Chapter 18
Design for Autonomy:
Water Resources in Ladakh

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ABSTRACT

This chapter describes one series of climate-adaptive design innovations found in Ladakh, north India. Five different water management techniques chart the region's unique and highly specialized response to water scarcity, and in so doing highlight important lessons for climate-adaptive planning elsewhere. In this case study, the dispersed, community-based water management strategies practiced in Ladakh suggest a level of design thinking that supports environmental stewardship, economic autonomy, cultural consciousness and social cohesion.

INTRODUCTION

In the face of global climate change, planners and designers can provide valuable expertise to communities in transition. Indeed, changing environmental conditions will necessitate new solutions for the mitigation and adaptation of infrastructural systems, human settlement patterns, and traditional ways of conceptualizing urban life. While the impacts of a changing climate are difficult to project and plan for, instability promises to become a common challenge of the Future City. In this environment, resilient, adaptive, and flexible designs for supporting human development suggest a way forward.

This chapter describes one series of climate-adaptive design innovations found in Ladakh, north India. Five different water management techniques chart the region's unique and highly specialized response to water scarcity, and in so doing highlight important lessons for climate-adaptive planning elsewhere. In this case study, the dispersed, community-based water management strategies practiced in Ladakh suggest a level of design thinking that supports environmental stewardship, economic autonomy, cultural consciousness and social cohesion.

While social capital rarely factors into the design of water infrastructure, it can have major policy and urban planning implications. This consideration is perhaps even more relevant in the tiny high-Himalayan villages of Ladakh, where the meltwater from glaciers and snowfields has always been treated as a

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form of the commons. In this region, subsistence agriculture practices demand a level of collaboration not often felt in more urban settings, as meltwater must be equitably divided amongst landholders, and farmers must work together to direct, store, and disperse this precious resource.

In this context, top-down government-generated planning decisions tend to be out of touch with the largely invisible social, cultural and religious processes that guide most of the decision-making and daily activities throughout the region. Unlike the high authoritarian planning schemes that have characterized other Indian cities, the water management practices described in this paper have instead been developed in and for Ladakh: they are knit into the Ladakhi cultural and social fabric, and are inextricably rooted to the region's environmental context (Scott, 1998). As a result, these design solutions are finely-tuned to the individualized needs of each community, deployed on a case-by-case basis. Whereas larger, government-sponsored infrastructural projects might lack a regional understanding of materials, construction techniques, environmental conditions or social frameworks, these design solutions reflect the context and culture that they serve.

LADAKH: CLIMATE AND CONTEXT

Located within the state of Jammu and Kashmir, in the rain shadow of north India's Himalayan range, Ladakh is a rugged and dry mountain region. Environmental conditions could be considered both extreme and inhospitable, characterized by high altitude, low humidity, and extremely low precipitation. The region is referred to as a cold desert environment, with temperature fluctuations that range from -40C to 35C and scarce rainfall, between 50 and 300mm annually (Bhasin, 1992; Demenge, 2007).

Ladakh's mountainous terrain is sparsely populated, containing some of the highest inhabited villages on earth (Norberg-Hodge, 2000). More than fifty villages exist in the region, supporting populations of 100 to 1,500 people (District Statistics & Evaluation Office, 2013). Moreover, the trans-Himalayan mountain range has effectively cut the region off from the southern portion of the subcontinent, where the "forbidding climate, remoteness and inaccessibility (has) kept Ladakh isolated, except for traders, for centuries" (Mann, 1986, 3).

In this challenging environment, strong social and cultural traditions have effectively tethered people to the land, and to each other. According to scholar R.S. Mann, Ladakhi "people feel that their adaptation (to climate) alone made them survive whenever nature posed threat (sic) to their existence" (Mann, 1986, vi). While humans have effectively and sustainably flourished in this region for more than one thousand years, existing environmental pressures, coupled with unstable weather patterns caused by a warming climate, have brought about changes to age-old patterns of living in recent years (Mingle, 2015; Rizvi, 1998).

Agriculture in Ladakh

While the region remains relatively isolated today, Ladakh has witnessed many sweeping changes over the last four decades, particularly with the rise of tourism and an increasing number of employment opportunities in the local military and government sectors. According to scholar Mohammed Deen Darokhan, this shift has also caused a deterioration in the practice of ancient farming techniques and agricultural reliance overall. Darokhan regards agriculture as "the only sustainable way of life in Ladakh," and worries that villages could "lose the genetic material and cultivation techniques due to a neglect of farming"