**Telescoping into the US to analyze dynamic multi-sector hotspots and inter-sectoral linkages.**

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**Abstract**

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* Google Sheet: <https://docs.google.com/spreadsheets/d/1HxYzOf6g8Y_wH81eNUUbniznkPPFiEqX9247wKY-hso/edit#gid=1426711730>
* Github Page: <https://github.com/zarrarkhan/paperMetisUSA>

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# Introduction

## Literature Review:

**Dynamic Hotspot Analysis**

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| --- | --- | --- | --- | --- |
| **Study** | **Definition** | **Theme** | **Positives** | **Negatives** |
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**Hotspot Analysis Literature Review (Will go into SI)**

Ed Byers 2018 (Byers et al., 2018)

**Global exposure and vulnerability to multi-sector development and climate change hotspots**

<https://iopscience.iop.org/article/10.1088/1748-9326/aabf45/meta>

Byers et al. 2018 (Byers et al., 2018) develop a multi-sector risk indicator which is a combination of normalized scores (from 0 to 3) assigned to 14 different indicators across the water (6 indicators), energy (4 indicators) and land sectors (4 indicators). The indicators are chosen to represent a broad range of threats across the EWL systems. The combined multi-sector threat index which ranges from 0 to 9, is the sum of the mean value within each sector. In order to avoid high and low values canceling each other out during the averaging, additional conditions ensure that if certain indicators within a sector cross pre-established minimum thresholds the combined sectoral score is assigned a minimum value. The multi-sector risk factor for each grid is then combined with projections for different population and income distributions to analyze the exposed and vulnerable populations. The index is calculated at 0.5 deg resolution for 2010 and 2050, for 3 different Global Mean Temperature changes (1.5, 2 and 3 deg C) above pre-industrial levels (1881-1910) for SSP1, SSP2 and SSP3. The GMT scenarios are picked from a series of different runs using various GCMs run for different RCP scenarios to reach the different GMT’s in 30 year time-slices. Historical baseline is 1971-2000 (0.6 deg C above pre-industrial levels). GCMs were chosen for which the target GMT was reached by 2085.

RAND 2016 (Willis et al., 2016)

**Developing the Pardee RAND Food-Energy-Water Security Index: Toward a Global Standardized, Quantitative, and Transparent Resource Assessment**

<https://www.prgs.edu/pardee-initiative/food-energy-water/about.html>

<https://www.rand.org/pubs/tools/TL165.html>

El-Gafy 2017 (El-Gafy, 2017)

**Water–food–energy nexus index: analysis of water–energy–food nexus of crop’s production system applying the indicators approach**

<https://link.springer.com/article/10.1007/s13201-017-0551-3>

Karan & Asadi 2018 (Karan and Asadi, 2018)

**Quantitative modeling of interconnections associated with sustainable food, energy and water (FEW) systems**

<https://www.sciencedirect.com/science/article/pii/S0959652618322649>

Venghaus & Dieken 2019 (Venghaus and Dieken, 2019)

**From a few security indices to the FEW Security Index: Consistency in global food, energy and water security assessment**

<https://www.sciencedirect.com/science/article/pii/S2352550919301587>

Miner & Rodgers 2019 (Miner and Rodgers, 2019)

**Parts Unmapped: Linear Multi-variate Analysis of Food, Water, and Temperature Requirements for Regional Stability**

<https://apps.dtic.mil/dtic/tr/fulltext/u2/1081507.pdf>

Zhang et al. 2019 (Zhang et al., 2019)

**Understanding the tele-coupling mechanism of urban food-energy-water nexus: Critical sources, nodes, and supply chains**

<https://www.sciencedirect.com/science/article/pii/S0959652619321973>

Tashtoush et al. 2019 (Tashtoush et al., 2019)

**A review of the water–energy–food nexus measurement and management approach**

<https://link.springer.com/article/10.1007/s42108-019-00042-8>

Mc Grane et al. 2018 (McGrane et al., 2019)

**Scaling the nexus: Towards integrated frameworks for analysing water, energy and food**

<https://rgs-ibg.onlinelibrary.wiley.com/doi/abs/10.1111/geoj.12256@10.1111/(ISSN)1475-4959.Geography_and_the_Water-Energy-Food_Nexus>

Endo et al. 2017 (Endo et al., 2017)

**A review of the current state of research on the water, energy, and food nexus**

<https://www.mdpi.com/2073-4441/7/10/5806/htm>

Endo et al. 2015 (Endo et al., 2015)

**Methods of the Water-Energy-Food Nexus**

<https://www.mdpi.com/2073-4441/7/10/5806/htm>

**Multi-Scale (Inter-links)**

Veldhuis (2017)

**Integrated approaches to the optimisation of regional and local food–energy–water systems**

<https://www.sciencedirect.com/science/article/pii/S2211339817300242>

Abulibdeh & Zaidan 2020 (Abulibdeh and Zaidan, 2020)

Uses WEF index from RAND 2018.

Cremades et al. (2019) (Cremades et al., 2019)

Vinca et al.

NEST

Brown et al. 2019 (Brown et al., 2019)

**Adaptation to Future Water Shortages in the United States Caused by Population Growth and Climate Change**

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018EF001091>

(Abulibdeh and Zaidan, 2020; Albrecht et al., 2018; Bazilian et al., 2011; Cremades et al., 2019; de Strasser et al., 2016; Endo et al., 2017; Gober, 2018; Ibrahim et al., 2019; Johnson et al., 2019; Kahil et al., 2017; Kurian and Ardakanian, 2015; Lechón et al., 2018; Liu et al., 2018; Nauditt, 2018; Newell et al., 2019; Nhamo et al., 2018; Oki et al., 2017; Opejin et al., 2020; Rasul and Sharma, 2016; Ringler et al., 2013; Saladini et al., 2018; Sarkodie and Owusu, 2020; Scott et al., 2015a, 2015b; Simpson and Jewitt, 2019; Sušnik et al., 2018; Vinca et al., 2019; Wallington and Cai, 2017; White et al., 2018; Zhang et al., 2018; Zhu, 2020)

## Research Questions:

# Methodology

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# Results & Discussion

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# Conclusions

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# Acknowledgments

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# Data availability statement

All data that support the findings of this study are included as part of the supplementary information.

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