**Thematic Week:** Water Economics and Financing

**Thematic Axis:** Water Markets

**Title:** Water Scarcity in the Middle East Need Not "Short-circuit" Regional Economic Well-Being

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**Abstract:**

**Keywords:**

In any future peace talks in our war-scarred region, the issue of the just allocation of water resources has and will become a topic of cardinal importance. The key word which always pops up is "shortage", namely, there is not enough water for all the inhabitants of the region, and the shortage will only worsen in coming years (whether due to demographic or the impact of climate change or both). Increasingly, we hear from water professionals and politicians that without a solution of this "shortage" problem, specifically by investing in supply increases, a very harsh future is foreseen for all inhabitants of the region. In addition to conventional projects, such as the recycling of waste water (which in any case needs to be brought to certain standards before pumping it back into any body of water), these projects are quite costly, and some substantially so, e.g., importing water or the desalination of sea or saline water. Thus, for example, several years ago the Israeli daily, Ha'aretz, quoted a working paper prepared by a team from Ben-Gurion University of the Negev that claimed, "…even today, the residents in Israel and the Palestinians are affected by the water shortage…it is up to the Israelis, the Palestinians and Jordanians to work out alternative means to supply their own water needs, or else they will soon face a hopeless situation." Indeed, the main recommendation of that study was to invest substantial sums of money to increase supplies by desalination of sea water. Incidentally, that report viewed with skepticism alternative projects, such as importing water from neighboring countries (e.g., Turkey), because of political and security reasons, even though that alternative may be cheaper than desalination processes.

Many economists would claim that these recommendations do not stand up to the test of economic reason and it would be appropriate to seriously examine other, less costly and less ambitious options, that are more feasible for Israel, Palestinian Authority, and Jordan alike.

The problem with desalination is that it may represent a typical form of an economic "short-circuit"; instead of focusing primarily on the efficient use of the *available* supply of water resources in the region, there is a tendency to leapfrog towards the supposedly easier "fix" of desalination, with the possible consequences of economy-wide resource misallocation. It can sometimes be likened to a case where two children fight over a piece of cake; if they were to share this piece of cake reasonably and fairly it would satiate both of them. Their mother, however, prefers to give them money so that they will be able to buy an additional piece of cake in order to enjoy peace and quite… until their next quarrel…

Once the problem has been diagnosed as a physical "shortage", then there is a natural tendency to portray it as merely a technical-engineering problem, with a ready technological fix, namely, desalination. The latter enables an immediately available solution to the "shortage", it does not require coordination among political entities, and financing can often be obtained from generous international donors who would view their act as a humanitarian gesture to the residents of the embattled region, who otherwise would be facing a catastrophe of water shortage. All that now remains to be settled is to select an efficient desalination facility, and to decide whether to desalinate sea or saline water, whether to use nuclear or conventional energy sources, etc. Of course, in the not so distant future it would be necessary to build yet more expensive facilities to supply the ever growing demands; the next "shortage" and catastrophe are just a matter of time.

This course of action, however, does not address the core of the problem, which is *economic* in nature. As long as water (or any other resource) whether in Israel, Jordan or the Palestinian autonomy, is seen as a free resource, un-priced or priced below its real cost (the total of production, delivery and scarcity cost components), imbalances between demand and supply will always occur, that is, a "shortage". Faulty pricing would always result in a "shortage", whether we deal with exclusive cars or any basic product like bread. Environmental resources typically are un-priced or inadequately priced, and this is why we suffer from excessive air pollution, disappearance of open spaces, or the accumulation of household and industrial wastes in landfills. In the case of water, the public at large is paying for this erroneous policy through higher taxes needed to subsidize the ever-increasing cost of supplying water from unconventional, expensive sources.

The popular forecasts concerning increased shortage often tend to emphasize the dangers loom for household needs (particularly the life-support services of drinking water, as well as other household uses, such as lawn irrigation and so on). These forecasts are indeed frightening. In retrospect, however, one notices that only in the years of severe drought, as in the early 90's, it would be absolutely necessary to ration water among urban consumers. However, instead of administrative cutbacks and rationing, a more efficient outcome would result if marginal water prices would have been raised (with appropriate compensation or waivers for low income households), resulting and the same "bottom-line" quantity outcome. At any rate, experience indicates that even during those dry years, there were no severe and dilapidating shortages for basic needs, although it was necessary to issue cutbacks for excessive uses, such as car washing and the watering of private gardens.

It is reasonable to assume that the "shortage" problem will not be really a problem for the urban sector, at least for the next decade or so. The claim that this presumed scarcity poses a "threat" and, therefore, justifies desalinating water at the price of over $(US)1/cm, the price that urban consumers in Israel anyhow pay for water priced at the margin. But Israeli urban water consumers are able today to purchase as much water as they want at this tariff, and to water all the lawn and cars, etc., they would wish to; in practice – they do not, and the reason is that these high marginal tariffs deter them from doing so. Therefore it is fundamentally possible to implement more cutbacks in water usage during a drought by raising water tariffs. What about agriculture? Well, farmers also reacted as expected during the above-mentioned drought: when water tariffs were significantly increased, surplus of water appeared! These observations necessarily lead one to conclude that desalination of water is not needed to solve the water problem for urban users. It would serve mainly to supply subsidized water to farmers!

It is important to emphasize that by no means should I be understood as supporting the withholding of water from agriculture. Steps need to be taken to implement a predictable policy of gradual increase in rates that will allow for suitable adaptation over a period of time to a new water regime, one which signals the growing scarcity of fresh water in a proper way, involving, among other, adopting different crops and types; further improving water usage, etc. On the plus side it should be noted that Israel is a world leader in the use of recycled water in agriculture` but there is scope for additional steps in this direction, given the impending scarcity and the expected impacts of climate change in our region. Furthermore, I would not preclude altogether the possibility of subsidizing water use in agriculture due to other considerations. Thus, given the increase in urban density and urban sprawl, it is important to recognize the functioning of agricultural land as open space with recreational and environmental benefits, for which society may wish to contribute through subsidizing agricultural land uses. This contribution may justify subsidizing resource uses (including water) in order to promote the tilling of agricultural lands, thereby preventing them from being converted to housing or industrial uses.

The discussion at this point harks back to issues involving water “shortage” which highlight past (and future) political negotiations among between Israel, Jordan and the Palestinian Authority. What is true for one country (e.g., Israel) definitely holds also for all the political entities in the region, and the relationships among them; the same economic principles are valid here too: first of all, existing water resources need to be shared and utilized in an efficient manner, with all parties cooperating so that overall regional benefits are optimized, before turning to expensive projects. The savings in outlays from adopting this principle should be significant, as was evident from studies carried out at both Tel Aviv and Haifa Universities (*cf*., e.g., Becker, N., Zeitouni. N. and Shechter, M., 1996. “Reallocating Water Resources in the Middle East through Market Mechanisms,” Ch. 13 in: Parker, D. D. and Tzur, Y. (eds.), 1996, Decentralization and Coordination of Water Resource Management, Amsterdam: Kluwer Academic Publishers.) One means for achieving this saving due to a more efficient utilization of existing water resources, is by

introducing *trade in water quotas*. As is well known form economic theory, trade benefits all parties involved. The above studies have shown that if there would be trade of water among the region's countries, thereby establishing a regional real price for the traded commodity (water quotas), some countries would find it in their own economic self interest to sell water (Israel, for example) to, say, the Palestinians. This is because the letter would be able to utilize this water in a more profitable way (i.e., the marginal value, or the "shadow price", of water, in the receiving country is higher).

It is important to note that the market price of the traded commodity – water, which will equate regional supplies and demands, implies no “shortage”, and from the above studies it is readily inferred that - for a period at least - it will be lower than the cost of desalinated water. For example, the above mentioned studies calculated that the equilibrium price of water under free trade will be in the neighborhood of 25-40 cents/cm, much lower than the cost of desalination (which at the time stood at 80-110 cent/cm). Furthermore, one should remember that after constructing a desalination plant, there is still a need to subsidize the expensive water in order that farmers say, in Gaza and the West Bank, will be able to actually utilize them. We may therefore conclude that before embarking on expensive projects such as desalination, decision makers should explore approaches which would serve to increase the supply of water, by the more efficient use of existing sources as well as cooperation (though trade) among the regions entities. True, it is possible to invest in increasing the physical supply of water though expensive projects, if there were no alternative use for that money; is that really the case in our region?

As a final note, I should emphasize that the arguments presented above should not imply that in due course the shadow price of water will not increase until it surpasses the (gradually decreasing) cost of desalinized water. Recent climatic trends, attributed with high probability to anthropogenic climate change, which may very well intensify over the coming century, may accelerate these developments, and necessitate expansion of fresh water production projects. Environmental degradation will also have an increasing claim on water for sustaining life-support ecological systems. Nevertheless, constructing expensive desalination plants today - before, say, exploiting all other, cheaper options (such as treating waste water, where Israel today is an acknowledged world leader), could prove to be a waste of scarce economic resources. It is safe to assume that these resources have alternative, maybe more important present uses in areas such as education, social welfare, or economic development, for all Middle Eastern countries.