Final Project

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1 Introduction

The goal of this paper is to analyze the 2018 Environmental Performance Index by the Yale Center for Environmental Law and Policy to determine varying factors that influence sustainability. The Environmental Performance Index is used to calculate the levels of sustainability for each country based on its results in ecosystem vitality and environmental health. Previous research shows various factors such as average income and location can theoretically contribute to supporting a country is to its environmental issues.

1.1 EPI

The EPI is the Environmental Performance Index that is calculated from each country and is taken from their overall scores of environmental health and ecosystem vitality.

1.2 Factors

Each factor has previous research done that shows the possibility of it influencing how sustainable a country can be.
Average Income
Education Scoreshttps://www.geographic.org/country$_r anks/educational_s core_p erformance_c ountry_r anks_2$009
$PopulationSize$
$Possiblymore$?

2 Methods

Each factor will be categorized to intermediate levels of intensity. For income, countries are divided by High Income (¿12,235), Upper Middle (3,956-12,235), Lower Middle Income (1,006-3,955), and Low Income (¡1,005). Location is divided into 6 categories: Africa, Americas, Asia, Europe/European Union, Middle East, and Oceania. After, both factors are compared to the EPI in order to distinguish their relationships to sustainability using k-means clustering.

Because each factor is categorical, however, clusters will be determined from comparing EPI and either ecosystem vitality or environmental health, with location/income being displayed with varying colors.
6 k-means cluster plots will be analyzed:
EPI and Ecosystem Vitality (location)
EPI and Ecosystem Vitality (income)
EPI and Environmental Health (location)
EPI and Environmental Health (income)
Ecosystem Vitality and Environmental Health (location)
Ecosystem Vitality and Environmental Health (income)

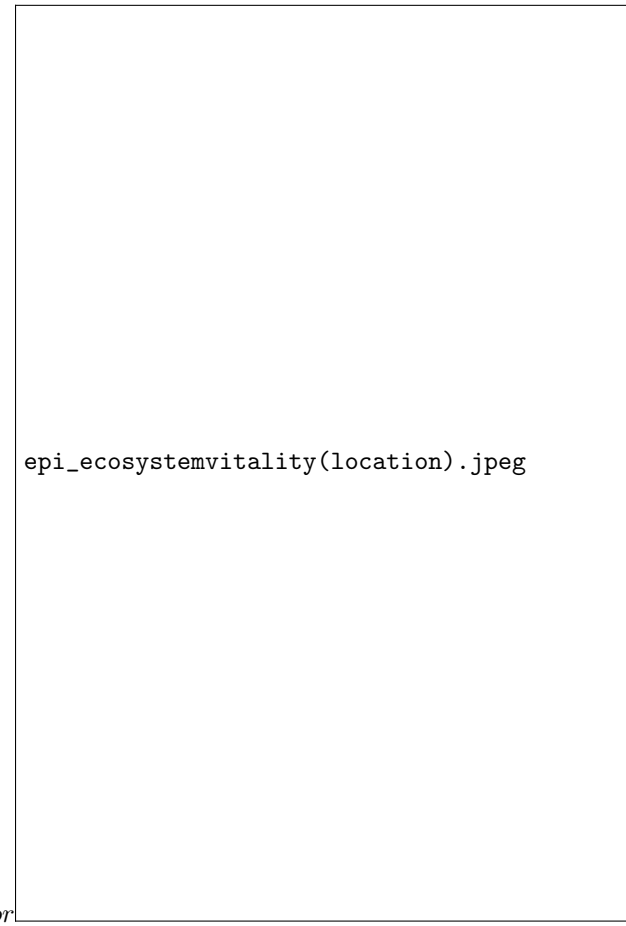
3 Results

Table 1a: EPI and Environmental Health with Location factor Scatter plot

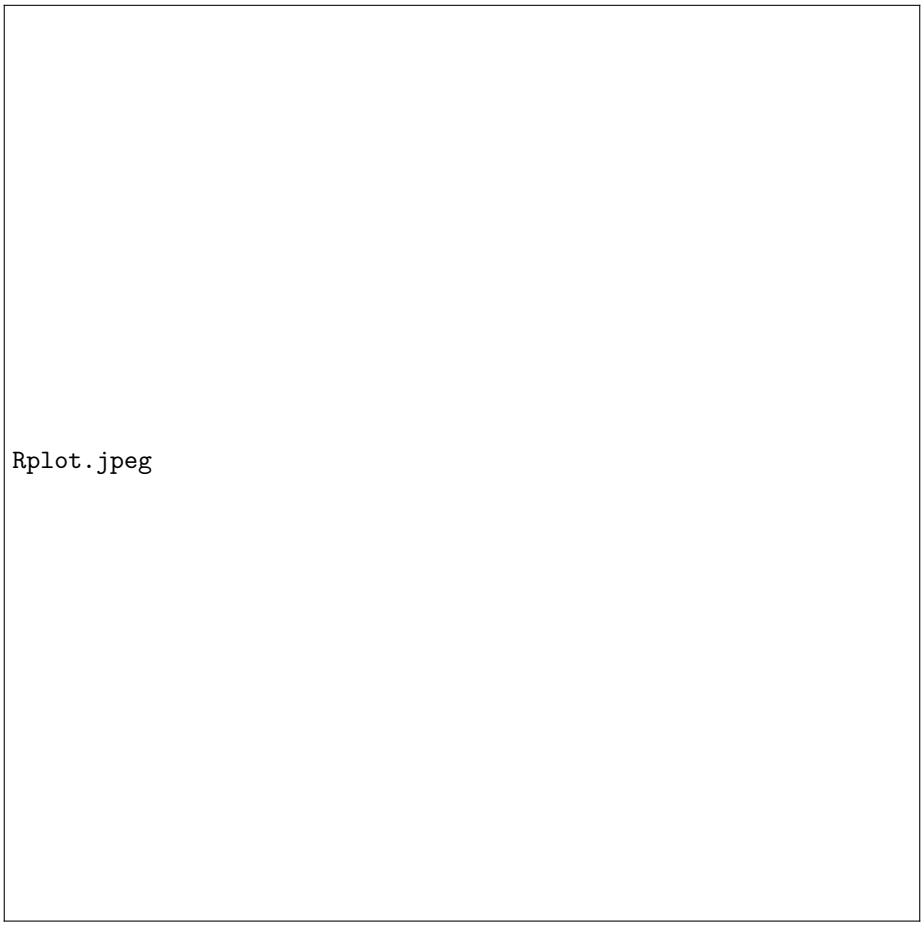
code: ggplot(data, aes(x=epi, y=envirohealth, color=location)) + geom$_p oint(shape =$

1)
$Table2a : EPIandEnvironmentalHealthwithIncomefactor$

$code : ggplot(data, aes(x = epi, y = envirohealth, color = incomebracket)) + geom_point(shape = 1)$

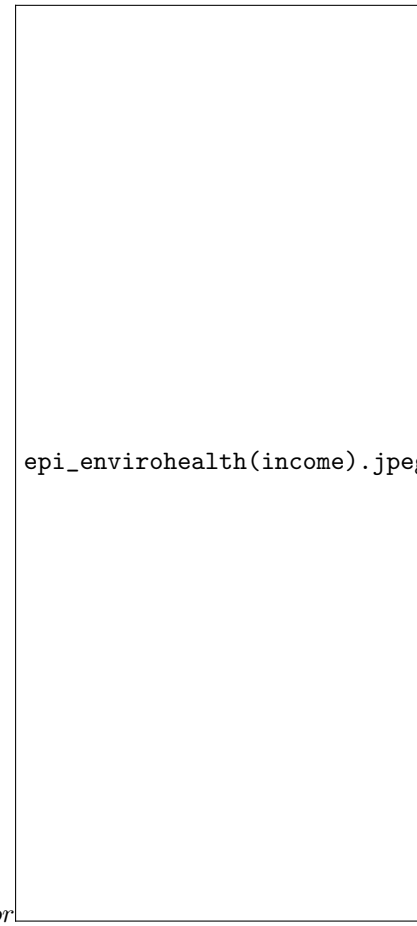


$Table 3a : EPI and Ecosystem Vitality with location factor$
$code : ggplot(data, aes(x = epi, y = ecosystemviability, color = location)) + geom_point(shape = 1)$
$Table 4a : EPI and Ecosystem Vitality with Income factor$



$code : ggplot(data, aes(x = epi, y = ecosystemviability, color = income)) + geom_point(shape = 1)$
$Table5a : EcosystemVitalityandEnvironmentalHealthwithLocationfactor$

$code: ggplot(data, aes(x = envirohealth, y = ecosystemviability, color = location)) + geom_point(shape = 1)$



$Table 6a : Ecosystem Vitality and Environmental Health with Income factor$
$code : ggplot(data, aes(x = envirohealth, y = ecosystemviability, color = income)) +$
$geom_point(shape = 1)$

4 Discussion