WATER AND MIGRATION CRISES – ATMOSPHERIC WATER GENERATORS AND VORTEX ENGINES AS POTENTIAL SOLUTION

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Abstract:

The world is witnessing some of the largest refugee flows since the Second World War. Meanwhile, water crises are highlighted as one of the most pressing global challenges. In this context, migration and refugee flows are increasingly explained in terms of water scarcity – perpetuated by climate change. The main aim of this article is to show importance of water resources in nowadays human resource management. Applied research is needed on Atmospheric water generators, climate change adaptation technology like qanat systems, and atmospheric vortex engines. There is no clear conclusion to these topics until today while water crises is globally very important topic nowadays. Nowadays climate changes are partly consequence of the destruction of nature by the numans. Such destruction is linked to corruption and ignorance of decision makers.

Nikola Tesla wrote on 9 September 1915 (1915, p. 3):

But the time is very near when we shall have the precipitation of the moisture of the atmosphere under complete control, and then it will be possible to draw unlimited quantities of water from the oceans, develop any desired amount of energy, and completely transform the globe by irrigation and intensive farming. A greater achievement of man through the medium of electricity can hardly be imagined. The present limitations in the transmission of power to distance will be overcome in two way "through the adoption of underground conductors insulated by power, and through the introduction of the wireless art. The first plan I have advanced years ago. The underlying principle is to convey through tubular conductor hydrogen at a very low temperature, freeze the surrounding material and thus secure a perfect insulation by indirect use of electric energy. In this manner the power derived from falls can be transmitted to distances of hundreds of miles with the highest economy and at a small cost. This innovation is sure to greatly extend the fields of electrical application. As to the wireless method, we have now the means for economic transmission of energy in any desired amount and to distances only limited by the dimensions of this planet. In view of assertions of some misinformed experts to the effect that in the wireless system I have perfected the power of the transmitter is dissipated in all directions, I wish to be emphatic in my statement that such is not the case. The energy goes only to the place where it is needed and to no other.

Introduction

The contemporary European refugee crisis has demonstrated that Europeans are not that open towards accepting new out groups in their societies, at least not in the numbers proposed by the European Commission in autumn 2015. The plan, which was based on quotas for each EU member state, divided the Union into camps, shook its founding principle of unity in

diversity, and threatened the future of the European project as such (Murasovs, Ruza, Rascevskis & Dombrovskis, 2016).

At a time when we are witnessing some of the largest refugee flows since the second world war, and water crises are being highlighted by the World Economic Forum in their 2016 Global Risks Report as the most important concern for the coming decade, the importance of trying to understand the linkages between water and migration is widely accepted (Jägerskog & Swain, 2016).

Such interlink is very logic. People need water and food to survive. Agriculture is impossible without water. No water, no food and no agriculture mean migration. Nearly two billion people in the world lack access to clean water and more than two billion do not have adequate sanitation facilities (Jägerskog, Swain, 2016). There are often many reasons (including underlying push and pull factors), that cause people to flee or migrate. **Often, the underlying reasons for the migration and refugee flows – such as poor governance, and water and land management – are often overlooked when analyzing the key reasons behind migration. Rather, it seems easy to blame drought and climate change, as has increasingly been the case** (Jägerskog & Swain, 2016).

1. Moses as Skilled Migration – Human Resource Manager of Hebrews and Water Question

Moses was leading Hebrews to the Promised Land through wilderness for long forty years. Moses needed to ensure water for Hebrews. It is a question how he managed to do so. Moses is inspirative until today.

After the biblical exodus from Egypt, Moses made water for the people of Israel in the desert by striking a stone. Now Water-Gen is striking water from air. **Water-Gen, an Israeli company whose technology captures humidity in order to make drinking water out of air**, is not likely to experience the cash-flow squeeze that afflicts many fast-growing companies.

That's because Russian-Israeli entrepreneur and billionaire Michael Mirilashvili, who is also the vice president of the World Jewish Congress, bought control of the company last summer, and because it has high-profile advocates. Israeli Prime Minister Benjamin Netanyahu mentioned it in an interview with CBS's "60 Minutes" about Israel's high-tech prowess. At the AIPAC conference last month, Harvard Law professor and Israel advocate Alan Dershowitz took the stage to showcase its technology. In September, the company presented its solution at the United Nations (Solomon, 2017).

Nobodody knows what was real function of Moses Tabernacle which maybe housed the Ark of the Covenant. Logic idea would be that Tabernacle was also able to capture humidity in order to make water out of air. Such potential is indirectly supported by Nikola Tesla statement from September 9, 1915:

The records, though scanty, are of a nature to fill us with conviction that a few initiated, at least, had a deeper knowledge of amber-phenomena. To mention one, Moses was undoubtedly a practical and skillful electrician far in advance of his time. The Bible describes precisely and minutely arrangements constituting a machine in which electricity was generated by friction of air against silk curtains and stored in a box constructed like a condenser. It is very plausible

to assume that the sons of Aaron were killed by a high tension discharge and that the vestal fires of the Romans were electrical. The belt drive must have been known to engineers of that epoch and it is difficult to see how the abundant evolution of static electricity could have escaped their notice. Under favorable atmospheric conditions a belt may be transformed into a dynamic generator capable of producing many striking actions. I have lighted incandescent lamps, operated motors and performed numerous other equally interesting experiments with electricity drawn from belts and stored in tin cans (Tesla, 2015).

Between the Tabernacle and altar of burnt offering was bronze laver with water. Among other items altar of incense and oil lamps were inside tabernacle. Tabernacle had a **rectangular**, **perimeter fence** (of fabric, poles and staked cords. Gate to the fence was almost in one line with altar of burnt and bronze laver with water and entry to the Tabernacle. In such a way fence could play potential role in wind channeling towards Tabernacle and in such a way make air more hot across the altar of burnt with fire and humidified by bronze laver with water. Inside tabernacle was colder air that ambient air and could be reached dew point for water condensation.

Nowadays science can support such idea in many ways. For example amazing Reznikov conclusions: "The feasibility of evaluated concept for the electrostatic enhancement of water vapor harvesting from the air is experimentally proved. The five-fold improvement of the water collection rate with the improvised, non-optimized prototype is demonstrated" (Salazar, Minakata & Reznikov, 2015).

The experimental investigation of electrospray-supported condensation confirms a significant, 57%, improvement in condensation rate in steam condenser (Salazar, Minakata & Reznikov, 2015). Importace of abovemnioned topics is confirmed in a way that the Czech republic government approved participation in Expo 2020 in Dubai, where it will have its own pavilion and present a technology of water production from the air.

2. Nikola Tesla and his ideas about precipitation of the moisture of the atmosphere

Author of this article knows that attempts to get moisture from air by atmospheric water generators are poor in comparison with attempts to get moisture of the atmosphere in a way of heavy rains and in relations to hurricanes and such phenomena.

Let us get back to the Moses Tabernacle. Bible is saying following: EXODUS: 13:21–22

²¹ And ^sthe Lord went before them by day in a pillar of cloud to lead them along the way, and by night in a pillar of fire to give them light, that they might travel by day and by night. ²² The pillar of cloud by day and the pillar of fire by night did not depart from before the people (biblehub).

Moses probably knew how to control such clouds and fire and in the place where it was needed while it did not depart from before the people.

Let us talk about so called **dust devils**. They are comparable to tornadoes in that both are a weather phenomenon involving a vertically oriented rotating column of wind. Most tornadoes are associated with a larger parent circulation, the mesocyclone on the back of a supercell thunderstorm. Dust devils form as a swirling updraft under sunny conditions during

fair weather, rarely coming close to the intensity of a tornado (Glossary of Meteorology, 2000).

A **dust devil** is a strong, well-formed, and relatively long-lived whirlwind, ranging from small (half a meter wide and a few meters tall) to large (more than 10 meters wide and more than 1000 meters tall). The primary vertical motion is upward. Dust devils are usually harmless, but can on rare occasions grow large enough to pose a threat to both people and property (Glossary of Meteorology, 2000).

Dust devils form when hot air near the surface rises quickly through a small pocket of cooler, low-pressure air above it. If conditions are just right, the air may begin to rotate. As the air rapidly rises, the column of hot air is stretched vertically, thereby moving mass closer to the axis of rotation, which causes intensification of the spinning effect by conservation of angular momentum. The secondary flow in the dust devil causes other hot air to speed horizontally inward to the bottom of the newly forming vortex. As more hot air rushes in toward the developing vortex to replace the air that is rising, the spinning effect becomes further intensified and self-sustaining. A dust devil, fully formed, is a funnel-like chimney through which hot air moves, both upwards and in a circle. As the hot air rises, it cools, loses its buoyancy and eventually ceases to rise. As it rises, it displaces air which descends outside the core of the vortex. This cool air returning acts as a balance against the spinning hot-air outer wall and keeps the system stable (Ludlum, 1997).

Certain conditions increase the likelihood of dust devil formation.

- Flat barren terrain, desert or tarmac: Flat conditions increase the likelihood of the hot-air "fuel" being a near constant. Dusty or sandy conditions will cause particles to become caught up in the vortex, making the dust devil easily visible.
- Clear skies or lightly cloudy conditions: The surface needs to absorb significant amounts of solar energy to heat the air near the surface and create ideal dust devil conditions.
- Light or no wind and cool atmospheric temperature: The underlying factor for sustainability of a dust devil is the extreme difference in temperature between the near-surface air and the atmosphere. Windy conditions will destabilize the spinning effect (like a Tornado) of a dust devil (wikipedia, 2017).

Location of Moses Tabernacle was very promisable for such phenomena. Dust devil could be in principle related to the Pillar of Cloud mentioned in Exodus. Pillar of fire was also possible in similar way.

A fire whirl or swirl, sometimes called fire devils or fire tornadoes, can be seen during intense fires in combustible building structures or, more commonly, in forest or bush fires. A fire whirl is a vortex-shaped formation of burning gases being released from the combustible material. The genesis of the vortex is probably similar to that of a dust devil. As distinct from the dust devil, it is improbable that the height reached by the fire gas vortex is greater than the visible height of the vertical flames because of turbulence in the surrounding gases that inhibit creation of a stable boundary layer between the rotating/rising gases relative to the surrounding gases (wikipedia, 2017).

So, Exodus Pillar of Cloud and Pillar of Fire could be explained by Vortex phenomena and most probably could be created and controlled by Moses. Perhaps controlled in a way as Nikola Tesla claimed that Arch of Covenent was just a big layden jar and some static electricity charges (and whatever other potential phenomena) could be generated.

A dust devil picks up small dirt and dust particles. As the particles whirl around, they bump and scrape into each other and become electrically charged. **The whirling charged particles also create a magnetic field that fluctuates between 3 and 30 times each sekond** (Koch, 2005).

These electrical fields assist the vortices in lifting materials off the ground and into the atmosphere. Field experiments indicate that a dust devil can lift 1 gram of dust per second from each square metre (10 lb/s from each acre) of ground it passes over. A large dust devil measuring about 100 metres (330 ft) across at its base can lift about 15 metric tonnes (17 short tons) of dust into the air in 30 minutes. Giant dust storms that sweep across the world's deserts contribute 8% of the mineral dust in the atmosphere each year during the handful of storms that occur. In comparison, the significantly smaller dust devils that twist across the deserts during the summer lift about three times as much dust, thus having a greater combined impact on the dust content of the atmosphere. When this occurs, they are often called **sand pillars** (Kok, 2006).

3. Atmospheric Vortex Engine

The concept of a **vortex engine** or **atmospheric vortex engine** (**AVE**) was independently proposed by Norman Louat and Louis M. Michaud.

Michaud's patent claims that the main application is that the air flow through the louvers at the base will drive low-speed air turbines, generating twenty percent additional electric power from the heat normally wasted by conventional power plants. That is, the vortex engine's proposed main application is as a "bottoming cycle" for large power plants that need cooling towers (wikipedia, 2017).

The application proposed by Louat in his patent claims is to provide a less-expensive alternative to a physical solar updraft tower. In this application, the heat is provided by a large area of ground heated by the sun and covered by a transparent surface that traps hot air, in the manner of a greenhouse. A vortex is created by deflecting vanes set at an angle relative to the tangent of the outer radius of the solar collector. Louat estimated that the minimum diameter of the solar collector would need to be 44+ metres in order to collect "useful energy". A similar proposal is to eliminate the transparent cover. This scheme would drive the chimney-vortex with warm seawater or warm air from the ambient surface layer of the earth. In this application, the application strongly resembles a dust devil with an air-turbine in the center (wikipedia, 2017).

The genesis of Michaud's project, which began as a hobby in 1969, wasn't to produce energy at all: **He was aiming for water.** If you could heat air and then capture the condensation as it cools, he thought, it might offer an alternative to conventional distillation. That didn't pan out. But when Michaud read about how the atmosphere is warmed from the bottom and cooled from the top, he thought, "Oh! That's why we're producing energy in tornadoes."Creating a tornado sounds pretty easy, to hear Louis Michaud tell it. All you've got to do, he says, is "produce warm air, give it a spin, and basically have it rise." He has built machines that do

this—and of course, it wasn't quite so easy. With prototype after prototype of his Atmospheric Vortex Engine, the Ontario, Canada-based engineer set out to prove that humans could make their own twisters. He's done so on a small scale, creating narrow, wispy swirls easily dispersed by a strong wind. To power entire communities, though, it would take a much larger and stronger vortex—30 meters (98 feet) wide and 14 kilometers (8 miles) tall, Michaud says, adding that the force wouldn't be dangerous because it would be stationary and controlled. He envisions funneling waste heat from a power plant, for example, into his system; the spinning air would power a turbine as it naturally rises through the atmosphere (Nunez, 2015).

Conclusion

Potential of vortex engines is enourmous in a way of potential weather influence what is subject beyond the scope of this paper. However static electricity should be investigated in this way for potential fast atmospheric water harvesting based on mentioned Reznikovs' research. Also application of nanotechnology particles into such artifical votex could be considered to utilise potential piezoelectric effects and such. Atmospheric vortex engines and atmospheric water generators should be investigated more deeply. Perhaps can come into true Nikola Teslas' dream to have the precipitation of the moisture of the atmosphere under complete control, and then it will be possible to draw unlimited quantities of water from the oceans, develop any desired amount of energy, and completely transform the globe by irrigation and intensive farming. A greater achievement of man through the medium of electricity can hardly be imagined. In authors opinion it is sign of corruption or ignorance of the whole civilisation that such possibilities are not properly investigated or publicly known. Author of this paper does not have information that Moses Tabernacle and surrounding area were ever considered as potential atmospheric water generator and vortex engine despite such conclusion is logic and partly supported by texts in the Bible.

References

Glossary of Meteorology. American Meteorological Society. 2000. ISBN 978-1-878220-34-9.

Haaf, W., 1984. Solar Chimneys - Part II: Preliminary Test Results from the Manzanares Pilot Plant. *International Journal of Solar Energy* 2(2), 141–161.

Haaf, W., Friedrich, K., Mayr, G., and Schlaich, J., 1983. Solar Chimneys. Part 1: Principle and Construction of the Pilot Plant in Manzanares. *International Journal of Solar Energy* 2(1), 3–20.

Hartley, L.K. & Pedersen, A. (2015). Asylum Seekers and Resettled Refugees in Australia: Predicting Social Policy Attitude from Prejudice versus Emotion. *Journal of Social and Political Psychology*, 3(1), 179–197. http://dx.doi.org/10.5964/jspp.v3i1.476

Jägerskog, Swain et. al. 2016. Water, migration and how they are interlinked. Working paper 27. SIWI, Stockholm.

Kamans, E., Otten, S. & Gordijn, E.H. (2011). Power and threat in intergroup conflict: How emotional and behavioral responses depend on amount and content of threat. *Group Processes & Intergroup Relations*, 14(3),293–310. http://dx.doi.org/10.1177/1368430210372525

Koch, J., Renno, N. (2005). Convective-radiative feedback mechanisms by dusty convective plumes and vortices" *Fall meeting of the American Geophysical Union* (Dec 5–9, 2005).

Kok, J., Renno, N. (2006). Enhancement of the emission of mineral dust aerosols by electric forces. *Geophysical Research Letters*. 33 (Aug. 28)

Ludlum, M. (1997). *National Audubon Society Field Guide to North American Weather*. Knopf. ISBN 978-0-679-40851-2.

Michaud, L. M. (1975). Proposal for the use of a controlled tornado-like vortex to capture the mechanical energy produced in the atmosphere from solar energy. *Bulletin of the American Meteorological Society* 56, 530-534.

Michaud, L. M. (1977). On the energy and control of atmospheric vortices. *Journal de Recherches Atmospheriques* 11(2), 99-120.

Michaud, L. M. (1995). Heat to work conversion during upward heat convection. Part I: Carnot engine method. *Atmospheric Research* 39, 157-178.

Michaud, L. M. (1996). Heat to work conversion during upward heat convection. Part II: Internally generated entropy method. *Atmospheric Research* 41, 93-108.

Michaud, L. M. (1999). Vortex process for capturing mechanical energy during upward heatconvection in the atmosphere. *Applied Energy* 62, 241-251.

Murašovs, V., Ruža, A., Raščevskis, V., Dombrovskis, V. (2016). Expecting Refugees in Latvia: Negative Stereotyping. *Economics and Business*, 29, 56-64

Nunez, Ch. (2015). Can We Really Make Tornadoes for Energy? This Man Wants to Try.*National Geographic* (December 4, 2015).

Reznikov, M. (2003) Dielectrophoretic Dehumidification of Gas Stream in Low and Moderate Electrical Fields, Proc. ESA-*IEEE Joint Meeting of Electrostatics*, Little Rock, AR, June 24 27, 2003, pp. 230-240.

Reznikov, M. (2015). Electrically Enhanced Condensation I: Effects of Corona Discharge. *IEEE Trans. Industry Applications*, vol. 51, no. 2, 2015, pp. 1137-1145.

Salazar, M., Minakata, K., Reznikov, M (2015'). Electrically Enhanced Condensation II: Effects of the Electrospray. *IEEE Trans. Industry Applications*, vol. 51, no. 2, 2015, pp. 1146-1152.

Shoshanna, S. (2017). Extracting water from air, Israeli firm looks to quench global thirst. *The Times of Izrael*, April 16, 2017. https://www.timesofisrael.com/extracting-water-from-air-israeli-firm-looks-to-quench-global-thirst/

Schlaich, J., Bergermann, R., Schiel, W., and Weinrebe, G., 2005. Design of commercial solar tower systems—utilization of solar induced convective flows for power generation, *Journal of Solar Energy Engineering* 127, 117-124.

Tesla, N. (1915). The wonder world to be created by electricity. *Manufacturer's Record*, September 9, 1915

United Nations High Commissioner for Refugees (UNHCR, 2015a). UNHCR Global Trends –Forced Displacement in 2014. Retrieved February 2016, from http://unhcr.org/556725e69.htm

United Nations High Commissioner for Refugees (UNHCR, 2015b). *Integration of refugees in Latvia: Participation and Empowerment*. Retrieved May 2016, from http://www.emn.lv/wp-content/uploads/ UNHCR_Integration-of-refugees-in-Latvia.pd

http://biblehub.com/exodus/13-21.htm https://en.wikipedia.org/wiki/Dust_devil https://en.wikipedia.org/wiki/Vortex_engine