Water Climate Discussion

Photo WaterAid/ Basile Ouedraogo

ADAPTATION & RESILIENCE

Report from the discussion held on 13 May 2021

edited by: Laura Fonseca, Jane O'Connor & Neil Edwards

organised by:

ice
Institute of Water

ROYAL SOCIETY OF CHEMISTRY

IChemE
Institution of Chemical Engineers

Royal Society of Biology

IWA
the international water association

SocEnv
Society for the Environment

BRITISH WATER

Water UK

WaterAid

"water is climate"

Welcome

The Water Climate Discussion series is creating a space to come together and help the water sector build its leading role addressing the climate crisis.

The series is the result of close collaboration between water institutions who have come together recognising climate change as an existential threat and wish to have a voice promoting a key message: water is climate.

This report has been produced based on the discussion lead by Lucien Damiba from WaterAid, Trevor Bishop of WRSE and the participants' interaction during the first discussion of the series: Adaptation and Resilience, on Thursday, 13 May 2021. Chapter numbers refer to chapter markers in the [video recording](#) of the discussion.

A water monitor testing a new rain gauge in her village in Burkina Faso - Photo WaterAid/ Basile Ouedraogo

Lucien Damiba

Lucien is a Regional Research and Knowledge Manager at WaterAid, based in West Africa. He is responsible for research, knowledge management and climate change in the region.

WaterAid

Trevor Bishop

Trevor is the Organisational Development Director for Water Resources South East (WRSE) will be leading the discussion on water adaptation & resilience in areas like the South East of England.

wrse
WATER RESOURCES SOUTH EAST

Lucien posed three questions to the participants

1
Data: What data is missing and how can we get and use it?

2
Recharge: What else can we do to maximise aquifer recharge?

3
Promote: How can we promote water as the key COP26 challenge?

Trevor posed three questions to the participants

4
Reuse: How can reuse at scale be made acceptable to customers?

5
Prioritise: How do we prioritise water use between sectors?

6
Change: How can we better engender change and share learning across the water sector?

WaterAid Burkina Faso video: Securing water resources and reducing vulnerability to water stress

"Water is life; climate change affects life."

Following the WaterAid introductory video (Chapter 2), Lucien introduced the concepts of vulnerability, adaptive capacity and WaterAid actions towards identifying and monitoring water stress to implement adaptation strategies tailored to each location.

Later, Lucien shared an explanatory video presenting the adaptation challenges that people in Burkina Faso, West Africa, are experiencing, and their efforts towards resilience (Chapter 5). He highlighted the need for more rapid innovation to better capture and use the 205 Billion m^3 of water available per year in the country for aquifer recharge, so that it could be used by the 60-70% of population who depend on groundwater.

Some technologies currently used were discussed in Chapter 7, such as sand dams, storm bands and half moons.

A sand dam constructed across the riverbed. The sand dam is used to improve water retention and recharging of groundwater in Burkina Faso - Photo WaterAid/ Basile Ouedraogo

Alongside the discussion, Lucien posed the following questions to the participants:

1. Data: What data is missing and how can we get and use it?
2. Recharge: What else can we do to maximise aquifer recharge?
3. Promote: How can we promote water as the key COP26 challenge?

To close his segment, Lucien emphasised how water is key to adaptation and resilience to climate change with his statement: "water is life; climate change affects life".

Regulators' Alliance for Progressing Infrastructure Development

A video presented by Paul Hickey, on assignment from the Environment Agency, as leader of RAPID, in Chapter 16, outlined several ideas themed around building resilient water supplies.

Paul talked about the commitment by the government and regulators, amongst other actions, to regional planning and the setting up of a new National Framework:

- Increasing resilience to 1:500-year events to be achieved in 2030's
- Formation of RAPID (Regulators' Alliance for Progressing Infrastructure Development) overseeing new supply schemes

"We all share these catchments and these basins, and we need to do planning together."

Trevor Bishop started his segment explaining the objectives and activities of Water Resources South East (WRSE) in Chapter 14, and what WRSE are doing differently (Chapter 17), including three core characteristics for the management of resilience: reliability of options and systems, their ability to adapt and their ability to evolve.

"First of all, the big transformation we're doing is moving from a very traditional risk-based approach to a resilience and adaptive approach to planning for long-term investment to maintain security of supply in the economy to make sure we have a thriving environment for the future. "

Trevor noted that increasing capacity is not enough to deal with resilience and adaptation.

In Chapter 18, he talked about a mix of strategies such as managing down the demand for water, diversifying water portfolio and implementing semi-closed loops by reusing water.

Chapters 19 and 20 give further details on desalination challenges, the need to evaluate reuse strategies against a single
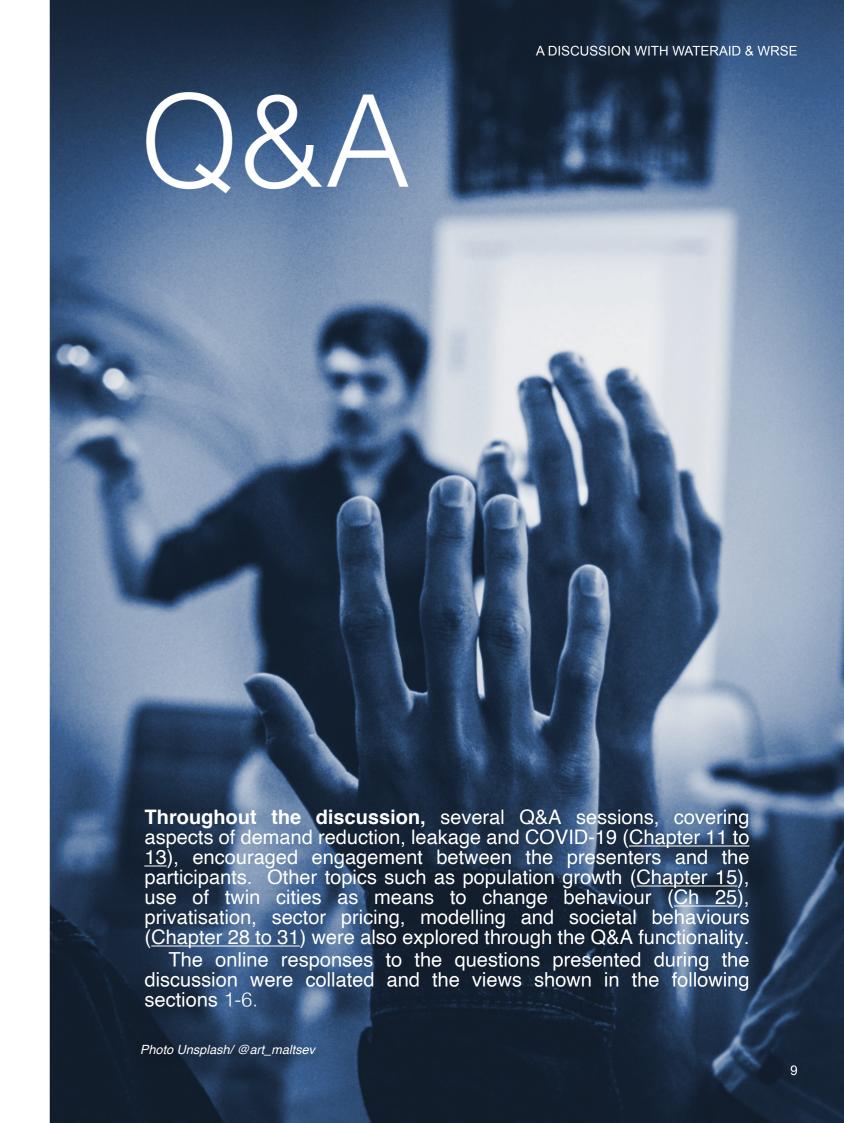
resilience framework and equally importantly, the involvement of society and politicians to understand what is best for all and to recognise how perception of water reuse is changing.

As a concluding remark, Trevor suggested that understanding the natural environment as a system and how resilient it is, can help to take a systems approach while planning, for instance, network and connectivity capacity linked to future water resources. This planning needs to involve all

different sectors and will guide the conversation around prioritisation.

During the discussion, Trevor challenged the participants with the following questions:

4.   Reuse: How can reuse at scale be made acceptable to customers?
5.   Prioritise: How do we prioritise water use between sectors?
6.   Change: How can we better engender change and share learning across the water sector?

Q&A

Throughout the discussion, several Q&A sessions, covering aspects of demand reduction, leakage and COVID-19 (Chapter 11 to 13), encouraged engagement between the presenters and the participants. Other topics such as population growth (Chapter 15), use of twin cities as means to change behaviour (Ch 25), privatisation, sector pricing, modelling and societal behaviours (Chapter 28 to 31) were also explored through the Q&A functionality.

The online responses to the questions presented during the discussion were collated and the views shown in the following sections 1-6.

Photo Unsplash/ @art_maltsev

1. Data

What data is missing and how can we get and use it?

Participants' responses to the question of missing data are shown in Figure 1.

Open data or free access were considered in 23% of participants' replies and goes hand in hand with the need for analysis, mentioned by 17% of the responses.

Access to data can be used to empower communities and support them to interpret their data and find solutions to local challenges. Moreover, involving communities can add a different perspective to any data that has or is being monitored, their empirical observational skills developed over generations can give specific, local context and meaning.

Another vital aspect related to open access data is its importance to assign a value to water availability. Data sharing will help the public perceive how valuable this resource is, develop solutions that reduce their water usage and make them aware of leakage risks.

Neil Edwards argues in favour of data availability: *"Robust approaches to evaluating priorities for competing demand at times of scarcity (benefits assessment both direct and indirect including 'environment') will flow into Responsible Investment approaches."*

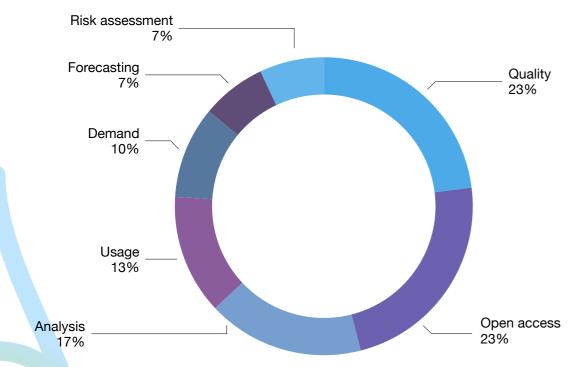Other views submitted by participants include the need to gather data for water quality (23% of responses), water usage and water demand.

These data should be collected and interpreted using GIS mapping (Geographic Information System) and should be key to short-, medium- and long-term forecasting coupled with risk assessments. A key benefit of this particularly, is to develop projections of deterioration in raw water quality so that future treatment capacity and technology can be developed.

"We monitor wells & pumps, and discrete locations. In-pipe monitoring of used and clean water distribution networks is needed - to reduce leakage and understand where the problems are in a holistic manner. We need to monitor the whole cycle in an integrated way" - Louise Keogh.

Figure 1 - Participants' responses to Question 1: how to find and use missing data

2. Recharge

What else can we do to maximise aquifer recharge?

Most participants considered that aquifer recharge and reuse are interconnected, such as grey water reuse.

Other ideas include:

• Treating run-off from roads [Rob Bradley]

• Implementing infrastructure for water harvesting, significantly increasing the number of small local sand or stone dams, since even small dams will have a significant benefit to retain water to prevent runoff [Leonard]

• Modelling water use and flows from source to the consumer, to manage them accordingly [Salman]

• Managing wetlands and prevent land encroachment in the tropics [Salman]

The water drawn from the hole dug in the sand in the riverbed crossed with sand dam is being stored in some containers in a garden in Burkina Faso - Photo WaterAid/ Basile Ouedraogo

3. Promote

How can we promote water as the key COP26 challenge?

The participants' responses to Question 3 are shown in Figure 3.

One popular response, for 32% of participants, was to adopt the #Water is Life or #Water is Climate strapline in lobbying and raising awareness. These straplines have been used to market this discussion series and will be used to market the future planned online discussions and conference.

Elena Egidio commented that we are already promoting the message that "climate change is water crisis".

"climate change is water crisis"

A significant number of participants, also 32%, believe that raising awareness of global differences in water consumption will promote water as the key COP26 challenge.

Caitlin Cordelia Van Abeelen proposed *"studies that include real life stories of using water in low resource settings and how that would look on a daily basis in high resource settings."*

Similarly, Emma Ash suggested a visual display of the average per capita consumption of water in Scotland, at COP26 in November 2021, to raise awareness of water efficiency and costs to treat water.

21% of participants focussed on the economic reasons to act now to mitigate the impacts of the climate crisis and to avoid a much greater water crisis in the future.

Neilaquainform proposed *"a short, compelling visual story showing globally the development of a water scarcity index over the next few decades, and in parallel, the developing global $ bill to address if no action is taken."*

Investing now in climate change mitigation was seen as the *"sound economics of keeping safe and secure water systems running"* by JHolbrook.

#Water is Life

#Water is Climate

Another idea to promote water as the key COP26 challenge was to link availability of wholesome water supplies and provision of sanitation to health and to economic development at a local level.

In addition, collaboration across industries, e.g. agriculture, food production etc., and their dependency on water, was an alternative idea to promote water as the key COP26 challenge.

Figure 3 - Participants responses to Question 3: how to promote water as the key COP26 challenge

4. Reuse

How can reuse at scale be made acceptable to customers?

The question of the acceptability of water reuse generated a wide range of responses from the participants, shown in Figure 4.

The greatest number of participants, 34%, believe that education of customers and wider society is the solution to making water reuse more acceptable to all.

A further 14% of participants believed that promoting the safety and benefits of water reuse would provide that assurance needed for wider acceptance of water reuse.

Jak219 observed that demonstrating the benefits of water reuse, both economically and to security of supply, and then proving this with use in agriculture etc. should improve acceptability.

Graphic andeye/ Laura Currie

14% of participants agreed that there were opportunities associated with indirect water re-use, i.e. in aquifer recharge or abstracting downstream of highly treated sewage effluent.

Examples such as the Langford Water Recycling Plant were shared to show how such projects can be successful when issues of perception and acceptability are discussed openly with stakeholders, to build trust and educate on the benefits and safety of these installations.

SWaugh commented that *"indirect re-use like the Langford Water Recycling Plant operated by Essex & Suffolk water has public support"* and neilaquainform advised of the need to first promote awareness of just how much water is already supplied through indirect re-use e.g. in lowland rivers in England a significant proportion of flow, at low flow, will be derived from wastewater discharges. Indirect water reuse could be the optimum starting point to generate public acceptance of wider water reuse.

Similarly, 17% participants highlighted the opportunities to focus on water reuse for commercial or industrial supplies (non-household suppliers). This is already widely acceptable in Singapore (NEWater) and applying the learning from Singapore, focussing on water reuse for industrial applications to build wider acceptability, as proposed by SimonMFuller.

A smaller proportion of participants, 10%, proposed customer incentivisation to gain acceptance for water re-use. Their suggestions included metering with water reuse tariffs and real time quality monitoring for water reuse applications. Another idea
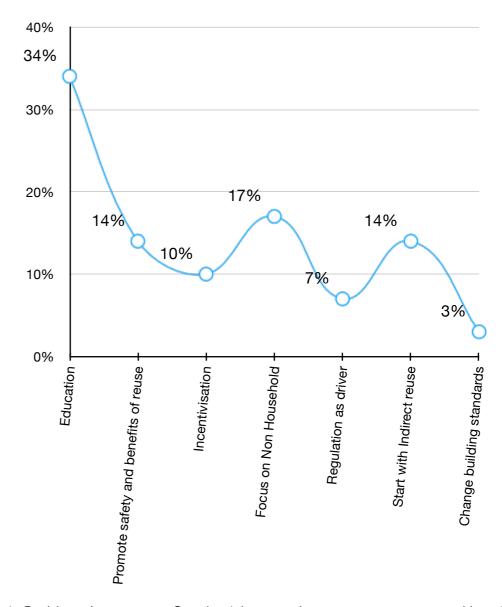

Figure 4 - Participants' responses to Question 4: how to make water reuse more acceptable to the public

from Rob Bradley and others, identified *"aligning carbon savings with reuse through regulation changes"* as a means to improve water reuse acceptability to customers. Acceptability by regulators would be essential to promote acceptability in the wider population.

Finally, 3% of participants proposed changes in building standards to make water reuse more acceptable, even compulsory, in a domestic "grey water" recycling scenario,

and this would bring significant gains in water efficiency for new developments.

One participant answered, *"I think there is need for education. Issues outside the cities seem very distant from day to day water use. How my behaviour in a city can help people whose well is draining in another continent? What can be my action as an individual? Is reuse the answer?"*

5. Prioritise

How do we prioritise water use between sectors?

Figure 5 shows participants' responses to question 5.

Responses highlighted three broad themes linked to 'prioritisation', namely means of achieving allocation, objectives associated with allocation and 'purposes' with more than 50% of responses dealing with mechanisms.

Participants identified administrative allocation as a principal means of determining priority in water allocation. A significant minority suggested alternatively or additionally using markets. Several participants, favouring administrative means, identified critical roles for governments and regulators (eg planning), though one explicitly opposed roles for government or markets.

Some participants felt that determination should be at community-scale and delivered through empowered, possibly autonomous, societal groups representing local population, industry and services, gathering and understanding their own data and determining prioritisation appropriate for them.

Many participants suggested that value or benefit should have a role in prioritisation with the suggestion that the value of water is not always evident to users. This could be a basis of administrative allocation and could also be achieved through the use of markets.

One participant suggested a blended approach, using administrative initial allocation of rights with secondary markets to achieve dynamic redistribution of both the rights and the water associated with those rights, to seek improved economic efficiency as conditions varied.

Only one participant identified 'environment' explicitly, though environment can be taken to be included within 'value' (which need not be exclusively monetary).

Several participants suggested factors which should influence prioritisation of allocation including 'purposes' such as preference to drinking water supply, or to purposes with low carbon emission consequences or in relation to 'objectives', including incentivising water use efficiency and to promote autonomous communities or achieving local public-private partnerships.

In wider discussion, it was suggested that water allocation determinations should take place within an adaptive planning framework representing an appropriate 'system' capable of delivering resilient and evolving 'solutions' responding to variability and uncertainty, including that associated with climate change.

Seeking to manage down water demand would generally ease pressure on the system (and GHG emissions) though recognising that optimisation of water use in the holistic system may be desirable rather than always driving to minimise use, and that new water uses would emerge, not least associated with purposes addressing the challenges of climate change.

Allocation frameworks should be sufficiently holistic to allow integrated assessment of the range of influences, (eg abstraction, wastewater discharge, environmental state, flooding risk, etc.), hence allowing the pros and cons of options such as semi-closed loop, reuse, recharge and desalination to be soundly evaluated.
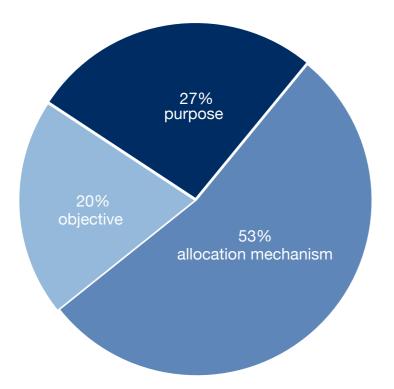

Figure 5 - Participants' responses to Question 5: how to prioritise water use between sectors

6. Change

How can we better engender change and share learning across the water sector?

There is a clear role for education in engendering change and sharing learning about water and the aquatic environment. This includes the formal and informal, within schools/universities and wider, through mainstream and social media.

Global messages need to be expressed in terms that are meaningful in local circumstances, recognising local problems and solutions, local politics, culture, custom and practice, etc.

Sustainability and water awareness should become instinctive and expected. Promotion of holistic and integrated thinking and planning should replace traditional silo-thinking. Water is not the water industry's problem – it is a global challenge for us all.

"What we've also done, is brought the other sectors in, so we're planning once for everyone involved with water, whether it's clean or wastewater together, so we do a plan which is integrated. We have to stop planning in silos. We all share these catchments and these basins, and we need to do it together," Trevor Bishop.

Participants suggested that improved data quantity, quality, scope, cost and accessibility may be helpful (e.g. through use of publicly available, free databases supported by compelling visual stories through GIS and story maps).

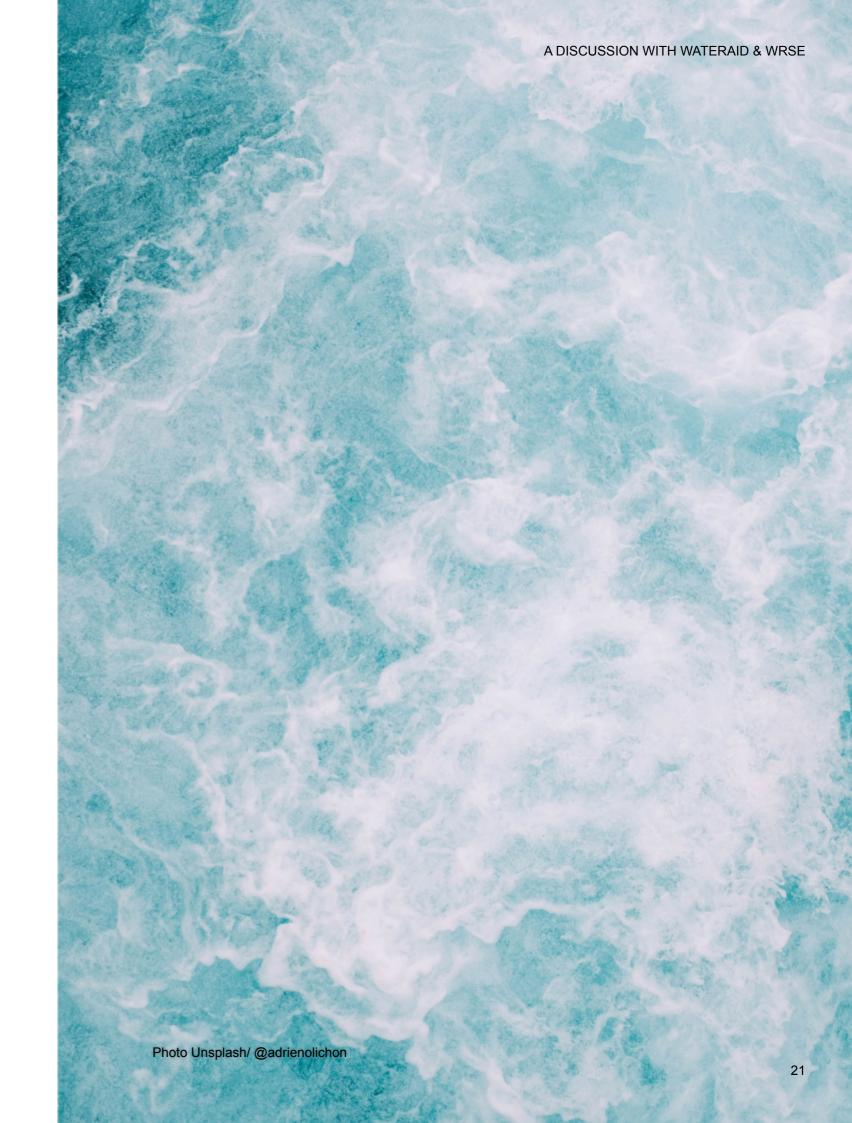Better awareness of costs, values and benefits may influence behaviour and preference.

Inclusion of the embedded knowledge of communities, acquired through generations, as well as citizen science may promote engagement.

Several participants suggested means by which messages could be conveyed:

- Twinning arrangements could promote awareness of problems and solutions elsewhere in the world and cut across economic strata.

- Introducing temporary restrictions could promote awareness and behavioural change.

- Individuals need to be helped to understand how their choices and actions today in one part of the world can exacerbate or ease water problems experienced elsewhere in the world in the years to come.

Establishing suitable factors with responsible investment initiatives (or requirements) could nudge or force change in investor appetite leading to change 'on the ground'.

"Water is not the water industry's problem – it is a global challenge for us all."

You can join the discussion
in the next of the

COP26
Water Climate Discussion Series

If you enjoyed this Adaptation and Resilience discussion with WaterAid and WRSE, then join us for future events in the COP26: Water Climate Discussion Series:

Nature Based Solutions
With IWA, Water UK Jacobs and Severn Trent Water
on Thursday 10 June 2021 from 9-10am BST

Further events based on the COP26 themes are planned as follows:

Energy Transition	**1 July 2021, 9-10am BST**
Clean Transport	**5 August 2021, 9-10am**
Finance	**2 September 2021, 9-10am**
Water Climate Discussion Conference	**7 October 2021, 9am-5pm**
Live from COP26	**TBC November**
Conclusion and Next Steps	**1 December 2021**

Please register through any of our collaborators' links:

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We're looking forward to your input.

Let's change the world together.

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