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BOOK REVIEW

Resilient water services and systems: The foundation of well-being

by Petri Juuti, Harri Mattila, Riikka Rajala, Klaas Schwartz, Chad Staddon, (Eds.), 2019
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Resilience is replacing sustainability as the buzzword for developing better solutions to our current environmental issues. But resilience is a multifaceted concept which cannot be reduced to single dimensions as it is usually done in engineering or ecology. This book, edited and written by professionals of different backgrounds but with expertise on Water and Sanitation Systems (WSS), seeks precisely to offer a renewed and much more ambitious conceptualization of resilience able to confront the enormous challenges faced by WSS in the world today, especially the sheer injustice of billions of humans without safe and reliable water and sanitation. As professor Tapio Katko states in the preface, if the problem is not the resource or the technology but lies in faulty and unjust governance and institutions, then the concept of resilience needs to expand its horizons and move from the relatively well known and safe world of technology and management to the much more difficult and uncertain social and political arenas.

The book is structured in 15 chapters. Five chapters are conceptual and the remaining ten are case studies ranging from continents (Latin America and the Caribbean) to large and small countries (the United States and several, mostly Northern and Central European countries), to regions (the province of Zhejiang in central China) and to cities, including Tampere in Finland (compared to Carletonville in South Africa) Riga in Latvia, Tucson, in the arid North American South West, and Cape Town in South Africa. Examples from almost all geographical scales allow to develop a rich and variegated view of resilience that is not singular or uniform but multiple and heterogeneous striving to adapt to the very different contexts of WSS found in the world today.

In order to explore in full resilience as applied to WSS in all the case studies, the editors have taken the intelligent option of avoiding a too tight structure

allowing authors of the chapters to develop specific views of resilience implicitly under the key concept of historical path dependency. The overall framework is resilience as the editor's state clearly in the first chapter. However, the concept is never uniform and monolithic but diverse and malleable. The road map provided to authors emphasizes a few basic keywords, namely history, integration, management challenges, and futures. Above them, concept of path dependence or how past decisions influence specific notions of resilience (see for example Figure 2.1) acts as a common thread throughout the chapters. Path dependence is responsible for the dominant view in WSS of resilience as a technical and managerial problem. The picture emerging from most case studies, however, situates resilience in the realm of institutions and politics away from single expertise and requiring interactions between professionals and different stakeholders. Some of the empirical chapters include their own views of resilience so the reader is able to learn about the different meaning of the concept according to different political cultures, for example between the Scandinavian view, more centered on technical risk management (see for example the chapter on Sweden) and the Anglo-American view, more attentive to financial and operational issues (Chapter on the UK). Contrasting these different approaches is for me one of the great assets of the book since international comparisons always leave rich details for a comprehensive view on this subject.

The first two case studies include the USA and the Latin America and Caribbean Region with separate and yet converging challenges regarding resilience. In the first case the problem of mature systems reaching obsolescence is a cause of concern since aging WSS infrastructures are a major threat for the resilience of these systems. Perhaps a mention could have been made to the increasing and dramatic problem of water poverty in many American cities. Since no other sources of funding appear unavailable, the cost of

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infrastructure renovation will be passed on to consumers making inevitable rises in price with dire effects on vulnerable households. In his comprehensive view on WSS in Latin America and the Caribbean, Esteban Castro insists that the greatest challenges for resilient WSS in this region are socioeconomic, political and institutional, above all the tremendous inequities regarding access to safe and reliable water services. More importantly (p. 63), essential public services cannot be separated from the democratization of social and political life. On chapter 6, Heino et al take a definitive step towards the full incorporation of social sciences to resilience studies arguing that infrastructures are sociotechnical constructs and not simple physical artifacts. Resilience, they argue, has to do with individuals and organizations and their ability to engage in collaborative action (p. 70). Resilience must cross discipline boundaries and integrate many sources of knowledge which is fundamental to cope with unexpected, chaotic, and sometimes malevolent actions such as terrorist attacks.

The chapters on cities show a fascinating bundle of challenges for resilient WSS, from the most dramatic (Cape Town) to the innovative (Tucson) and to the unforeseen a few decades ago (Riga and Tampere). Undoubtedly, the Cape Town water crisis has become an example of WSS pushed to their limits. The chapter by Templehof tells vividly and with much detail how one the wealthiest and best managed African Cities went into a near collapse between 2015 and 2018 because of extreme water scarcity. In this case resilience (including the creation of a Resilience Committee by municipal authorities) was built at the same time than the crisis unfolded and lately emerged as an international benchmark for innovation in water management. However, as the quote by two key water managers on p. 141 reflects, it remains to be seen whether the crisis will have any effect on future episodes of water stress. At the other extreme, some cities such as Riga and Tampere must deal with oversized water infrastructure either because of population decline (Riga) or because of unmet projections of water consumption (Tampere). Here being resilient implies an entirely new challenge: whether experts and stakeholders are prepared to downsize capacities promoting a new generation of infrastructural works away from the common and firmly established philosophy of growing and expanding. Tucson's approach to resilience takes on the classical paradigm of risk reduction by diversifying sources of supply but including in the process a strong compromising in diversifying decision making as well and making citizens active in their water futures. This is not just a rosy path as negative tradeoffs appear in

many of the options explores to secure water for the city but it combines nicely a traditional version of resilience thinking in WSS, that of diversification of water portfolios, with public involvement in the process.

Finally, some case studies develop new and interesting concepts to build up resilience in WSS. For example, the concept of "One Water" (in the chapter devoted to the USA) which attempts to break down siloed flows (potable water, wastewater, stormwater, and reclaimed water). The separation of flows is another example of the relevance of the concept of path dependency in water approached historically. Likewise, the "Five Water Governance" of the Zhejiang province, one of the most problematic in China in terms of water pollution, envisages a hand in which wastewater treatment is the thumb and subject to the highest priority, and flood control, drainage, water supply and water conservation are the four fingers, different but highly integrated. The Dutch case study also proves that changes in resilience thinking and practice are also needed in what is probably one of the most robust WSS in the world. For Dutch water utility Vitens, resilience, a "magic concept" according to authors, starts by assuming that "things can go wrong and will go wrong". Hence the futility of being obsessed with zero risk. On the contrary, risks and potential failures become admissible and to a certain extent may be even welcome as long as performance levels are sustained. Vitens follows what is one fundamental shift in risk management; that is, going from "fail -safe to "safe to fail". This is not easily accepted and hence the controversies between the utility and its stakeholders but has been proposed as the main component of the Long-Term Vision (up to mid-21st century) of the company.

In the last chapter, lesson learned from the case studies are summarized and relevant points for a renewed approach to resilience in WSS exposed (p. 234). Words unfortunately still little heard in resilience debates such as multi-dimensional, multi-disciplinary, bottom up, local knowledge, and education appear as keywords for the renewed perspective on resilience developed in the book. One cannot avoid thinking of resilience as a version of the famous expression by Lampedusa "If we want things to stay as they are, things will have to change". This book, however, indeed sees resilience in a different light. Resilience of WSS is fundamental for human well being and, as the book argues through and through. The many experiences, strategies, proposals, compiled and presented in this book through the case studies will hopefully contribute to make WSS suited to human well being in many parts of the world.