CITY-WIDE WATER AND CLIMATE RESILIENCE THROUGH WATER SENSITIVE DESIGN AND PLANNING (WSDP)

INTERNATIONAL VIRTUAL TRAINING PROGRAMME, JANUARY / FEBRUARY 2022

Part A: Pre-training material on Moodle e-learning platform (self-study, 25 January to 1 February 2022)

Before virtual sessions are conducted, participants will be provided with a list of **'Essential'** and **'Recommended / Supplementary'** reading and audio-visual material. It is expected that the 'Essential' reading material will take participants about 10-12 hours to complete, with a focus on the following themes:

- Introduction to 'Sustainable urban water management': Focus on challenges in the water sector wrt climate change in South Africa / Africa; Centralised *vs* Decentralised water services; etc. *(provided by WRC, CSE)*
- Need for Water Sensitive Design and Planning (WSDP) to build urban climate resilience: Brief overview of the urban water crisis and opportunities for building water resilience *(provided by UCT, WRC)*
- Introduction to WSDP concepts, including rainwater harvesting (RWH), Sustainable Drainage Systems (SuDS), Decentralised wastewater treatment (DWWT), on-site sanitation, reuse etc. *(provided by UCT, CSE)*
- Framework for implementation of water sensitive spatial planning strategies in South African cities *(provided by UCT, JLL)*

An online discussion forum / feedback session will be arranged at the end of the pre-training week, to engage with the participants prior to the virtual sessions. The material will also be supplemented with a '*Pre-training assessment*', in order to gauge awareness and knowledge of WSDP concepts amongst participants. The assessment (to be completed in the form of a quiz) will need to be submitted via Moodle by 9am on **Monday 1 February 2022**.

Live online sessions

1. Orientation / Introduction to course including background to why training is needed (Mr Jay Bhagwan & Ms Shanna Nienaber, WRC; Dr Suresh Rohilla, CSE) – *presented live during a virtual Zoom session at 9am on 25th January 2022*
2. Online discussion session – feedback on pre-training and instructions for facilitated training (A/Prof Kirsty Carden, UCT / Mr Dhruv Pasricha, CSE) *presented live during a virtual Zoom session at 9am on 1st February 2022*

List of recorded lectures and selected documentaries (including name of presenter plus estimated time to complete)

1. *Lecture:* Setting the context for South African water challenges – Dr Kirsty Carden, UCT (30 min)
2. *Lecture:* WSD for South Africa: Framework, guidelines and policies – Dr Kirsty Carden, UCT (60 min)
3. *Lecture:* Sustainable Drainage Systems (SuDS) and stormwater harvesting – Prof Neil Armitage, UCT (60 min)
4. Decentralised wastewater treatment (DWWT), on-site sanitation, reuse – CSE
5. *Documentary*: Showcasing Best Management Practices of WSUDP
6. *Lecture:* Framework for implementation of water sensitive spatial planning strategies in South African cities – Dr Hildegard Rohr, JLL (60 min)
7. *Documentary* – The Future of Water: story of Windhoek (15 min)

8. *Documentary* - 'Designs that hold water' - Sustainable drainage systems explained' by EA, UK & Leeds City Council
9. *Video* – Envisioning a water sensitive future for our cities and towns, Tony Wong, TedX, Canberra (20 min)
10. *Video* – Green infrastructure in the Gauteng City-Region
11. *Video* – cChanging course – a look into transformative river management
12. *Video* – Planting the rain to grow abundance, Brad Lancaster, TedX Tucson (20 min)

List of selected ESSENTIAL readings (full list available on the MOODLE platform)

1. Armitage, N., Fisher-Jeffes, L., Carden, K., Winter, K., Naidoo, V., Spiegel, A., Mauck, B. & Coulson, D., 2014. Water Sensitive Urban Design for South Africa: Framework and guidelines. WRC Report TT588/14. Executive summary as essential reading
2. Carden, K., Armitage, N., Fisher-Jeffes, L., Winter, K., Mauck, B., Sanya, T., Bhikha, P., Kanyerere, T. & Gxokwe, S. (2018). Challenges and opportunities for implementing Water Sensitive Design in South Africa. WRC Research Report No. 2412/1/18. Executive summary as essential reading
3. Sharma, A., Gardner, T., Begbie, D. (eds), 2019. Approaches to water sensitive urban design: potential, design, ecological health, urban greening, economics, policies, and community perceptions, Elsevier ScienceDirect Books, Amsterdam, Netherlands, EISBN 9780128128442.
4. Jacobsen, M., Webster, M. & Vairavamoorthy, K. *et al*., 2013. The future of water in African cities: Why waste water? The World Bank.
5. Armitage, N., Vice, M., Fisher-Jeffes, L., Winter, K., Spiegel, A. & Dunstan, J., 2013. The South African Guidelines for Sustainable Drainage Systems, WRC Report TT558/13. Executive summary as essential reading
6. Armitage, Neil, Michael Vice, Lloyd Fisher-Jeffes, Kevin Winter, Andrew Spiegel & Jessica Dunstan. *Sustainable Drainage Systems – Report and South African Case Studies.* Water Research Commission Report No. 1826/1/13. ISBN 978-1-4312-0424-3. Executive summary as essential reading
7. World Resources Institute (WRI), 2021. *Water Resilience in a Changing Urban Context: Africa's Challenge and Pathways for Action.* WRI, Washington, USA.
8. Harrison, P., Bobbins, K., Culwick, C., Humby, T-L., La Mantia, C., Todes, A. & Weakley, D., 2014. *Urban resilience thinking for municipalities*. Gauteng City-Region Observatory, University of Witwatersrand, Johannesburg, South Africa.
9. Fourie, W., Rohr, H., Cilliers, J. & Mostert, W., 2020. Guideline on compiling Water Sensitive Spatial Plans. WRC Report TT 809/2/20, Water Research Commission, Pretoria. Executive summary as essential reading
10. Fourie, W., Rohr, H., Cilliers, J. & Mostert, W., 2019. Framework towards Water Sensitive Spatial Planning and Land Use Management. WRC Report TT 809/1/20, Water Research Commission, Pretoria. Executive summary as essential reading
11. Carden, K., Fisher-Jeffes, L., Young, C., Barnes, J. & Winter, K. (2017). Guidelines for greywater use and management in South Africa. WRC Report No. TT 746/17. Executive summary as essential reading
12. Taing, L., Chang, C., Pan, S. & Armitage, N., 2019. Towards a water secure future: reflections on Cape Town's Day Zero crisis. Urban Water Journal, Vol 16(7), pp.530-536.
13. Hedden, S (2016) Parched Projects II, African Futures Paper 16, Institute of Security Studies.
14. WRI (2021). Water resilience in a changing urban context - Africa's challenges and pathways to action
15. GCRO (2014). Urban resilience thinking for Municipalities.

Part B: Virtual training sessions (Zoom)

The virtual sessions are to be conducted over three days, inclusive of group exercises. Group exercises will conclude with a short presentation by participants, 7-10 minutes per group. A short post-training assessment task will be presented to participants at the end of the virtual sessions (documentation of a short WSDP case study within the participant's home area - for completion within 2 weeks). At the end of the virtual training, the presentations and other reading material associated with the two days will be provided to participants. ***Certificates of attendance will only be provided once all assessments / assignments are submitted.***

WRC / CSE / UCT / JLL training programme on City-wide Water and Climate Resilience through Water Sensitive Design and Planning (WSDP) Virtual training, 2 to 4 February 2022			
Time	**Day 1 (2 February 2022)**	**Day 2 (3 February 2022)**	**Day 3 (4 February 2022)**
	Scale, data requirements and case studies	**Urban water resilience frameworks and case studies in South Africa**	**Planning and designing WSUDP features**
09h00 – 10h00	Feedback on Part A and introduction of participants (CSE, UCT)	Guest lecture 2 – 'Liveable urban waterways programme and other resilience initiatives', Ms Tamsin Faragher, Acting Director: Resilience, City of Cape Town	Planning considerations for RWH, SuDS, DWWT (CSE)
	Application of WSDP at regional scale – case studies highlighting the use of WSD and SuDS in South Africa (UCT)		O&M, Economics, Stakeholder involvement and institutional frameworks (CSE, UCT)
10h00 – 11h00	Data requirements for planning WSD features; sources of data (CSE)	Guest lecture 3 – 'C40 CFF Transformative riverine management programme', Mr Geoff Tooley, Senior Manager: Catchment Management, eThekwini Municipality	Opportunities for WSDP and building climate resilience in existing laws and policies in South African context (UCT, JLL)
Tea break			
11h30 – 13h00	Application of WSDP at Individual, Neighbourhood and Municipal scale: land-use and water quality & quantity impacts (UCT, CSE)	Group exercise on 'Data requirements and respective analysis for planning WSD features' (CSE, UCT)	Group exercise on 'Planning and Designing WSD features' (CSE, UCT, JLL)
Lunch break			
14h00 – 15h30	Guest lecture 1 - John Matthews (time tbc)		Group presentations
			Discussion and closing; post-training assessment (WRC, CSE, UCT, JLL)