Proposal for rebalancing food distribution in Jakarta informed by the analyzing the trends of food insecurity and availability between the period before and after Covid-19

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The achievement of Sustainable Development Goal (SDG UN 2015)[2] – ''End hunger, achieve food security" will be measured as a long-term goal. Food wastage is a stark indication of the inefficiency of current food systems distribution, we can improve food distribution in the Jakarta neighborhood by analyzing data of poverty number, population with medium or severe food insecurity and food sources from potential donator extracting from Jakarta Open Data Source and Central Bureau of Statistics of Indonesia. Then, we visually explore the trends of food needs and food sources in both period of before and after Covid-19 to represent varying geography of potentially food distribution improvement. This model allows us to see the rate change of food insecurity and availability in the year of Covid-19 is far more than the year before Covid-19 and also to figure out whether the number of food availability is far more than the number of hunger people or vice versa.

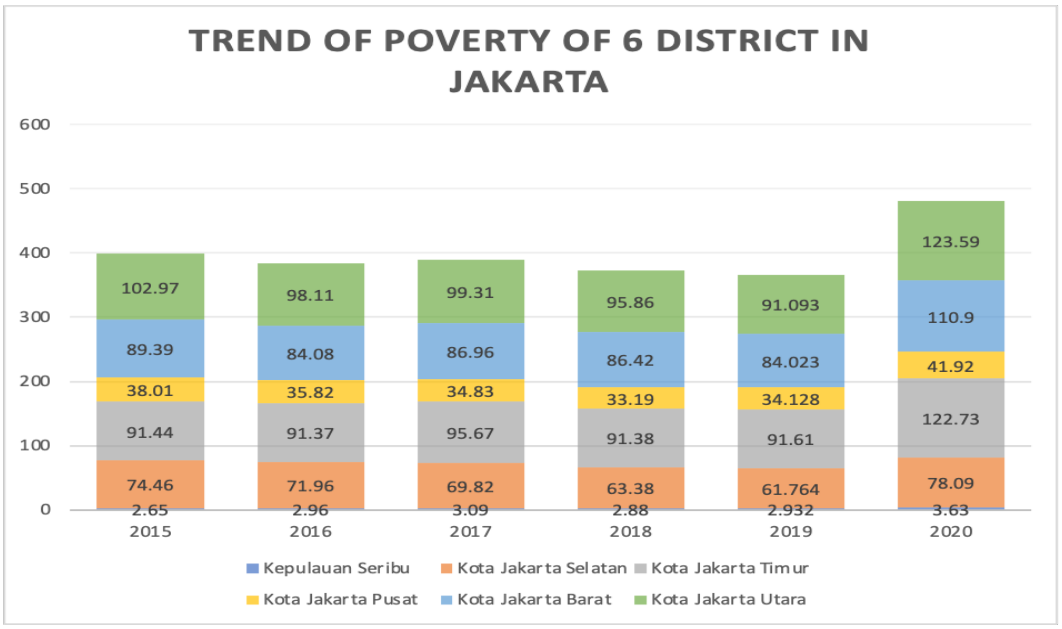
1 The current program to address food insecurity do not optimize expected reduction level of hunger

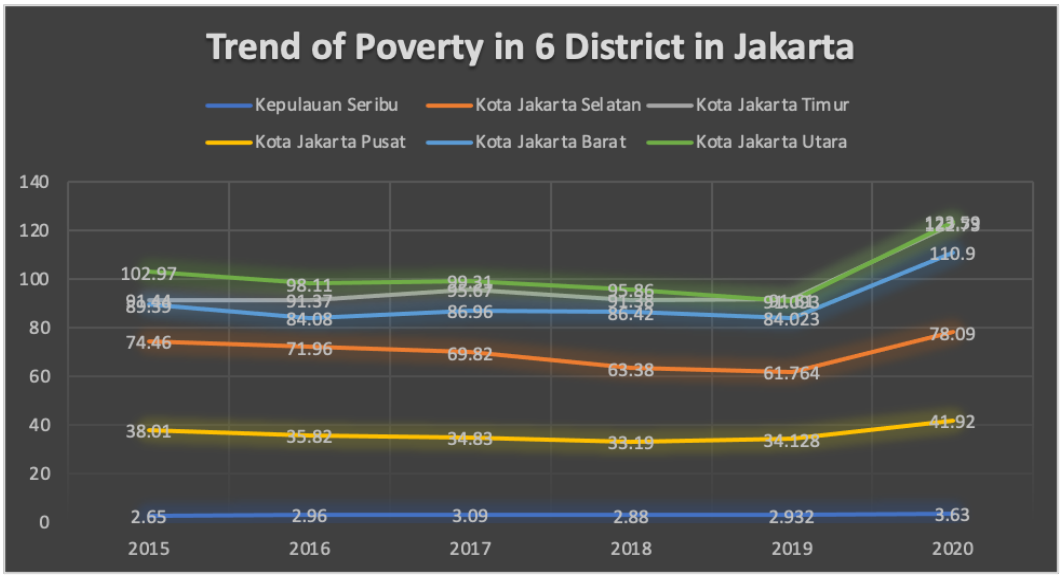
The effort of UN program to achieve food security by ensuring sustainable food production systems would address this problem in the long run. While in that case, food insecurity and food wastage are two things that happen in Jakarta ironically. Recalling the previous, public study by World Food Programme's (WFP), it conducts real-time food security monitoring to track the latest food security trends the hunger level in 93 countries including Indonesia using HungerMap[LIVE]. As those visualizations did not combine dimensions of specific location, number of hunger people and food availability of which the public would find helpful to see food insecurity trends by neighborhood, we can begin our analysis there. We need to optimize the food distribution using analytics displayed on an interactive platform. It's time to find the intersection of trends in both food availability and food insecurity.

2 Modeling trends for food distribution optimalization represents a more extensive advantage

To see the potential of implementing trend models, let's compare the global hunger monitoring system (HungerMap). The most important requirement is to advance the integration and analysis of data such as neighborhood association ID, number of starving poor people and number of food sources from local restaurants, bakery, hotel, caterer, supermarket etc. in a real-time for specific area. More specifically, how can we know the expectation that food availability reduced the number of the hunger people and by how much?

Using **trend analysis approach**, I will code a generative model that along with food insecurity outcomes considers various information. In addition, we can use **OpenStreetMap Indonesia**[14] to create interactive map for food and hunger trend analysis. Given 2015 to 2020 data, this model suggests the rebalancing of food distribution.


TREND OF POVERTY OF 6 DISTRICT IN JAKARTA
600
500
400
300
200
100
0
102.97
98.11
99.31
95.86
91.093
123.59
89.39
84.08
86.96
86.42
84.023
110.9
38.01
35.82
34.83
33.19
34.128
41.92
91.44
91.37
95.67
91.38
91.61
122.73
74.46
71.96
69.82
63.38
61.764
78.09
2.65
2.96
3.09
2.88
2.932
3.63
2015
2016
2017
2018
2019
2020
Kepulauan Seribu
Kota Jakarta Selatan
Kota Jakarta Timur
Kota Jakarta Pusat
Kota Jakarta Barat
Kota Jakarta Utara


Trend of Poverty in 6 District in Jakarta
Kepulauan Seribu
Kota Jakarta Selatan
Kota Jakarta Timur
Kota Jakarta Pusat
Kota Jakarta Barat
Kota Jakarta Utara
140
120
100
80
60
40
20
0
102.97
98.11
95.86
110.9
84.08
86.96
86.42
84.023
74.46
71.96
69.82
63.38
61.764
78.09
38.01
35.82
34.83
33.19
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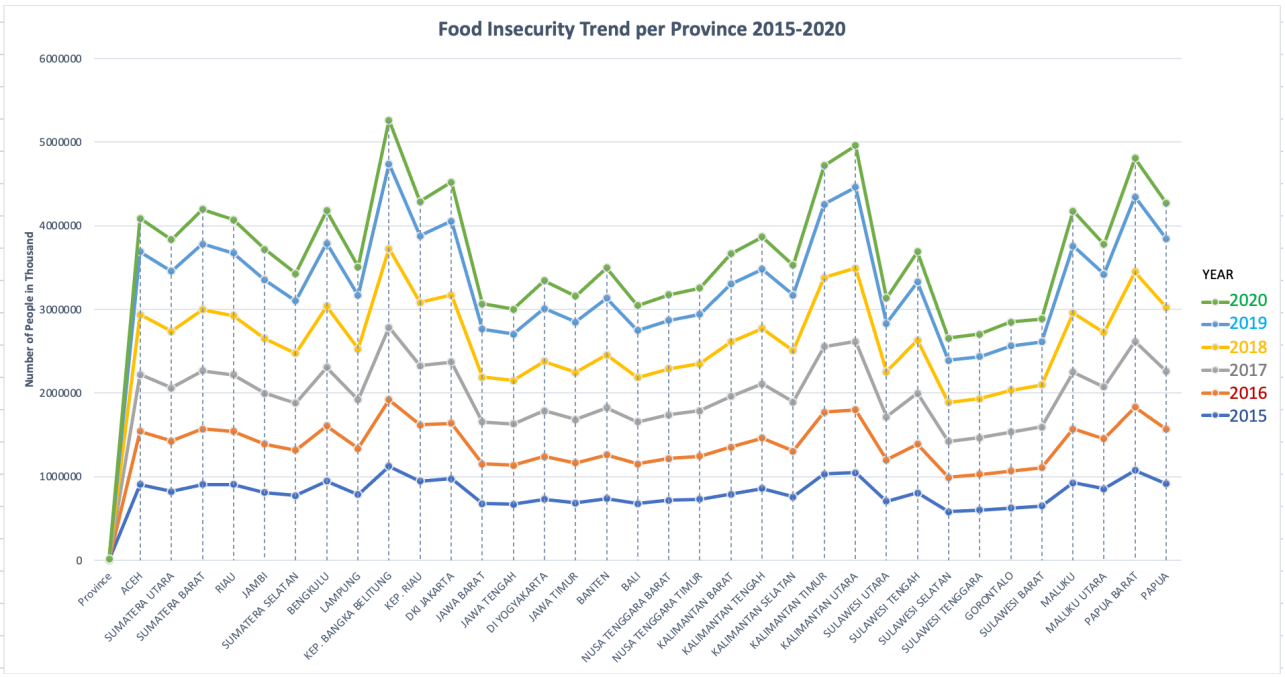
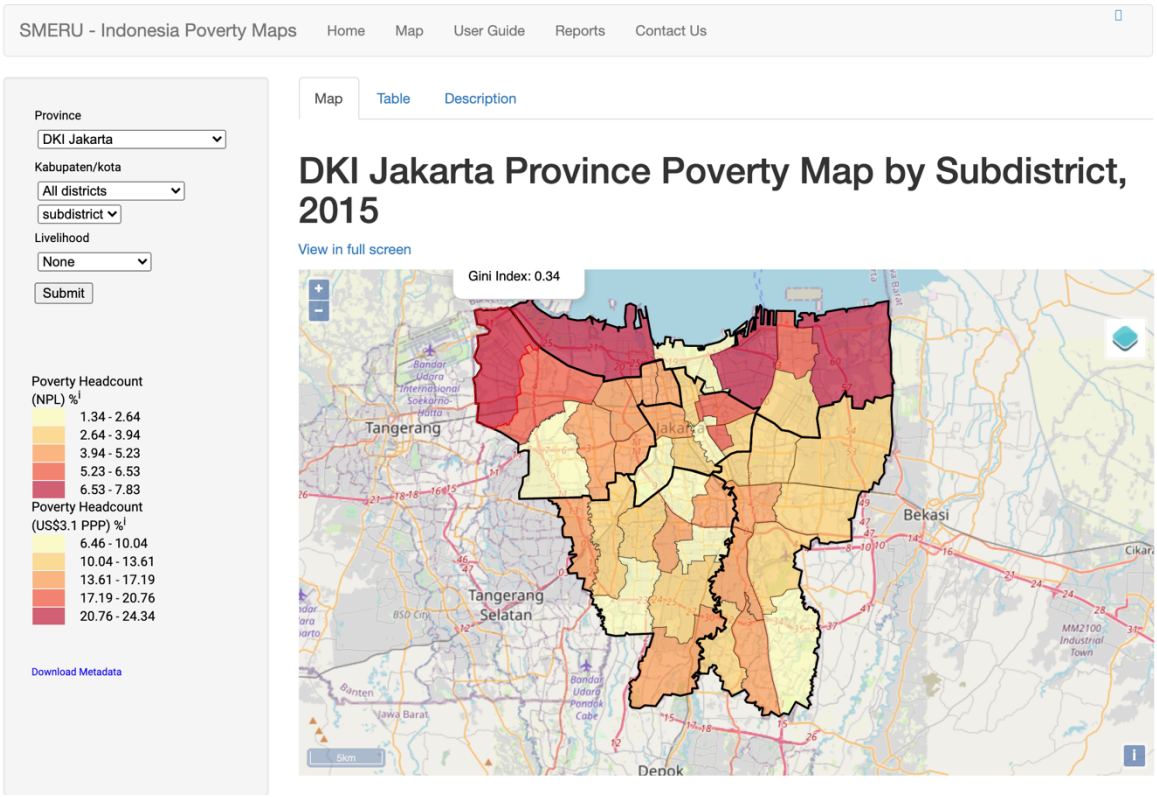


Graphic Mapping (this map is just as a reference):



3 For value, compare an investment to long-term goals of sustainable food production systems, and the agricultural productivity

We should compare cost to an investment of sustainable food production system and agriculture productivity. These efforts are more costly and in long-term period, while using this model to monitor food needs and food availability in specific area would be a real and quick solution to reduce hunger level as it connecting the dot.

4 For sustainability and accuracy, compare model results to World Food Program Hunger Maps

To assess the performance of this model, we can compare the accuracy of our model against the Hunger Map. This analytic would coverage specific area with more detail and accurate data and provide food source data in order to support decision making in more effective distribution. Regarding system sustainability, we can develop a mobile application for the public (this is beyond the scope of this project) as a community monitoring and reporting system of hunger people, and list of food donator which have leftovers sharing or whoever who wants to share food.

3 Cost analysis and Constraint

The costs involved in conducting this project refer to CoolData[13] :

No	Resource	Cost description
	Infrastructure and Software	The infrastructure of data storage, servers, network and monitoring tools. Additional required tools are an ETL (Extraction, Transform and Load) or Tableau, real-time database and visualization tools. Using 3TB per month as an example, the cost more than $134,000, infrastructure and software amount close to $180,000.
	Developers	Required human resources who real know-how and involves numerous specialists, engineers who are experienced with Big Data, which is a rather scarce resource nowadays, and an expensive one at that. A partial list of the experts the system requires: ETL developers, cloud infra experts, R/Python developers, database administrators (DBAs), data analysts, dashboard developers and so forth.
All in all, for example a system for 3TB per month requires about eight data engineers at a cost of roughly $800,000. An acquired solution cuts these costs down substantially.		

The project will last for three months with following schedule:

No	ACTIVITY	February				March				April			
		WEEK……											
		1	2	3	4	1	2	3	4	1	2	3	4
1	Planning												
2	Learning process												
3	Evaluation												
4	Data collection												
5	Data analysis												
6	Interactive design of infographic												
7	Reporting Results (Interactive application)												

The other constraint of this project includes lack of time to develop mobile application aforementioned above, so it will be the next recommendation to complete this project.

5 Conclusion

Using trend analytics to visualize the geographic of food availability vs food insecurity would be a feasible approach for this project to overcome problematic hunger society. In other words, we can connect connect all parties for a food security solution. Let's discuss how to build this integrated model along with cost effectiveness and worth our spend.

6 References

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