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Policy and plural responsiveness: Taking constructive account of the ways in which Iranian farmers think about and behave in relation to water

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SUMMARY

Iran faces a serious and worsening water crisis, and water conservation by its farmers is rightly seen as crucial to any resolution. Whilst many farmers are profligate in their use of water, some are parsimonious: behavioural strategies vary and these strategies, we hypothesise, are accompanied by differing perceptions. These perceptions, we further hypothesise, are generated by the four different ways of organising – individualism, hierarchy, egalitarianism and fatalism – that are predicted by the theory of plural rationality. Informal guided interviews with 330 farmers in Boushehr Province support these hypotheses and show that both perceptions of and behaviour in relation to water are closely tied to the farmers' ways of organising which, in turn, are influenced by the socio-technological origin of their water: wells, irrigation canals, *qanats*. "Egalitarian" farmers are already behaving in the desired way; they are most prevalent among those who rely on wells. "Individualist" and "fatalist" farmers are profligate in their water use; they are most prevalent among those who rely on irrigation canals. The modern technology, we suggest, could be re-cast, in part, along the lines of the traditional *qanat* socio-technological system, so that water, at times and in places, is delivered as a common-pool good (egalitarianism) and not just in the current public good (hierarchy) or private good (individualism) modes.

1. Introduction

There has never been much water in Iran (mean annual precipitation is 250 mm) and there will likely be much less, per Iranian, in the years to come (Hayati et al., 2010; Yazdanpanah et al., 2014). Nor is it evenly distributed across time and space. Some parts of the country have much more rain than others, and that rain tends to come mostly between the months of October and March. Worse still, the amount of rain from that wet season, and its distribution, vary widely from year to year (Balali et al., 2009; Yazdanpanah et al., 2013b). Around 70% of the rainfall occurs in 25% of the country, mostly in the north and west (Aghaei, 2010; Chavoshian et al., 2005). Rising demand, due to population growth and the expansion of agriculture, compounded by the recent severe droughts, has led to chronic water shortages in many parts of the country (Yazdanpanah et al., 2014). Iranian farmers (and others who are close to the land) have watched water tables fall, wells dry up and formerly fertile lands (and even lands that could support only camels) being forced out of productive use (Balali et al., 2009; Yazdanpanah et al., 2013b).

With ecosystem services increasingly undermined by the loss of ecosystem functions, there is broad consensus that Iran faces a serious and worsening water crisis (Balali et al., 2009; FAO, 2006). On top of all this, climate change is predicted to increase the severity and frequency of extreme events (such as droughts) and to halve water availability by 2050. Climate change, while not itself the cause is, you could say, the icing on top of the catastrophic cake. The crisis is thus all set to turn into a super-crisis, with ever more land being taken out of production over the coming decades. Diminishing water reserves, unless something is done, will drastically erode both food security and rural incomes.

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Farmers, of course, have not been passive in relation to all these changes. While some have found themselves squeezed (sometimes to the extent that they have had no option but to abandon the land and migrate to the urban margins) into a fatalistic acceptance of a state of affairs over which they perceive themselves (rightly or wrongly) as having no control, others have responded in a variety of less passive ways. In particular, there has been a major shift away from the "traditional" socio-technical systems – typified by the *qanat* (*the chain-well* system of underground irrigation chan nels, for more details see Lightfoot, 1996) – and towards "modern" ones: large-scale dams and canals, for instance, and fossil-fuel powered extraction via boreholes (Yazdanpanah et al., 2013c).

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 (Yazdanpanah et al., 2013a,c). It is therefore clear that any attempt to intervene in the way things currently are, and to change behaviour through voluntary action, requires, first, an understanding of those current behaviours and, second, an understanding of how those behaviours can be changed. Acquiring these understandings is no simple task. Water is used for a multiplicity of purposes and across a wide range of geographical and social settings.

1.1. Purposes, Settings and People

In Iran, the agricultural sector is far-and-away the main consumer of freshwater (between 90% and 93%), followed by domestic usage for drinking, cooking, hygiene, etc. (between 5% and 6%) and then the industrial sector (at just one per cent) (Yazdanpanah et al., 2014) In consequence, farmers are the main target of all the policy efforts to conserve water and to enhance the efficiency of its use. Agricultural water, however, is cheap (in Iran water has a low price compared to other agriculture inputs and is often not seen as a cost by farmers) and its use is subsidised, with the result that many farmers have had no qualms about taking full advantage of what they see to be a plentiful supply. In doing this, they become both the victims and the cause of the ever-worsening shortfall in that supply (Esmaeili and Vazirzadeh, 2009). If this widespread profligate behaviour is to be curtailed, and replaced by much more parsimonious water use, then it will be necessary to gain some insight into the views about water of these irrigators. In fact, not all farmers are profligate in their water use, and Gill and Barr (2006) have argued that it is particularly important to determine the key characteristics of those who are already behaving in the desired way. In other words, the design of effective policy requires a discriminating approach: an approach that, rather than smearing farmers out across a behavioural and attitudinal spectrum, is sensitive to the discontinuities that separate the different groupings. Moreover, those who are profligate may not all be profligate in the same way, and the same may well hold for those who are parsimonious. An understanding of that plurality – a plurality that is missed by the "spectrum approach" – and of the factors that can lead to shifts from one of these clumps to another, constitutes the crucial knowledge base for the development of policy measures that will significantly increase water conservation among these key and disparate actors. This plurality (along with the factors that lead to its various transitions) is, we will argue, fairly consistent across time and space. Though our focus in this paper is on southern Iran, the findings, we believe, are applicable to other arid and semi-arid regions, particularly in MENA (Middle East/North Africa) countries with their broadly similar climatic, historical, cultural and religious backgrounds. Policymakers, if they are to come up with valid and applicable results, must make realistic assumptions about farmers. To assume that they are all incomparably different, for instance, would make policy impossible; in the other direction (and as we have already argued) assuming they are all the same would be to discard all the opportunities that stem from the fact that some farmers, despite all the present incentives for them to be profligate, are already behaving in the desired way.

Gill and Barr (2006) launched into their study by looking at the extent to which water conserving behaviours are linked to other "environmental actions", and then at whether different types of individuals (in terms of the nature of their social involvement) take part in them. Their tentative answer is that energy savers, water conservers and those who go in for recycling generally have a similar life-style: a lifestyle that differs quite markedly from those who do not behave in a conserving way and who also seem to share a distinctive lifestyle. Standard economic theory, as Siebenhuner (2000) has argued, is revealed as suffering from severe analytical and methodological shortcomings when confronted with this sort of grassroots heterogeneity. Much the same, but on a wider canvas, is argued in Mehta (2010): neoclassical economics – the kind of economics that is so much relied upon in policy work – is simply not up to the task. There is therefore a need to recognise behavioural complexity and to look for alternative approaches that are based on the idea of methodological pluralism (Gill and Barr, 2006). In the same spirit, Janssen and Jaeger (2000) point out that human behaviour, being inherently complex (in the mathematical sense of the word) cannot be captured by theories (and their associated methodologies) that set off by assuming it is simple (again in the mathematical sense of the word). Simple systems, for instance, are linear, deterministic, predictable and ergodic (small random events cancel themselves out in the aggregate); complex systems entail non-linearities, are indeterministic, unpredictable and "path-dependent" (small random events do not always cancel themselves out) (see Arthur, 1994).

2. An approach by way of the theory of plural rationality

One of the recurring objections to pluralism is that, once you have opened the door to it, there is no stopping it. If people are not all rational in the same way (in neoclassical economics it is the utility-maximising way) then, so the argument goes, we will end up with as many rationalities as there are people (and this is indeed what post-structuralism – sometimes called post-modernism or post-essentialism – asserts). On purely practical grounds, therefore, it makes sense to opt for an approach – it is called the theory of plural rationality – that posits more than one rationality but less than infinitude: four, in fact.

There are also arguments, of course, in terms of the conceptual superiority of this approach, together with an ever-proliferating literature of empirical studies in support of that claim (see, for instance, Verweij and Thompson, 2011). Many of these applications have been concerned with water and with various aspects of water management: the clean-up of the River Rhine and the Great Lakes (Verweij, 2000), for instance, flood risk in Hungary (Linnerooth-Bayer et al., 2011) demand management in Southern California (Lack et al., 2011), hydropower development in the Himalayan Region (Gyawali, 2011), and the current "lock-in" (in developed countries) to technologies that remove human waste from cities by putting it into and then removing it from the water cycle (Beck et al., 2011) to mention but a few. However, applications to water management in relation to agriculture have largely emanated from just two countries: the Netherlands and Nepal (e.g. Hoekstra, 2000; Offermans et al., 2011; Valkering et al., 2009; Middelkoop et al., 2004; Gyawali, 2001; Dixit, 2002; Moench et al., 1999).