

Do Iranian Policy Makers Truly Understand And Dealing with the Risk of Climate Change Regarding Water Resource Management?

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ABSTRACT: Iran faces a serious and worsening water crisis, and water conservation by its farmers is rightly seen as crucial to any resolution. Since the hierarchically-bestowed large-scale dams and canals have delivered much less than was confidently expected, and since the individualistically-operated boreholes have resulted in the now widespread phenomenon of competitive deepening (groundwater depletion), these behavioural changes have turned out to be major contributors to Iran's looming water super-crisis.

Keywords: Water Crisis, Water Management, Government, Iran

1. INTRODUCTION

Water is a critical and scarce natural resource. However, due to rapid economic development, population growth, urban development, changing lifestyle, expanding agricultural irrigation, and climate change (Sauri, 2013), the demand for water is greater than that estimated using traditional water management systems in both developed (Hurlimann et al., 2009) and developing countries (Yazdanpanah et al., 2013c). There is evidence that by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity and that two-thirds of the world's population could be living under water stress (Verma et al., 2004). Lack of water is a constraint to the economic development of all countries in arid and semi-arid regions with poor water access, especially those heavily reliant on agriculture. Like many countries in the arid and semi-arid belt, Iran faces a growing water crisis (Faramarzi et al., 2009; Yazdanpanah et al., 2013a; Yazdanpanah et al., 2013b; Yazdanpanah et al., 2014). Although Iran has always had cycles of drought (Hayati et al., 2010; Yazdanpanah et al., 2013b), it is estimated that the per capita availability of water will be reduced by half by 2050 which will be, one might say, the "icing" on top of the catastrophic cake. The crisis is thus set to turn into a super-crisis due to climate change projects (Yazdanpanah et al., 2013a). For example, in November 2013, Iran's water and wastewater company (ABFA) declared that the water supply in Iranian cities is 56,000 L/s less than water demand, and that in 516 cities residents face water stress (Tabnak, 2013) or, Iranian farmers and others close to the land have watched water tables drop, as one well after another has dried up and formerly fertile lands have been forced out of the productive use (Yazdanpanah et al., 2016). While many researcher both in developed (Hurlimann et al., 2009) and developing countries (Yazdanpanah et al., 2015) have argued that traditional water management mainly relies on a supply-driven approach, which is no longer a reliable means of water management under current circumstances. However, many projects have been started by government to address these challenges, based on increasing supply (Yazdanpanah et al., 2016) which relies mainly on dam building or transfer of water from abundant area to scarce regions. This type of management is leading to a water management crisis worldwide (Hurlimann et al., 2009) and this, in turn, is causing many government authorities and policymakers to change their water management approach toward a demand-driven one (Beal et al., 2013) in order to reduce water deficits and ensure the availability of water for different sectors (agriculture, residential consumption, and commercial and industrial sectors). Demand management measures are generally the most sustainable solutions—environmentally, socially, and economically—in terms of the range of options they present for water supply security (White et al., 2007), and they can be utilized to help shift consumers toward sustainable water consumption behavior (Willis et al., 2011). The demand solutions include initiatives such as increasing the efficiency of appliances, using pricing and non-pricing options such as water restrictions, water-saving measures, and more importantly water conservation (Hurlimann et al., 2009).

In the field of water conservation behavior, there is a growing body of literature on both the economic drivers (price) and social psychological factors as determinants of household water consumption behavior. However, we believe that in Iran, due to the relatively low price of water compared to other essentials, household water demand is largely price inelastic. For example, the increasing water pricing policies implemented directly by the government (early 1990s then continued in the era of president Ahmadinejad through a targeted subsidies plan) were ineffective. Observers note that turning water conservation into practical action takes a long time among

Iranian water users. As MacFarquhar (2001) points out, the average water consumption in Tehran is 63 gallons per day, nearly double that of Western European nations. Moreover, in November 2013, Iran's water and wastewater company (ABFA) declared that demand for water was very high, and that rationing programs had to be carried out in cities and rural areas (Tabnak, 2013). Furthermore, if people only conserve resources for economic reasons, they will stop doing so once the behavior is no longer cost-effective or when it affects demand in the short term.

2. CONCLUSION

Given the realities of Iran's climate, the first option that needs to be considered is decreasing the demand for water, or water conservation (Yazdanpanah et al., 2016). However, although there is water scarcity in most areas of Iran and almost all parts and cities of Iran suffer from chronic severe water shortage in the face of rapidly rising demand, vital water conservation has not been a major concern of policymakers. Based on strong evidences we believed that Iranian government and policy makers still think technology and centralism methods can solve their problems. For example they think, transfer of water from Karoon River to the Esfahan and Kerman in centre desert of Iran can solve the water shortage in to these regions. However, we believed that this path will emerge new problems such as conflict between regions and different ethnic group which will threaten Iranian national security. For examples already there are some signs of conflicts between Government officials in these regions or people Protests. In other word we can see some sings of water war in Iran.

In sum, Iranian state is currently trying to do: an insufficiently clumsy (and largely hierarchical) approach - dams, long distance water transfers and so on - that does not allow for the constructive involvement of individualistic solutions or egalitarian ones. On top of that, the framing, in terms of climate change, encourages the thinking that if policies can be put in place that cope with climate change all will be fine. But that assumes that all was fine before climate change came onto the agenda, and of course it was not. There was already a looming water "super-crisis" in Iran, and climate change (if it is indeed having an effect) is therefore just the icing on top of the catastrophic cake.

3. REFERENCES

- Beal, C. D., Stewart, R. A., & Fielding, K. (2013). A novel mixed method smart metering approach to reconciling differences between perceived and actual residential end use water consumption. *Journal of Cleaner Production*, 60, 116-128.
- Faramarzi, M., Abbaspour, K. C., Schulin, R., & Yang, H. (2009). Modelling blue and green water resources availability in Iran. *Hydrological Processes*, 23, 486-501.
- Hayati, D., Yazdanpanah, M., & Karbalaee, F. (2010). Coping with drought. *Psychology & Developing Societies*, 22(2), 361-383.
- Hurlimann, A., Dolnicar, S., and Meye, P. (2009). "Understanding Behavior to Inform Water Supply Management in Developed Nations - A Review of Literature, Conceptual Model and Research Agenda." *Journal of Environmental Management*, 91(1), 47-56.
- MacFarquhar, N. (2001). Drought Chokes Off Iran's Water and its Economy. *New York Times*, 18.
- Tabnak. 2013. Threat of water rationing in the capital. 18th July, 332428.
- Sauri, D. (2013). Water conservation: Theory and evidence in urban areas of the developed world. *Annual Review of Environment and Resources*, 38, 227-248.
- White, S., Turner, A., Fane, S., & Giurco, D. (2007) Urban water supply-demand planning: a worked example. *4th IWA Specialist Conference on Efficient Use and Management of Urban Water Supply*. Jeju, Korea.
- Willis, R. M., Stewart, R. A., Panuwatwanich, K., Williams, P. R., & Hollingsworth, A. L. (2011). Quantifying the influence of environmental and water conservation attitudes on household end use water consumption. *Journal of Environmental Management*, 92(8), 1996-2009.
- Vermeir, I. & Verbeke, W. (2008). Sustainable food consumption among young adults in Belgium: Theory of planned behavior and the role of confidence and value. *Ecological Economics*, 64, 542-553.
- Yazdanpanah M, Monfared N, Hochrainer-Stigler S (2013b). Inter-related effects due to droughts for rural populations: A qualitative field study for farmers in Iran. *International Journal of Mass Emergencies and Disasters (IJMED)*, 31(2), 106-129.
- Yazdanpanah, M. Rahimi Feyzabad, F. Forouzani, M. Mohammadzadeh, S. Burton, R.J.F. (2015). Predicting farmers' water conservation goals and behaviour in Iran: A test of social cognitive theory.
- Yazdanpanah, M., Hayati, D., Zamani, G.H., & Hochrainer-Stigler, S. (2014) Understanding farmers' intention and behavior regarding water conservation in the Middle-East and North Africa: A case study in Iran, *Journal of Environmental Management* .
- Yazdanpanah, M., Hayati, D., Zamani, G.H., Karbalaee, F., & Hochrainer-Stigler, S. (2013a). Water management from tradition to second modernity: An analysis of the water crisis in Iran. *Environment, Development and Sustainability*, 1-17.
- Yazdanpanah, M., Thompson, M., Hayati, D., & Zamani, G.H. (2013). A new enemy at the gate: Tackling Iran's water super-crisis by way of a transition from government to governance. *Progress in Development Studies*, 13(3), 177-194.