points, it is really important to learn from the past, and doing more of the same is not going to help. So we need to shift our thinking, for example, from just focussing on risk assessment and prediction and modelling to creating more policy relevant and actionable knowledge, and, likewise, treating water not just as a specific sector of government or development but as a cross quarter sectoral system, cross quarter system. It traverses everywhere, all different sectors. It is really important to see water as a system and manage it to minimise the impact of climate change.

So we all know we need to work on a transboundary basis, across all the political boundaries. And transferring this scientific knowledge is not enough. We need to engage in co production of the knowledge and then we also need to move from resource management to water cycle management. That can take us to all the territories through which water traverses and then even to lead to the environmental system where we want to throw the water. And we also need to think as much of recycling the water, rather than using and throwing it into the environment.

So all these kinds of steps, including the final point I wanted to say, which is because managing climate risk requires systems level changes, we also need to think beyond project build focus. Of course, we cannot act all the time. We cannot have manage investment needed for that. Even if we do small things, we need to think of this longer term system wide resilience building and transition. So these are some of the shifts that I think are important. I think with this, I would just like to conclude because I already ran out of time and I hope we will have opportunity to have more discussions in the later part. Thank you very much. Thank you, Michael. Over to you.

MICHAEL WILSON: Thanks very much, Hemant, for that excellent and quick introduction. Plenty of food for thought. I've asked Rory Hunter, who's our Programs Lead here at the Australian Water Partnership, to give a brief overview of activities that we're currently running or are in our pipeline which contribute to reducing climate change impacts for improved water resource management. Over to you, Rory.

RORY HUNTER: Thank you, Michael. I'm just driving the slide there. Ah, yes, I've got control now. Thank you. Good morning to everyone. As Michael said, I'll give a quick overview of where we're focussing on climate change and water security. So we currently work most of our work is focused on South East Asia, Mekong and Indonesia, south Asia, in India, Pakistan, Nepal and Sri Lanka, and we have also investments in the Pacific, mainly our support to the Pacific Water and Wastewater Association, and we're currently in the process of developing new activities in the Pacific focussing on climate and water security.

It's estimated that I'll back up, sorry. It's estimated that ... It's very sensitive. Sorry about that. It's estimated that around 2 billion people live in areas that have extremely high water stress, and that situation is expected to get worse as populations and demand for water grows and the impacts of climate change intensify. Obviously, areas like Australia, Africa, the Middle East and central Asia are

areas with high water stress but we're getting more and more requests from countries in Asia and Pacific to assist them in managing drought and the impacts of water stress.

We currently implement most of our work through four domains, so that's catchments and river basins, integrated urban water management, irrigation modernisation and environmental water quantity and quality. And with all of those domains, climate change and water security is integrated throughout our activity portfolio, and I'll just take you through some of these examples now.

Obviously, managing agricultural waters is very important in Asia and the Pacific. It's estimated that in some countries in Asia, up to 90% of diverted water resources is used in irrigation. So we've been working with FAO under our Next Gen program to promote a more modern approach to irrigation water management. One of those focuses is on gender, water and food synergies in support of the SDGs, looking at managing gender equality and social exclusion and irrigation decision making, and also trying to restore some of the natural resources related to irrigation schemes and dams, so we're working with CSU, building on their previous work in Laos around fish friendly irrigation, trying to restore aquatic biodiversity and ecosystem services and taking a more catchment, a more landscape approach, to water resources management.

We also did quite an innovative irrigation performance assessment with Blackwatch Consulting that combined household surveys and innovative remote sensing work to try and estimate the efficiency of some of the irrigation schemes in Cambodia, and that will hopefully then be outscaled to influence the design of new irrigation schemes and rehabilitation of existing irrigation schemes throughout Asia and the Pacific. And we're just currently launching a new activity with University of Technology Sydney on an assessment of water and food security in the Pacific which builds on the great work that ACO did in response to COVID 19 looking more at food security.

We've obviously promoted a lot of our water efficiency and irrigation projects in Thailand and Vietnam and we've recently also started one of these drought mitigation projects in India. That's working. And thanks to the work of CSIRO and University of Western Sydney, we have been able to also expand that out to include three states Andhra Pradesh, Karnataka and Odisha states. It focuses on key three elements of water resources management that's climate, groundwater, irrigation and soil health and also helps to outscale our MARVI project in India. We see Managing Aquifer Recharge as an important climate adaptation measure, and through some modern technology, we trialled MAR technology in three locations in Sri Lanka. This process helped to improve water security through MAR. It involved screening regions to identify the source water and storage locations and working with stakeholders to find and meet water needs. And now the Sri Lanka Water Resources Board has been able to apply for funding to start trialling some of the Managed Aquifer Recharge.

We also emerging from the Millennium drought was the Alliance with Water Stewardship certification and standards, so we see this as really important, working with industry to manage their water risks at a sort of site level but also at a catchment level. We feel that's a really important approach, looking at alternative water sources, water conservation, looking at more nature based and energy efficient solutions, and incorporating some of the Indigenous and biodiversity values. So our work with the Alliance for Water Stewardship in Asia and Pacific focuses on industries and catchments in Indonesia and China to improve water security.

We have also been implementing a number of water utility twinning programs in Asia and Pacific, in Vietnam, Indonesia, Nepal and the Pacific Water and Wastewater Association to manage the impacts of climate change. During COVID 19 there was a really strong focus in water management on building resilience, particularly the importance of having access to water and sanitation for mitigating some of the impacts of COVID 19, but that business continuity planning has really been expanded to ensure cities and towns can maintain water security, maintain core business services during extreme weather events, such as flooding and drought, and then help them to develop some risk reduction strategies, so that could be improving treatment processes to manage some of the variable inflow that

can be the result of flooding. So that has been a key focus of our work in the urban and rural water supply sectors.

Often when we're talking about water security or water scarcity, there's a big focus on drought but we also have been focussing a lot on managing some of the flood impacts that can have an impact obviously on water supply and assets, on some of the urban populations, particularly those who live in urban slums. So we've been working with the CRC for Water Sensitive Cities, the World Bank and ICEM to trial the application of nature based solutions in urban flooding in Thailand and Vietnam. There are some really interesting case studies in Ho Chi Minh City, in Phu Quoc in Vietnam and in Sukhumvit district in Bangkok, and in Sukhumvit Road in Rayong. It's been quite innovative work to not only choose and look at the different options for nature based solutions but then value those nature based solutions against some of the more standard infrastructure that's been acquired for flood management. So hopefully that project can be expanded to other countries in the Mekong region and the Pacific and we look forward to sharing some of the project results with you from that project.

We also make sure that climate change and water security is integrated into our knowledge products. We don't see our knowledge projects as a blueprint of how countries should do water management but we think they can be used elements of them can be used if they're context specific. So WaterGuide was developed to manage water under scarcity, and that has been trialled in Uzbekistan, Jordan and other countries, and elements are currently being used in Pakistan. The WaterTools approach, which included an eWater source, the National Hydrological Modelling Platform, the Geoscience Data Cube and BOM's water forecasting tools, shared the Australian experience but then was trialled in Cambodia. And the BasinGuide, which is one of our newest publications, actually emerged out of a product that was developed on the India River Basin Planning Guide. We thought it was also important to share the Australian experience.

So that's it in terms of a quick overview and we look forward to sharing more about how our activities are contributing to managing climate change and water security in Asia and the Pacific. We look forward to sharing with you some of our new initiatives in the Pacific as they start to be developed. So I'll hand back to you. Thank you, Michael.

MICHAEL WILSON: Thanks very much, Rory. Excellent summary of our activities. You can get in touch with Rory if you have other questions about our programming.

I would like to move now to introduce each of our other panelists. So we'll have a panel of four later on in the program, but I want each panelist or I'll ask each panelist to briefly introduce themselves and their view of the most pressing water security and climate change issues on the horizon. We are continuing to collect your questions that you've been entering in the Q&A box. We'll address them when we get to the panel discussion session.

So, first, I would like to introduce Kate Duggan. Kate is Director of Griffin Natural Resources Management. She has 25 years experience in environment and natural resource management, working in community based regional and national programs to improve the management of land, water, vegetation and biodiversity at local and landscape scales.

Currently, Kate is Team Leader for the Australia Pacific Climate Partnership, which works across 14 Pacific countries to deliver climate and disaster resilient development, building skills and capacity for local solutions through the AustralianAid program. Over the past decade, Kate has worked extensively with public sector agencies and industry groups in the analysis and development of policy and programs in natural resource management, water resources and rural livelihoods within Australia and internationally. She combines a strong research background with extensive practical experience in Australia and in the Asia Pacific region. Can I hand to you?

DR KATE DUGGAN: Thank you, Michael. Good morning, everyone, and thanks for that introduction. Can I also thank Michael and the team at the Australian Water Partnership for the opportunity to be

part of this discussion that will hopefully lead to a stronger footprint of the Water Partnership, both in the Pacific and also in climate change.

I'm just going to OK, I'm not able to share my screen, so I'll just continue on. I'm just going to speak very briefly today about a little bit about some of the latest climate trends that we're seeing emerging in the Pacific, what this means for water security, and then just a little bit about the political and institutional settings that are around for the environment where we need to work.

So the latest climate science since 2014 is showing some interesting trends, and just a few little comments on that. It's likely that historical heat records will be broken in the Pacific almost every year from now on. The hottest year before 1970 is now a very cool year. There are already major disruptions to rainfall. Sea levels are rising fast. Sea level to 2 metres by 2100 can't be ruled out. And there's a whole new ENSO El Niño story emerging. The result of all of this is that security and, indeed, habitability of low lying atolls and coastal communities in the Pacific is likely to be compromised by around 2050.

So what does all of this mean for water security in the Pacific? There's a huge diversity in the Pacific, and climate change is hugely contextual. So we tend to talk about geographies that allow us to contextualise what the impacts actually mean on the ground. So we talk about low islands, so they're the atolls, the small islands Kiribati, Tuvalu, and also small islands off Fiji and PNG, and so on where groundwater systems and shallow coastal and alluvial aquifers are the main sources of supply. Many of these are already stressed in urban settings and they're compromised now by streamflow, less infiltration, as well as sea flooding salt. Think of the Bonriki lens on South Tarawa in the Kiribati.

Then we talk about high islands, so the volcanic and the raised coral islands that you find in PNG, in Vanuatu, Solomon Islands and Fiji. These have catchments and rivers and aquifers, and many of these are also stressed in urban settings and experiencing more intense flooding, erosion and damage from cyclones and storms. Think of the Tagabe River near Port Vila in Efate, Vanuatu.

Just a few comments on the political setting: the Pacific Island Leaders Forum in 2019 unanimously declared that climate change is the most important issue affecting Pacific Island countries. Naturally, a lot of the work that's been done there, including in the water sector, is funded through international partnerships. At the moment, there's roughly \$2.5 billion invested by international donors in current and recent climate change projects in the Pacific region. I'm just going to see if I can share my screen now. No. It's not letting me. So I'll just keep on going. So of that 2.5 billion US in international climate finance in the Pacific region, around

MICHAEL WILSON: Kate, you should have control now. Just try again.

DR KATE DUGGAN: OK, I'll just try. No. It's just sorry but it's just not doing it. Of the 2.5 billion, around 0.4, or 16%, is invested in WASH, so water supply and sanitation hygiene, and some small water related adaptation projects in the region. And there's around 67 million invested in large scale flood management in the Samoa Apia flood plain, for instance with plans for work on the (inaudible timecode 32 minutes) River flood plain in the not too distant future.

So there's quite a strong focus on utilities and water supply and WASH in the Pacific, and getting potable water and sanitation facilities to remote, isolated and urban island Pacific communities is one of the major priorities of every single Pacific government. But there's generally not a strong, overarching institutional setting nationally, provincially, at catchment level for water resources management, as we know it here or as we know it in Australia. So the water resource management agencies, policy, integrated catchment plans, streamflow and groundwater monitoring, they're there but they're isolated, they're sporadic and they tend to be project based. We did, though, notice that the Government of Tonga recently engaged consultants to scope out water resources in Tonga to inform the development of a new water resources policy, but that level of governance is certainly not

what you would find in lots of other places around the world. However, there are really strong traditions of community governments of water resources, particularly rivers, but also community wells, and there is some hydro development, for instance in PNG, Solomon Islands, Samoa, and storages in urban settings. And small-scale diversions in irrigation, but generally, in community settings, water resources are managed locally.

This, of course, has important implications for how we work and who we work with. So working with traditional government structures, community engagement and consultation, working with local partners and providing opportunities for professional development are all extremely important. And civil societies is also key. International and local NGOs are the de facto delivery agents for an awful lot of the WASH work that happens in the Pacific; for example, through programs like the Water For Women initiative and many others that are funded by Australia and New Zealand and everyone else in the Pacific region.

Finally, I just wanted to talk a little bit about some of the work that we are doing with CSIRO and the Bureau of Meteorology and others, looking at what is coming out of the next generation of modelling for climate, the CMIP6 modelling, the new IPCC new reporting, to develop low case and high case scenarios, looking at what futures will look like under high emissions and low emissions cases. So where's the fork in the road? What are the crisis points? And opportunities for interventions in food and water security. So watch that space for this one. Thank you.

MICHAEL WILSON: Thanks very much, Kate. We managed to get your slides up on the presentation. There's just some delay in the controls but we will press on.

The next panelist I would like to introduce is Rhonda Robinson. From 2011 to 2017, Rhonda was the Deputy Director for the Water and Sanitation Programme at the Pacific Community and was responsible for the coordination and management of the Pacific Regional Water and Sanitation portfolio in the 22 member countries in the region. She was appointed to the role of Deputy Director, Disaster and Community Resilience Programme in March 2018 at the SPC and is now leading a new program established to achieve the Sustainable Development Goals through evidence based action partnerships for resilience through integrated action on disaster risk management, climate change adaptation, natural resource management and increased access to water and sanitation.

Rhonda is a graduate from the University of the South Pacific and the Australian National University and she's worked in various capacities for the SOPAC Commission and the SPC over 18 years and has Pacific regional knowledge and demonstrated experience supporting resilience building efforts through high impact water sanitation and hygiene programs, disaster risk reduction and risk management in the public sector and broader Pacific resilience development. Rhonda, can I hand to you, please?

RHONDA ROBINSON: Vinaka, Michael, and bula, everybody. All protocol observed from my end as well, including an acknowledgment of the people of our land past, present and emerging. It's great to be here this morning and to talk about something that's very dear to our hearts here in the region, which is the impacts of climate change on water security, and it's something that we as a team here in the SPC have been working on for many years now.

I get the great opportunity now and again to tell our story, but it is not mine alone and I do want to acknowledge all the work that goes on with the teams here in the office and our country counterparts as well in government and in civil society and other groups.

Before I lead into some of the reflections I have around this topic, I think it's also useful to provide a little bit more context. I acknowledge Kate's comments previously and Dr Ojha's as well about some of the work in the Pacific, and particularly the risk vulnerability and exposure lenses we need to be applying, and I am hoping I can add some more value to that conversation. I'm wondering if I have access? If not, could I please go to the next slide.

MICHAEL WILSON: You have access, Rhonda. You do have access.

RHONDA ROBINSON: Sorry, Michael. Doesn't seem to be happening. If you could push on for me.

OK. It looks like I might have access now. Again, apologies. I don't have access from this side but I'll continue on in any case.

The first thing I really wanted to speak to in terms of contextual setting is sort of how the Pacific is positioned in so far as risk is concerned and the understanding of risk. Thank you for that.

Dr Ojha spoke to this idea of risk in his talk and I just wanted to raise to the attention of our attendees today and panelists that in the Pacific, when the World Risk Index is put together for about 180 countries in the region, the Pacific features in the top 20 insofar as risk is concerned. So what they do is they take some areas of exposure that we have to natural – primarily natural hazards and then they combine that with what they determine to be vulnerabilities in the Pacific region and it comes out with a risk ranking. And the Pacific sits in the top 20 of the risk ranking in the world. Vanuatu, as you might expect, is the number one, followed by some of the other countries you see up on the screen: Tonga at number 3, excuse me, Solomon Islands at number 4, Fiji at number 12, Kiribati at number 19 and Papua New Guinea at number 6. And for further context, Australia is placed 124 out of 180 countries.

So what does that mean for us? It means we are really, really vulnerable to water related impacts of climate change and natural hazards such as floods and droughts and our ability to cope with these impacts in the sectors that we work in, and primarily in the water and sanitation sector in the context of this discussion.

What we've come to understand in 2020, however, is that this doesn't account for infectious diseases. So pandemics like COVID 19 is not accounted for in the World Risk Index. And it's turned out to be the biggest disaster of our century and we're overlaying that together with all the other established risks we're also facing in the region and hazards we are facing in the region. So I just wanted to contextualise the risk dimension for us all.

Could we move to the next slide, please? This slide is really to show how we're placed insofar as the Sustainable Development Goal for water is concerned and sanitation. This shows that the Pacific region, represented by the Oceania bar, is lagging behind the rest of the world insofar as the percentage of our population using at least basic water services. We also are lagging behind sub Sahara and Africa as well, and despite some gains made at the country level in improving access, overall as a region we're not doing too well in terms of access to basic water services. Can I also get the next slide, please?

In terms of sanitation, the story doesn't look too good either in terms of the Oceania statistics. In terms of sanitation, we as a percentage of population, using at least basic sanitation services, are sitting at around 30% and again lagging behind the rest of the world. So the main message from the access statistics I am sharing is really to make the point that again, while we're making progress at the country level in increasing access perhaps to water and sanitation services, as a region we're not keeping up with the pace with population growth and climate change impacts as well. And, by the way, these statistics also include Papua New Guinea, that take us in a direction that accounts for the large numbers – the large population numbers that Papua New Guinea has, so that's why the statistics also show you those numbers.

Those are the only slides I have and I'll maybe just continue with some of the reflections I have on the topic as well, if I can. With that contextual setting in our minds in terms of access and the risk profiles for our countries, we in the Pacific Community, or SPC, that work directly with our member countries in the region, primarily the national government entities for sanitation at the national level and the other sectors, we continue to ask ourselves: how do we make a difference, particularly a real difference for our communities through strength and water security and the work that we do? So we



gathered around the room about 15 months ago across a cross section of Pacific Island countries, sectors and partners and put our minds to this question and we came up with a call to action that covers a few priority areas and also some opportunities for action as well.

Firstly, we found that leadership on water and sanitation needs support and strengthening, and that's at all levels. This we felt was a key barrier and applied equally not only to our member countries but also our civil society actors and our development partners. There is a need for better awareness but also there's a need for a more meaningful way to communicate issues in a language and currency set up that our leaders can relate to, to allow them to be able to put investment in the right places and support communities in the right ways.

An example here was spoken to by Kate a little earlier about climate change being recognised by our Pacific leaders as the biggest security threat in the Pacific region at the moment. We've positioned the WASH agenda in the Pacific as a key resilience effort in addressing the impacts of climate change and disasters and, in fact, our program is sort of set up to acknowledge that same effort as well. But we know we're only on the side of that conversation a lot of the time and not central to it, so we continue to find ways and we continue to work with partners to try to bring that more to the centre of the conversation in terms of regional security efforts, integrated agendas on climate and disasters, as opposed to the side and accompanying piece that it often is put on, and we do that with partners as well, and I'm happy to note that we're progressing some opportunities here with the Australian Water Partnership, for example, and other partners to try and elevate, advocate and engage around this issue.

On the issue of local communities, we also recognise we're the least urbanised region in the world, and so for water and sanitation, it's primarily managed at the household level outside of the urban reach of the water utilities. And at the rural level, where most of the community sits, these communities really face some challenges – access to supply chains, building and maintaining technical capacity, et cetera. What COVID 19 has really shone a light on is the need to strengthen local efforts and localisation, and again we do that in different ways.

We fully encourage the utilisation of capacity that exists in the region, and oftentimes the availability of that capacity can be challenging, but we recognise that there is an importance to utilise the regional capacity where it exists, regionally and nationally. Well intentioned technical assistance that comes in and out every so often is welcome and there's a place for that, but really building long term commitment, trust and relationships with local actors that allow us to build that capacity over the long term is really important, and that takes time and that takes commitment. We have examples of that work in some of the work we're doing within the region and we would be happy to share that, but clearly more needs to be done in this space.

I know time is going and I might just end with one final area, which is on coordination, and I speak to this in particular because it is such a big issue for us in the region: the need to better coordinate our efforts within the sector but across the sector as well, and the previous speaker spoke to this a little bit.

We look to examples in the region that are doing some really good work, for example, in Samoa, where there has been a lot of bilateral support to sectoral coordination within the water and sanitation sector. There's also work that's going on that does cross over between the water and sanitation sector – climate and disasters, for example, in some of our atoll based initiatives – and that's really seen some gains.

What we're not doing particularly well, though – and there's an opportunity here for all of us – is the need to be able to work more closely with central line agencies in government, like finance and planning; bringing the sector closer to the development agenda and the resilient development agenda. And these are sort of things that we continue to try to work through here in the region and at the country level as well. Central line agencies manage the budgets, they manage the planning

activities across government, they hold the power and the influence, and sometimes that makes all the difference. So how do we do that? How do we bring this sector closer to the development planning agenda?

I might leave it at that, Michael. There's a lot more here but I'm mindful of time and I'm happy to take questions after. Vinaka.

MICHAEL WILSON: Thank you so much, Rhonda. Very powerful messages there about what the landscape looks like from a Pacific perspective, sitting in Noumea, handling all of these problems and demands and opportunities which arrive on your desk. So I know people will have plenty of questions of you in the Q&A session and thanks once again for joining us at that distance.

Next I'll introduce Dr Wade Hadwen. Wade is an aquatic ecologist with over 23 years experience exploring in an interdisciplinary way how human and ecological systems interact. Wade has experience and skills in projects exploring climate change impacts and adaptation opportunities and has led numerous large collaborative research teams both in Australia and in the Pacific.

Specifically, Wade has explored the biophysical and social aspects of climate change with respect to water sanitation and hygiene services in Fiji, Vanuatu, the Solomon Islands and the Marshall Islands. The common thread in all Wade's research is water, especially how it is used, valued, impacted and managed. He adopts a holistic transdisciplinary approach to tackling complex water challenges and enjoys working with colleagues from a wide range of disciplines to better understand complex problems like climate change and to identify sustainable management solutions. Over to you, Wade.

DR WADE HADWEN: Many thanks, Michael. And hello, everyone. And, again, thank you to AWP for organising this event. I think it's a really critical discussion, so it's great to see so many people here interested in this topic. I would also like to tip my hat to the speakers we've already heard from. Some of the things that I've got to say will echo very loudly the things that they've mentioned.

Particularly I would like to start by noting that climate change is certainly a very real problem in the Pacific and it's an acknowledged one, so although sometimes our discussion in Australia is a little immature around climate change, when we're thinking about Pacific island countries and as Rhonda showed with her slides there's a high level of understanding in terms of the risk many countries face.

What's a problem I think for the Pacific is that it's a very large area with very small countries, so when we see maps of water stress like what Rory showed us earlier, we don't see the Pacific at all. It doesn't appear, and that's a problem because it means it drops off people's awareness and people's concern. People focus where all the red is on those global maps and forget about some of these Pacific island neighbours of ours that are doing it tough and certainly face a bleak future in some regards as well.

In addition to that, Rhonda shared that slide about the climate risk for Pacific countries and there were six countries that weren't represented at all because there wasn't enough data, I suspect, to generate those indices. That certainly doesn't mean they're not climate vulnerable countries. In fact, they are very vulnerable the ones like Palau and Tuvalu and so on.

So I want to talk to you about a little bit today is just how threatening climate change is to some of our Pacific neighbours and I guess some stories that we have heard in terms of the work I have done on a range of DFAT and donor funded projects in the Pacific over the last nine years or so. Why I'm going to talk about stories is because data is a problem in the Pacific. So often we feel like we don't have enough information to make good decisions or strong decisions but what is abundant in the Pacific and Rhonda mentioned this as well is stories. So I think we need to learn a lot by chatting and listening to people in the Pacific so that we can then build a better understanding of people's situations, what they think the risks might be, how they value water, how they use water. So some of the projects I've been involved in have been, I guess, coupling our scientific knowledge with our understanding, through conversations, of the stories that people can share with us.

So I just want to share a couple of quick stories. One is a project that was funded by DFAT that I led a couple of years ago now. We worked in the Solomon Islands, which is a very water abundant country a lot of the time. In fact, water security is a problem mostly due to the abundance of dirty water during those large flooding and cyclone events. So even though people are surrounded by water, they have very poor access to quality water that is safe to drink. We were really interested in understanding people's experience with floods and how they managed their water resources and their use of different sources of water across those wet season times in those disaster times.

What we learnt is that there isn't a strong custom of collecting rainwater, even though it is abundant certainly very abundant at certain times of year. And this is very important for us to recognise, that different parts of the Pacific have different customs and cultures that can, I guess, enable or disable some of the solutions that we might try and come up with in terms of adapting to climate change. So even just developing some capacity to store water or capture water during the really wet times in places like the Solomons may help provide a clean water source to people during those times of need.

In contrast to that, the work we've done in the Marshall Islands, an atoll nation with only two metres of elevation to play with, so very much risk of sea level rise, the major problem there, aside from sea level rise, has been the fact that there's no surface water, so unless it's raining, there is no easily accessible source of fresh water. There are, of course, wells tapping down into the lenses that sit underneath those atoll islands but they're easily contaminated by a range of contaminants but including salt water. So as sea level rise becomes a growing problem, saline intrusion into those groundwater lenses are going to represent a great challenge for people in terms of access to clean, reliable, safe drinking water.

Stories that we have heard from in the Marshall Islands have told us that people used to cope with drought in a variety of different ways, and drought is indeed a major threat to communities in remote, rural atolls throughout large parts of the Pacific. The Marshallese people we have spoken with have told us stories of how they used to get in their boats and travel around the island chain, using freshwater resources as they went, and so they didn't completely exhaust any one source because they kept on the move. Interestingly and I think Rhonda spoke to this a little bit there have been some technological solutions that have helped communities in more recent times, either delivering bottled water when it's needed or delivering desalination units, so small, briefcase sized, portable, solar powered desalination units to provide a source of clean, safe drinking water during those drought times.

Some of our research has revealed that there's growing dependency on that technology but there's some concerns around the reliability of that technology. If it breaks, who's going to fix it when the nearest part is in the US or Australia? So there's some concerns around, I guess, changing behaviour, so if people are no longer travelling across the chain of islands and they're staying in a single place and relying on technology, we need to think our way through what that might mean in terms of their risk if things go wrong.

So part of what I'm talking about, I guess, is the really diverse geophysical environments, and Kate mentioned this as well in her presentation, but we also need to recognise that there's really different social and cultural environments through the Pacific. So some of the communities we've worked in have been very strongly matrilineal and others have been very strongly patriarchal, and that really changes the way that the community behaves and changes the way that adaptation options that we may think about putting in place in the community, how they will play out. So understanding that local context is critical, both in terms of the climate, the geography and the humans, the society, that we're working with. Some of our work in Vanuatu has revealed that nakamals, so those local decision making areas in small communities, still drive a lot of the decision making, so there's a very strong bottom up government structure in certain parts of the Pacific and so we don't want to lose sight of that when we're thinking about interventions that might help.

So I think these stories really help us understand that although we might develop an overall approach that we can apply throughout the Pacific region, we can't apply the same technology or the same solution just as a one size fits all solution. That's not going to work in the Pacific. So I think it's really important, as Rhonda said, for us to listen to stories from the Pacific, learn what we can and work collaboratively with SPC and other communities to deliver things that people in the Pacific want to see in their communities and work with them so that they know how those systems work and what they can do if things go wrong.

Part of our thinking around that is that we need to adopt a systems approach and I think it's been interesting looking at the presentations so far today that, although often we're talking about water security, we keep bumping into the other sectors, and that's because water sits at the very heart of everything that we do. You and I are 60% water. We can't do anything without water. So water should very much be at the heart of all of the things that we do, and planning around water availability, water quality, really helps us ensure that the impacts of climate change can be mitigated.

So we've been adopting very much a systems approach using Bayesian network models and system dynamics models as tools to help us understand the connections between all of the elements in a single location. So how does a community use its water resources and where does it get its food from? What sort of energy sources are required as well? Plugging all of those things together enable us to take a systems thinking approach to think our way through what climate change impacts might look like but also think our way through what adaptation options might have the best chance of sticking and helping those communities as well.

So I think really I'm echoing some of the things that other panelists have already spoken of but I just wanted to finish by talking a little bit about the connections because, although we model our systems using a connections kind of model, it's important for us to also recognise the deep personal and spiritual connections that people in the Pacific have with their place, so with the land and ocean environments that they live in and around. It's difficult, I think, for us sometimes to understand the depths of those connections and the meaning of those connections, but the more we do sit down with people and listen to their stories, the better off we'll be in terms of helping those people understand what the risks are and also what some of the solutions might look like going forward. So I'll leave it at that and I look forward to some Q&A in the next session.

MICHAEL WILSON: Thank you very much, Wade. Again, a very powerful and concentrated presentation. A lot there. I'm having a look at some of the questions coming through on the Q&A are specifically directed at panelists, wanting access to some further background and research information. We will endeavour after the seminar to get some of that together from the panelists and push it out to those who have asked for it, but if I can encourage you to continue to use the Q&A platform to register your questions. But first I'm going to encourage a bit of a conversation within the panel arising from some of the highlights and pieces of advice that panel members have given us in their very brief presentations.

I'd like perhaps to start with Kate Duggan. Maybe panel members could all turn their cameras on now. Kate, you talked quite a bit about the diversity across the Pacific region, the impact that's come through very powerfully, and, of course, it's reasonably obvious from all of the presentations, but how do we come up with a development policy approach across such a diverse region as the Pacific, even in something as important as water security and the impacts of climate change? How should development agencies, for instance, prioritise this information and get it into a shape that's chewable, if you like?

DR KATE DUGGAN: Thank you for that question, Michael. I think that a lot of people have done a lot of thinking about water resources and the impacts of climate change in the Pacific and there have been a lot of studies done, I guess particularly in atoll and coastal situations, to try to understand what those impacts are likely to bring and then what the potential interventions might be. But I think it comes down to the fact that because the region is so diverse and because there is a very strong

tradition of local governance, it comes down to, I guess, understanding where the big gaps are. As you know, there are lots and lots of data gaps, which is a real problem, but when you go to particular places, people know what they've experienced and what they're experiencing and people have a lot of their own knowledge about how to actually manage that. I think someone sorry, I can't remember exactly who it was, but somebody mentioned that people are kind of used to dealing with floods and drought and so they do have knowledge within their lived experience.

We know that climate change is bringing a set of scenarios that will take us outside that lived experience, and that's a huge challenge, but across the region, I guess, understanding at least at national level what the priorities of governments are, what the gaps are within those sets of priorities and then drawing on that technical and traditional knowledge to start to frame what the first priorities in terms of planning and policy would be.

That said, I'm struggling a little because I think Wade and Rhonda also kind of touched on the fact that governments in the Pacific don't have the same purchase or mandate, if you like national governments that they do in many other settings, so even at national level, in many countries there'll be traditional governance structures that you need to also work with. Making high level political and policy statements and priorities and plans actually work in practice is a whole different ball game in the Pacific to many other areas, so it's a really good first start to get that national framing and regional framing, and I am sure SPC has been doing lots of work over years on this, but then drilling it down. And people talked about downscaling and getting local input into it is the key and also the biggest problem. Did that answer your question?

MICHAEL WILSON: Yes, thank you very much, Kate. And I'm going to throw to Rhonda for a related question, but on the other side on the other side of the discussion, we know that Pacific leaders and public servants and utilities managers and civil society leaders are extremely busy people in the Pacific, probably more than anywhere else, and expected to be across huge spans of issues. So, Rhonda, you talked about this call to action exercise that you did with your counterparts, facilitated by the SPC, but thinking of the partners who may be keen to assist, keen to talk to you and understand the challenges that you face and why you have listed the priorities you have decided to list in a call to action, how do you discriminate against those that you spend time on and time with? How do you prioritise amongst the partners and the offers for help and what gives you encouragement that a potential partner is worth investing your time and effort in?

RHONDA ROBINSON: Thanks, Michael, and that's an interesting question. The crux of it is we are guided by national priority areas, and so this is how we develop the regional parts of the work we do. It's all driven from where the countries themselves see some of those priority areas. You're absolutely right, national governments are absolutely busy. I mean, you try and get face time with your national counterparts, particularly before a disaster event is about to occur, like a tropical cyclone or after, which for us is becoming more often than not, if you look at the last year just in the Pacific alone, their attention and their priorities shift. It's about getting communities better prepared for the incoming event and how we respond after, and then the recovery rehabilitation work that happens after that. And so we've had to pivot quite a bit and position the water and sanitation agenda in that space, that constantly changing space. And so for one, our cue is also from the national level priority areas and the second point to raise is just the ability to pivot and change the approaches that we take regionally and nationally to accommodate the needs that the countries have. And in determining the partnerships that we have and the partners that we work with to address those priority areas, it really comes down to whether the country's priorities are lining up with what our partners are wanting to support and progress nationally and regionally as well. I make it sound really simple but there's obviously nuances in all of that. There's partnership management. There's politics. There's capacity. There's trust building and there's commitment. And so we're navigating through that sort of landscape all the time. I don't know if that makes sense but that's a quick snapshot of a response I might like to give.

MICHAEL WILSON: It makes it makes enormous sense, Rhonda. I have just got a question come in on the chat again for Rhonda. I don't want to make you too busy in this, but from Tony Slatyer from the Water Policy Group, who is also the Australian Government Special Adviser on water and involved in quite a few of the international discussions around water and water security and taking SDG6 forward. He's asked you, Rhonda he says: you mentioned in your presentation the challenge of getting the water sector mainstreamed into national development planning. And he asks: why do you think that's been so difficult to date, maybe compared to other development sectors, and what do you think should be done, given your experience?

RHONDA ROBINSON: So for some of the work we've been doing, where we've seen stronger sectoral coordination in the sector happening, we are seeing the connection to the national central government machinery being done in a more strategic, organised, coordinated, resourced way. Where national sectoral coordination is needing support, that's where it's harder to get the central government gains. I mentioned some more in a previous example, I think, and I speak to someone in particular because they've committed to bilateral investments from their development partners to strengthen the national sectoral coordination for water and sanitation, and they've done that over many years and, in doing so, they've been able to better connect with their central and national planning efforts, their SDG reporting and a whole bunch of other stuff that they need to do at the national level.

I think from where we sit here in the Pacific regional space in supporting our countries in this work, that's one of the differences that we can see, where that's happening a lot more, and aside from the fact that the Government agencies themselves are just so busy, and that's a longer piece of strategic work that needs to happen over many years. So it's a combination of those things, I think.

MICHAEL WILSON: Thank you very much, Rhonda. Please, any of the panelists, signal if you want to respond also to any of the questions I'm putting to other people. Wade?

DR WADE HADWEN: I just wanted to add to Rhonda's comment. Disasters are a big problem in the Pacific, and increasingly so, and it does get in the way of governments developing capacity and developing communities and putting infrastructure in place to support the development of communities. We've seen cyclones like Pam rip through Vanuatu and remove a large amount of infrastructure in a very short period of time. And I guess some of those statistics that Rhonda shared around that MDG period, the Millennium Development Goals, and the lack of progress that's probably been made in the Pacific, I think at least part of that lack of progress is the impact of those extreme events. So you may be kind of tipping towards improved coverage of water or sanitation and then a disaster rips it out. So the challenge I think in many parts of the Pacific is how do we keep developing but also have the capacity to recover very quickly from disaster? Because it takes so long to build back in the Pacific region. Here in Australia, if a disaster rips through, we build back quickly because we've got capacity to do so, and I think the capacity problem in the Pacific really represents a challenge. It may take five years to build back that infrastructure, and that really limits the capacity of the region to keep growing.

MICHAEL WILSON: Thank you. Thank you very much, Wade. A very solid observation and, of course, it goes to a lot of the development socio economic development planning priorities that we see Pacific governments advancing to development partners. I wonder whether, Hemant, I might sorry, Kate, you have your hand up. But I think you're on mute.

DR KATE DUGGAN: Of course. Thank you. I'm not sure if this is exactly the right place to raise this but I just wanted to highlight one of the key issues that we come across all of the time in the Pacific and, in fact, I was trying to highlight in some of my comments earlier and that's that and, Michael, I am sure you will relate to this really well in the Pacific the focus has been, and it still is, on WASH and utilities and getting water supply and sanitation facilities to people, and that's completely, as I mentioned, within government priorities because, as Rhonda highlighted, the access is quite low and,

as Wade pointed out, that tends to diminish every time there's a successively large cyclone or storm surge or whatever.

Pacific doesn't show up in those water stress maps so much because you're looking at water abundance generally, but that's changing and it isn't the case everywhere and we are seeing, I guess, more intense El Nino droughts emerging and the modelling showing that drought is likely to become more intense. Populations are also moving towards urban areas, and so population stress on urban water supplies is increasing. So the kind of story of "water abundance, it's all OK" is no longer kind of a viable thing.

So the problem is that while the focus is on supply and getting potable water and sanitation facilities, the lack of attention to water resource management and people have mentioned integrated water resource management and integrated water cycle management is a real challenge because it's really kind of at its infancy in a lot of areas, and we've definitely seen places where wells are going dry, wells are getting contaminated. A focus on what the supply is delivering and indeed what the supply source is delivering into the future and understanding that resource is critical but it's sort of really baby steps.

MICHAEL WILSON: Hemant, you have your hand up.

DR HEMANT OJHA: Hello, Michael. Can I speak now?

MICHAEL WILSON: Yes, please.

DR HEMANT OJHA: Oh, OK, thank you. It's very interesting to hear the observations from other panelists on the Pacific, with the focus on the Pacific. I just wanted to add one reflection. When I started my review from south Asia and then went through east Asian cases and then to the Pacific, what I experienced is that among the data that is available, both published and grey and all kinds of data in the internet, I found it quite limited on the Pacific. I saw that most of the work around water was done around 2008 and 2010 by SPC in partnership with other international agencies. So it looked like there is a fantastic baseline work around that time and then, after that, what I found is isolated, sporadic, in depth academic analysis by some of course, out of their own interest in the specific regions, but not general, cooperative, aggregated information across the Pacific, despite we having all those regional institutions, including the Pacific Community itself and SOPAC and others.

So that was a sort of surprise to me a little bit, and that actually reinforces other panelists' point about strengthening the information base, data base, at one level, and, of course, that is not enough. We need to work at different levels, at national and sub national, and also the socio ecological zone level, i.e., we have to understand that it's really important to look at the risk at the specific sociological zones level where we can see the perceptions and culture of community, how geography works, how hydrology operates in that particular region. So that's really important and that I find even more important in the Pacific, which is so diverse internally. So this is one.

The other one is in response to Abel's comment about two things: the community role and the idea of integration. So what I found in my review of these different solutions is that on one side there is a lot of emphasis at community level, and I believe that this is really important to build up solutions from the ground up, from the community up. But sometimes there is also a sort of romanticisation. Is climate risk and vulnerability going out of proportion? It is also important to work at different levels of government the technology, the investment required, the collective action and effort required to mitigate the actual skill and intensity of the risk; for example, cyclones in the Pacific. It may not be enough to have stronger community at the local level. That is important, but then how we build that community level work at different levels of government continuously is important. So that is one of my responses.

The other one linked to that is: on integration and systems thinking, we all appreciated that this is very important but one problem I have seen is that when you talk about integration systems, these kind of

languages, we shift the knowledge and discourse towards experts and external agencies. And the more complex language we use, the more disadvantaged the local people and communities and decision makers there become. So the challenge is how do we make those complex languages of integration systems, resilience, understandable and actionable to the people at different levels, especially local level? So I am not against the concepts of integration and systems. My challenge is how do we go one step ahead so that these complex languages also become empowering to the local levels. Thank you.

MICHAEL WILSON: Yes, thank you very much, Hemant. This reminds me of something that Wade told me in a conversation we had last week in preparation for this webinar about places to start. I might get his reflections and then get Rhonda's reflections on this. Wade made the point to me that I found quite powerful, and that was that you've got to start with the issues that are important to the local communities you are seeking to deal with, whose permission you are seeking, who you are seeking to help, and that conversation about priorities has to be on their terms.

Wade, would you like to talk a little bit more about that conceptualisation and then I might ask Rhonda to talk about how that translates to policy discussions within Pacific governments and within the Pacific Community and how that narrative is then translated to development partners. Wade?

DR WADE HADWEN: Thanks, Michael. This is a really intriguing but problematic area. There's a bit of a disconnect obviously. When you go and speak with local communities, you get their view of the world and their values and perceptions of risks. Sometimes their perceptions of a particular risk don't necessarily align with evidence from data or other sources, so often it's a conversation around what we know, what we can bring to the table and what their experience and knowledge might be. So we've done some work sampling well water, even just for conductivity, so how saline is that well water, and that doesn't always align with the community's perception of which well is salty and how much. So there is, I guess, a role for it to be a collaborative discussion, and I think that's the way we have to go.

The challenge is you can go from one community on one side of the river to another community on the other side of the river and their experiences and perceptions are really different. It's very difficult then, from a scaling perspective, to go up to a provincial level or a national government policy level, I think and maybe Rhonda can speak to this with more authority than I can but it's hard then to come up with the kind of strategy that works everywhere.

So our experience in chatting with local people and the communities that people live in has been really enlightening to us, and I think it speaks to the point Hemant made as well that data is really scarce in many parts of the Pacific, particularly the remote/rural communities where our projects have been, and it's learning from the people and their stories that's really helped us understand the system. The challenge, of course and I think Kate spoke to this is that we can learn quite a lot about people's experiences and what they've lived through but we know that climate change is going to give us new experiences that no one's lived through before, and so helping communities understand how their risk profile may be changing is really critical as well.

The only other thing I would add is that vulnerability and risk is very much local, so it's hard to make a statement about how at risk a single country is because a single country is made up of so many different geographies and communities, and so I think sometimes when we scale up to the national scale or the Oceania scale, we lose so much of the context that's locally important, both in terms of what the risks are and what the profile might look like for any particular community. So scale is a critical problem that we try to grapple with in the Pacific all the time. I'll pass to Rhonda now.

MICHAEL WILSON: And, of course, this is an issue for every country and central in Australia's struggle with its own climate policy. Rhonda, so how do we reconcile the view from the bottom up with the view from the top down?



RHONDA ROBINSON: OK. Not a big question at all! So, I mean, you're absolutely right, Hemant. The data in the Pacific region is there are gaps. There are issues with the quality and we have recognised that for many years now. The Sustainable Development Goal process has allowed the ability to collect data to be able to report on the SDG, so the two statistics that I spoke to, but that's a fairly well structured process through the national statistics offices, and so they're able to, at the national level, use their own census processes and other things to be able to inform that particular aspect of access. But when you go to the national level, there's no consolidated repository that houses all your climate information, your water quality information, your health information, your water resources information in the one place, or at least in the one ministry, and I suspect that's not uncommon in other regions of the world either, if I'm being honest.

There's an issue around ability to because data gives you a sense of ownership and power, people want to be able to keep their data and have the rights to share their data with whom and when they need to, if they see that they're going to benefit in some way, or the work that they're doing is going to benefit in some way. So there's a whole regional dialogue around the data in and of itself that we continually have across the sectors, and this doesn't only just apply to water and sanitation. Some of the other sectors in the region are probably further ahead than the rest, so like the fisheries sector. They have done work a lot of over many decades to be able to make that data available and accessible, and that's why you see the fisheries data in the region the way it is right now.

We're not there with water and sanitation by any stretch of the imagination. How do we connect up from data to action to policy and down? I'll just maybe go through one example, if I can, and that might help or not. I'm not quite sure. But we talked about water resources assessment and monitoring a little bit in the talk today, and some of the work that we've been doing at a local scale local being island wide or even at a community to island wide is getting a better understanding of the groundwater resources, and our water resources assessment and monitoring team have been doing that particularly in the atoll environments like Kiribati and Tuvalu for a while now. So really understanding the behaviour of those groundwater lenses across a range of different parameters through technical assessments, analysis and mapping those lenses to be able to understand where people can live, from the communities that live sometimes right on top of those lenses or in the surrounding fringes of the lenses, and what they can do with those groundwater lenses.

That scientific assessment has resulted in some practical actions on the national at the community level, island scale level, in countries where we've been able to use it as the basis to inform WASH infrastructure, like community based groundwater galleries, for example. That has allowed those communities to be able to have conjunctive water sources for their daily needs, in normal times and in times of water stress. So we have done that in a community in Tuvalu and some of the other areas in the Pacific in the atoll environments.

The next step from there is that the provincial and island councils that govern the island scale work that happens ideally are able to use that sort of data to practical action on the ground to help guide and inform how they might take that work at an island scale if other partners are coming on board because there's process and there's little governance structures that we've embedded as part of the process along the way, and then that then goes, if all goes well, to the next level up and the next level up and so on and so forth. Now, that's just a microcosm of something that might be an example of how we go from a data to an action, to perhaps island scale policy terms, action planning terms, to maybe something bigger than that down the line.

What often happens, though, is that we're not joining the dots across the full spectrum from science to policy and we're doing bits and pieces, as are partners along the way. That's something we need to get better at as a development community, I feel, in this sort of work we do. I don't know if that made any sense but I'll leave it at that.

MICHAEL WILSON: Perfect sense. Thank you very much, Rhonda. We've had a question come in on the chat related to how we balance questions of water security and access to clean water and

sanitation services with other forms of exclusion, so disability, ethnicity, access to economic resources. Hemant, I know that this has been a little bit of a theme of some of your comparative work across Asia and you may have you may have started applying that experience and thinking to the framework in the Pacific. Would you like to comment on that? How important is it to be talking about different forms of exclusion when we talk about water security and climate change impact?

DR HEMANT OJHA: Thank you, Michael. I think that's a very important question and south Asia is probably even worse, you know, in that aspect of exclusion. Looking at cases of, for example, the water supply system of Karachi in Pakistan, I was really surprised to know that about 40% of the official water is actually leaked and there is a whole informal economy of tanker and people called tanker mafia and all kinds of (inaudible timecode 1.31.35) is around there. And people, especially the poorest people living in the city, they have to buy costly, pricey water from the tanker, these suppliers, and this is true with some of the bigger cities in India as well. And all the way up to Jakarta as well, where the rich people, they invest in deep boring and get cleaner water, whereas the poor people in these poor settlements, they are forced to either buy costly, pricey tanker water or use whatever contaminated water is around there.

So I think in organising Asia, exclusion is most visible in the context of urban water and sanitation. Of course, there are other areas as well, but you don't need to go and dig into the data, and especially when contaminated water leads to cases of diarrhoea (inaudible 1.32.50) and ill health and all kind of (inaudible 1.32.50) impact and it's very easy to see this exclusion. So the problem is there, and this problem is being gradually recognised at the national level as well, the national policy aiming to improve water access. And India has ruled out a national sort of program, very large programs, and other countries have also done in the same way.

But I think again, as discussed earlier, it required solutions at multiple levels. Exclusion is happening at the household level as well. A lot of community level action research that I have done in south Asia you know, what I find is that within the household itself, it is primarily the women's responsibility to manage water and a lot of times men don't know where from water comes and how it is managed. It is all women's workload and responsibility and all those sort of things. So this exclusion dimension exclusion has multiple items/standards, (inaudible 1.34.06) socioeconomic and (inaudible 1.34.06), and then it operates at different levels. And water security alone cannot solve all the societal exclusions. It requires coordinated input across different sectors. But I think water security is a really important factor with those really critical issues and impact around health and all those things that becomes visible to the politics and political domain. It can be a really important sector to capitalise inclusive, you know, development in those regions. Thank you.

MICHAEL WILSON: Yes, Wade, you wanted to come in on that?

DR WADE HADWEN: Yeah. Thanks. This is a really important topic. I'm actually on a Water For Women grant at the moment where we're looking at the role that tourism can play in improving gender equity, disability and social inclusion. Particularly since in the Pacific tourism is such a big part of the economic development of the region, we see there's opportunities to improve the livelihoods and outcomes for local communities when resorts come in and develop resources, but also training around appropriate WASH behaviours. So our project's trying to unpack how tourism is a big user of water and a big generator of waste, which creates some problems, but also how it employs local people and can actually support the development of local communities around sanitation and water resource availability because often there's a big disparity in terms of water sources are being used and what sanitation and hygiene systems are available .

So hopefully we can see some water stewardship from sectors like tourism, where they can explore opportunities for not just looking after their own house but looking after the destinations, so the location and the local community that they employ so many people from. So I just wanted to add that

in there, that it is something that the water sector, through sectors like tourism, can play a really important role in closing the gap on some of those shortfalls.

MICHAEL WILSON: Thank you very much, Wade. We have a question in from Selina about the importance of finance ministries in the setting of priorities but also the resourcing and coordination of on the ground work, and certainly in many of the development partner conversations that happen in Asia, where I have most of my development experience, the finance ministry is actually the lead interlocutor. I wonder the extent to which that happens in the Pacific or should happen or the conversation should be happening more with finance ministries, and I think another specific initiative coming out of the 2015 UN Summit, which established the Sanitation and Water For All Campaign, chaired by Australia's former Prime Minister Kevin Rudd, but that deliberately brings both water ministers and finance ministers into the conversation about water security. Rhonda, what are your reflections on that? And, as development partners, have we been getting it wrong? Have we been not talking to the complete set of influences?

RHONDA ROBINSON: Thanks for that. And we've been having this dialogue over the last 15 months following on from the call to action and before that about how we might progress the water and sanitation agenda, and the finance dimension is definitely one of the angles that we're talking about. I see comments on the question and answer chat box about how do we raise the profile with leaders and the rest of it. So one of the angles on the finance perspective is this you have mentioned the Sanitation and Water For All initiative. Papua New Guinea is a country that has recently signed up to the SWA initiative. It is fairly heavily supported by the World Bank as well, as a development partner in the region, and that is an opportunity.

Within the forum processes in the Pacific, the Pacific Island Forum processes, we have what's called a Forum Economic Ministers meeting and they have several standing agenda items that talk to specific issues, so you could take, you know, the water and sanitation dialogue through that mechanism as well. So there are opportunities to engage at the regional and the global level around the finance and WASH discussions. What we're seeing less of, though, is that support at the national level, where we're trying to encourage and enable and facilitate that national level dialogue between the finance ministries and planning ministries and the water and sanitation work that's happening on the ground. And that's something where we're also trying to work through from the SPC side. So just a few comments from me on that one.

MICHAEL WILSON: Thank you very much, Rhonda. That's excellent context. A question now on the chat around whether the opportunities presented by the region's recovery from COVID 19 presents perhaps a once in a generation potential to direct resources and attention to building back better on a climate change from a climate change perspective, including on energy efficiency and mitigation. Kate Duggan, I wonder whether you might comment on that and perhaps whether the programs you're currently involved in are thinking about whether COVID 19 has sort of accidentally provided a new opportunity to reset some of those discussions.

DR KATE DUGGAN: Thanks, Michael. Well, we hope so. Like everyone, we have had to think quite a lot about COVID 19 and the way that it intersects with our work. I'll talk about a couple of things. One is that we've done quite a lot of analysis of the impacts of climate change on health in the Pacific region, in each Pacific country, and, of course, that has a lot to do with water borne and vector borne diseases but also basic health, nutrition, from a very early age. I guess what we have found is that the kind of interventions that you would make to make a difference are the sort of interventions that would strengthen the health system anyway, so things like improving access to good sanitation and hygiene and potable water readily to all communities. So there's that. If you strengthen what's there, then you're going to be better prepared for something like a pandemic in terms of health system and in terms of the impacts of climate change, so there's a bit of commonality across that.

But, more broadly, we've tried to and this is the second thing tried to have the conversation about what would the development pathways look like going into the future, COVID recovery, economic

recovery, that is also going to be positioning people better for a climate future climate change future. And they're things like people have touched on it the amount of damage that's caused by a cyclone. So resilient infrastructure, It isn't really as hard as it looks. A lot of other countries and situations have been testing it out PNG, Solomon Islands, Vanuatu. We're looking at resilient infrastructure, so infrastructure that can withstand a lot more of the threats that are accumulating.

Renewables is kind of a no brainer for the Pacific really, even though there are some significant hurdles and barriers. That would provide a certain opportunity in terms of employment, economic growth, because it can also work at a distributed level. So you don't need to be connected to the grid. You can actually have workable energy systems in remote and rural locations that are also powering health centres, powering schools, powering households, and they could be managed locally through tariff systems that actually enable that to be maintained. We are trying to have those conversations about development that positions people better for both the pandemic and a climate future because certainly we are seeing those pressures coincide, like right now.

But I wanted to also kind of touch on something, if I really quickly could. The elephant in the room in the Pacific around water supply and sanitation I am sure everyone is aware of it is this extraordinary failure rate that we have in terms of delivering WASH to communities, whether it's urban or rural, and I think one of the big opportunities is to sort of have a better understanding of what that is at a system level, what is causing that and how can it be better tackled in little projects like the Water For Women grants, the myriad activities that are out there, still doing, still keeping on, still going, but in the face of this particular failure rate. I was in a conversation with the Permanent Secretary who is responsible in the Solomon Islands. Mind you, you know, you don't have Ministers for Water so much in the Pacific, but he's in the area responsible. And he talked to me about banning all future donor activity in WASH until these problems could be fixed. So, to me, that is sort of like number one problem opportunity with all of the expertise available through the Australian Water Partnership and Pacific partners that could bring to that. So sorry for segueing but I thought I'd just take that opportunity while I could.

MICHAEL WILSON: Not at all. I love it when country governments take control of the donor discussion that way. I think it's tremendously helpful and it does shine sometimes an uncomfortable mirror on the sorts of on the sorts of platforms that we've created as development partners I think with the right sort of will but with tin eared instincts.

I'd like to just raise well, it's actually something that comes through in Hemant's research but I'm going to put the question to Wade, and it's this fairly obvious fairly obvious thing where we as human beings tend to focus on technical responses to some of the water security and climate change problems that are thrown up at us, when actually some of the simplest solutions, some of the low hanging fruit, are political issues, political problems that we should solve, and yet we continue to confuse the two, and that, in turn, influences the language we use with decision makers about what is within their control and what is in the control of experts technical experts or scientists. Wade, do you have some reflections on that, particularly from your interdisciplinary approach to these problems?

DR WADE HADWEN: Thank you, Michael. Certainly, the technology side of things, the technical fixes that we've got in our toolkit now you know, there's a lot of different systems and technologies that we can apply to solve problems on any sort of scale. And certainly some of the approaches that are taken to things like sea level rise or storm surge protection, it's just build a big sea wall, so I know that there are some nations adopting that approach, building big sea walls around their islands.

The challenge with those sorts of approaches is they intercept a whole heap of ecosystem service flows, so fisheries and coral reef health obviously get impacted when you build a big wall around things. So I'm concerned sometimes when we jump to, I guess, the low hanging fruit, the sort of best well known technical fix, without really fully understanding the local context and having a deep conversation with the local people. I know less about the policy and politics at the higher levels, but certainly at the local level, people don't typically want a sea wall in front of where their village is. They

want to understand what the threats are and have a discussion around what they might be able to do, including all of the engineering solutions but perhaps including some behavioural changes that they may be able to implement. I am not at all saying that behaviour change is easier to do than engineering. In fact, it's probably much harder. But I think part of our toolkit needs to be broader than an engineering solution. My biggest concern with engineering, of course, is that it's built to specifications, and once those specs are exceeded, it's usually quite catastrophic. So once that sea wall breaks, what happens? And once your desalination pump or filter breaks, what happens?

So I think we need a more nuanced understanding of what the risks are and a more holistic approach to look at a range of different tools that can help solve some of those problems, and those tools may change through time as well as situations change. So I don't want to lock us into any particular activity or approach. We need to be flexible and nimble. I think COVID has taught us that but we need to probably continue to adopt that sort of approach going forward as well.

MICHAEL WILSON: Great. Thank you, Wade. Hemant has his hand up, and given it was his research that I introduced, we should let him have a right of reply. But, Hemant, I would also like you to explore how we use language. In the essence of the applied research and action oriented nature of the Australian Water Partnership's work, what is the power of language with decision makers when talking about these things? To what extent do we introduce impassioned language or do we need to work hard to keep emotion out of it and keep the discussion fiercely objective?

DR HEMANT OJHA: Thank you, Michael. Well, we all know our language is a tool for knowledge, right. And I remember one study we did in the Himalayan region to compare scientifically measured change in climate and then people's perceptions at the local level by conducting a large sample survey from the national database. And our conclusion is that a lot of local perceptions do not match with what scientists find by observing long term trends in the climate related phenomena. So it is really important to recognise and acknowledge the strengths and limitations of both science and local knowledge.

So what becomes important then is to create platforms for negotiation, deliberation and core learning. So, at the moment, my analysis and experience, mostly in the south Asian region, is that this whole work of international development also has some limitations. Because of project cycle, management cycle and all the systems and procedures of accountability and reporting, there is sometimes a missed opportunity to really engage with the local agents of change, and sometimes what we do from international level (inaudible 1.51.34) is we take unnecessarily and disproportionately and even unrealistically too much of the agency and burden of change in different localities, which is not at all possible.

So instead of taking all that burden of change, we could help and we could do more with identifying local agents of change. In a lot of situations, how positive change has come you know, we can easily look at in the case of Singapore, of course, that is an outlier in relation to water security. And one single important factor that many scholars who have studied the Singapore case of water development is the political leadership commitment and integrative management, all of which came from the top. And then also our fantastic partnership work between Singapore National University, Institute of Water and other related departments and the Singapore water supply agency, so all those kinds of partnerships.

So, in all of this, what I am trying to say here is the agents of change, not just at the organisational level but also at the individual level. You know. Sometimes within civil society there may be few individuals who are really committed and who have the capability to drive change, so it's really important to engage with them beyond organisations.

So language and knowledge are actually tools to engage and combine, you know. Different knowledge systems. So I think that this is what I have at the moment. I can come back later.

MICHAEL WILSON: Thanks very much, Hemant. We have about five minutes to go and what I've been trying to do is summarise some of the themes of questions coming through on the chat. I hope I've done that relatively adequately. Others we won't be able to get to. With an audience of, I think, around 120, it's always it's always a challenge to get to everyone's questions. But I would like to give members of the panel now a brief opportunity in our last five minutes to ask questions of each other. Please just raise your hand if there's a thread of the conversation you would like to continue obviously in public with fellow members of the panel. Right. Nobody is seeking the floor. Oh, yes, Kate, please.

DR KATE DUGGAN: Couldn't miss an opportunity. I just have a question, Hemant, about the research that you were talking about, that you have been doing across Asia and the Pacific, in terms of looking at the water sector and understanding it. Acknowledging that there are enormous data gaps, and still in the networks, in the data collection networks, they persist. Can you describe a little bit what that is actually covering and how do we get access to it?

DR HEMANT OJHA: Thank you very much, Kate. So the review that I'm doing in partnership with AWP is understanding how this climate risk is manifested in different socio ecological zones. So I have picked up 11 different localities. Earlier I talked about Karachi. So Karachi is one. It is, of course, a city politically but also a socio ecological zone, located close to the industry borough and close to the sea as well. So, like that, I picked up other cases Chennai in India. It's actually had drought two cases of extreme drought and flood within a period of 2.5 years. So all the way to Pacific where I have picked up some cases around PNG and Vanuatu. And then Singapore itself is a best case of water security, as I mentioned earlier. And the situation of Mekong Delta, Jakarta, the city area, and then in between Myanmar dry region as well.

So I tried to look at what is available in the literature, both with grey and published, academic and non academic. I tried to understand how risk is being manifested and what should the predictions be for future, and then what people and governments are doing on the ground and what can we learn, moving ahead, to improve water security in those different localities and then also trying to aggregate some lessons and strategies at the regional level as well. So in that case it is a multi scaled work but all within the limitations of what is available as published, and grey literature, and the report is being finalised and then we will be maybe in a position, after I submit the final version, that may take a few weeks, maybe a month to publish it. This is what I can say, yes, just in terms of timeframe. Thank you.

MICHAEL WILSON: Thank you, Hemant. And, yes, it is our practice to make all of our research public, all the research action research that we commission public. So we're working on finalising that at the moment.

I think Rhonda deserves the last word, and, Rhonda, I'd like to ask you: for those AWP partners who've been watching on this webinar today, they've now got a greater deal of awareness about water security issues faced by the Pacific and are excited about the prospects of working in the Pacific more, or, if they haven't done so in the past, doing so in the future. What are some of the information resources you would suggest to our partners to gain a better understanding of the challenges that you face?

RHONDA ROBINSON: Thank you for that, and also for giving me the chance to say something before we wrap up. We have on our SPC and divisional website, we've got some web based information that you can get off that website directly, so it's the GEM website, Geoscience, Energy and Maritime Divisional website, which has a lot of information that we're working on at the moment in terms of active project work. And separate and apart from that, if there's specifics around some of the areas and examples that I spoke to, feel free to reach out to me directly. I know there's 120 people who logged on, so I hope I can manage to be able to respond to at least the key questions you might have, and I'm happy to do that following this.

I would also like to encourage people, if I can, to have a look at our Pacific Resilience Partnership platform, which is part of our work in the region to integrate our disaster and climate change agenda. We also run webinar series as part of the Pacific Resilience platform that talks around some of the on the ground experiences that our Pacific Community is having at the moment. Those webinars have been recorded and you can get them off the Pacific Resilience Partnership website. So I would encourage you to go and have a look at that as well, if you can. That's it from me. Thank you. Vinaka.

MICHAEL WILSON: Thank you, Rhonda. So Rhonda Robinson, Kate Duggan, Wade Hadwen and Hemant Ojha, I would like to thank you all very much for being a part of our panel for the discussion today. Thank you, everyone, who has joined online and we will try and follow up some of those questions we weren't able to address in the session today. If you have any other questions, please feel free to email the AWP. Our address is [contact@waterpartnership.org.au](mailto:contact@waterpartnership.org.au) and we will be providing further information on our seminar series upcoming in the lead up to our partner workshop from the 5th to the 7th of August, probably in Adelaide. Please follow us up on social media and via our website, [www.waterpartnership.org.au](http://www.waterpartnership.org.au). Thanks, everyone, for attending and we'll see you soon.

DR WADE HADWEN: Thank you very much. Bye bye.