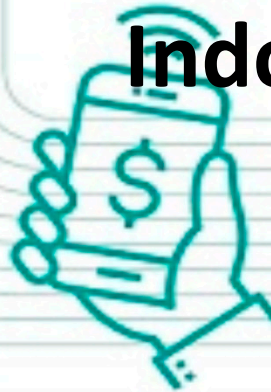# Indonesia Sustainable Welfare Index (ISWI)

Measuring Sustainable Economic Welfare in The Digital Era

Rendra Achyunda Anugrah Putra
BPS-Statistics Indonesia

Silvia Arini
BPS-Statistics Indonesia

Nov 19-20, 2018 | Washington, D.C. | IMF Headquarters

Outline

A. A. Indonesia' experience on Measuring Economic Welfare

B. Extending the Current Index

C. Establishing Indonesia Sustainable Welfare Index (ISWI)

D. Conclusion

STATISTICS INDONESIA

1. Introduction

Indonesia has established an index of economic welfare, known as :

Indeks Kesejahteraan Rakyat (IKraR)

which has been adapted to the cultural, social, and economic condition in Indonesia.

2. IKraR

What

- IKraR is used to assess the level of people's welfare in Indonesia.

- Measuring tools used to assess the success of inclusive development.

- Measuring the availability of access to the fulfillment of basic rights of the people.

When

It has been developed since 2012

STATISTICS INDONESIA

2. IKraR

Why

- IKraR seeks to find out whether access to achieve the development goals is adequately available and whether the access has been utilized by the citizens.

- Accommodates indicators and targets included within the achievement of the Millennium Development Goals (MDGs).

2. IKraR

Who

Ministry of Social Welfare Indonesia collaborate with Statistics Indonesia

How

Three dimensions monitored by 22 indicators which have been selected after a long and throughout test and discussion by experts, government institutions, independent institutions, and related community.

1) social dimension
2) economic dimension
3) dimension of democracy and governance

2. IKraR Indicators

Social Dimension	Economic dimension	Dimension of Democracy and Governance
✓Electricity Access ✓Access to Health Facilities ✓Recreation ✓School Duration ✓Social Security Utilization ✓Life expectancy ✓Clean Water Access ✓Access to Sanitation ✓Expenditure per capita ✓Income Equity Level	✓Home Ownership ✓Work ✓The ratio of Expenditure to poverty ✓The ratio of Own Source Revenue to Gross Regional Domestic Bruto ✓Access to Resources ✓Economy ✓Education Cost Ratio ✓The ratio of Health Cost to total expenditure	✓Information Access ✓Sense of security ✓Civil Liberties ✓Political Rights ✓Democratic Institution

1. Motivation

- The objectives of Sustainable Development Goals (SDGs)

- Digitalization offers new and innovative "big data" sources to capture welfare gains

2. <u>Objectives</u>

- This study establishes the Indonesia Sustainable Welfare Index (ISWI) that is research proposal.

- Account for SDG
  - to assess economic welfare in Indonesia in the digital era in addition to fulfill the objectives of SDGs.

- Explore big data
  - Combine statistical data from NSO and explores the Big Data from Google Trends in order to accommodate the effect of digital era

STATISTICS INDONESIA

3. Data Sources

- **BPS (Statistics Indonesia)**

  Statistical activities conducted by BPS, such as Socio-Economic Survey, Village Potential, Forestry Survey, Consumer Tendency Survey, Information Technology Survey, Indonesian Democracy Index (IDI) and other relevant statistical activities.

- **Other ministries**

  Administrative data from other ministries, some of which involve the Ministry of Environment and Forestry and also the Ministry of Social Welfare in Indonesia.

- **Google Trends data**

  Data from Google Trends based on keywords searched in Bahasa Indonesia since 2012.

  Keywords obtain consumer expectation: includes several popular brands of household durables such as transportation, housing, recreation, and communication.

1. Methodology

1. Collecting Data (NSO, Ministries and Big Data)

2. Transforming Data

3. Selecting Indicators by Theoretical Study and Statistics

4. Evaluating Result

5. Calculating ISWI

STATISTICS INDONESIA

2. ISWI's Dimensions

1. **The Social Dimension**
2. **The economic dimension**
3. **The Dimension of Democracy and Governance**

IKraR Dimensions

4. **Environment**
5. **Digital**
6. **Expectation**

Expanding Dimensions

3. Expanding Dimension

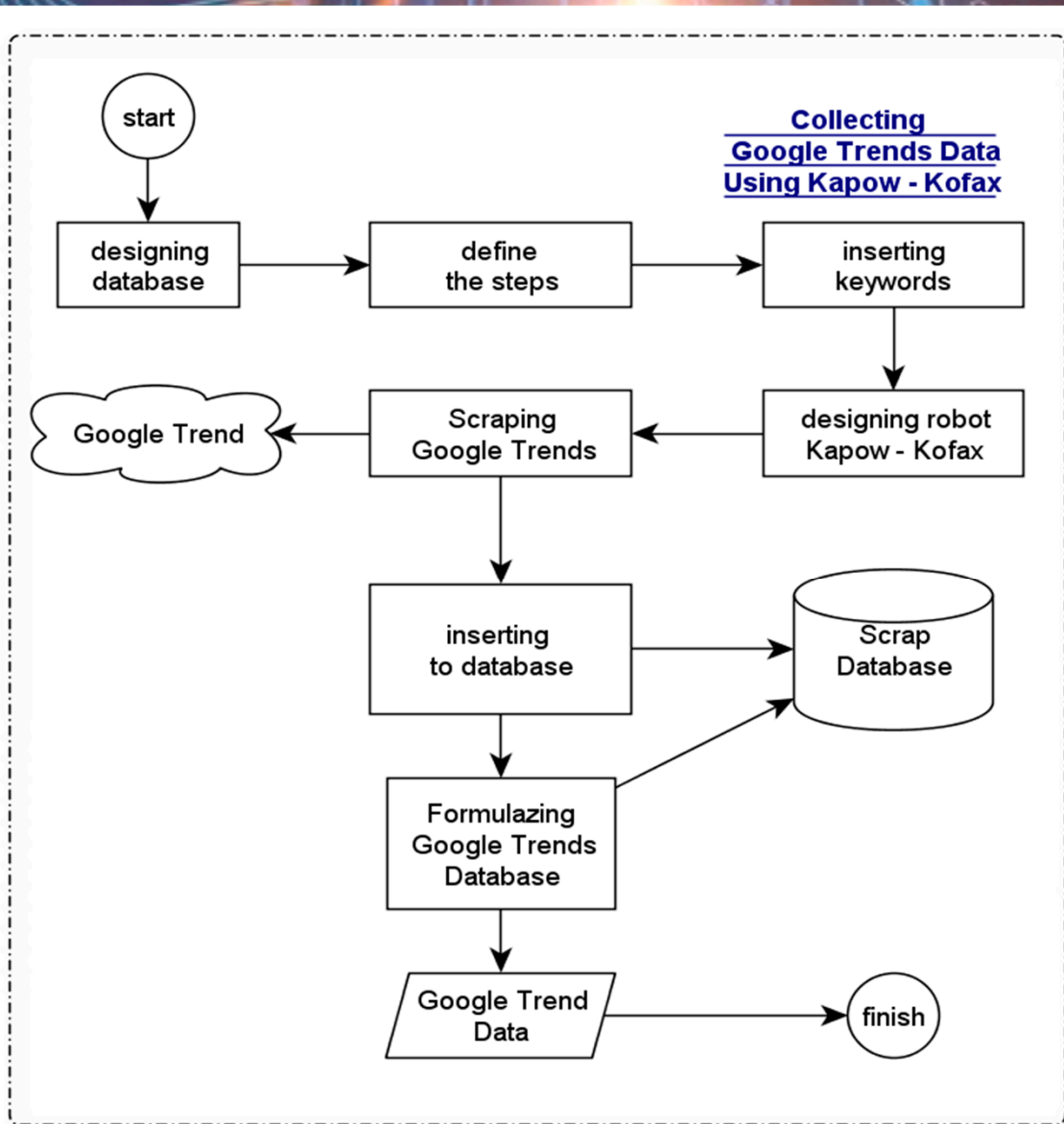| Environmental	Digital	Expectation
• Air Quality Index • Land Cover Index • Water Quality Index	• Percentage of Population Owning Cell Phones • Percentage of Population Owning Computers • Percentage of Population Owning Cable Phones	• Consumer tendency index • Adjusted per capita expenditure (Purchasing Power) • **Google Trend Data** : Transportation, Recreation, Digital, Household appliances, Investment

4. Web-scraping Google Trends Data

google_trends

Year
Province
Keyword
Content
ObjectKey
RobotName
ExecutionId
FirstExtracted
LastExtracted
ExtractedInLastRun
LasUpdated

Design of Google Trends Database

Collecting
Google Trends Data
Using Kapow - Kofax

start → designing database → define the steps → inserting keywords → designing robot Kapow - Kofax → Scraping Google Trends → Google Trend

inserting to database → Scrap Database

Formulazing Google Trends Database

Google Trend Data → finish

5. Data Transformation Formula

The formula to transform the indicators index is as follows:

$$I_j = \frac{v_j - v_{min}}{v_{max} - v_{min}} * 100$$

- I_j $= indicator's\ index - j$
- v_j $= value\ of\ indicators - j$
- v_{min} $= minimum\ value\ of\ indicators - j$
- v_{max} $= maximum\ value\ of\ indicators - j$

STATISTICS INDONESIA

6. ISWI Formula

- Calculating the weight of each indicator's index for each dimension by Factor Analysis

- Calculating the proportion of index values on each indicator.

- Calculating the dimension index by multiplying the original value by its indicator weight.

- The ISWI is calculated by counting up the average value of those dimension indexes.

6. ISWI Formula

$$\text{ISWI} = \sum_{d=1}^{6} W_d \sum_{i=1}^{i=j} F_{di} I_{di}$$

- I_i $\quad = \ indicator's\ dimension - d, index - i$
- F_{di} $\quad = Weight\ of\ dimension - d, indicators - j$
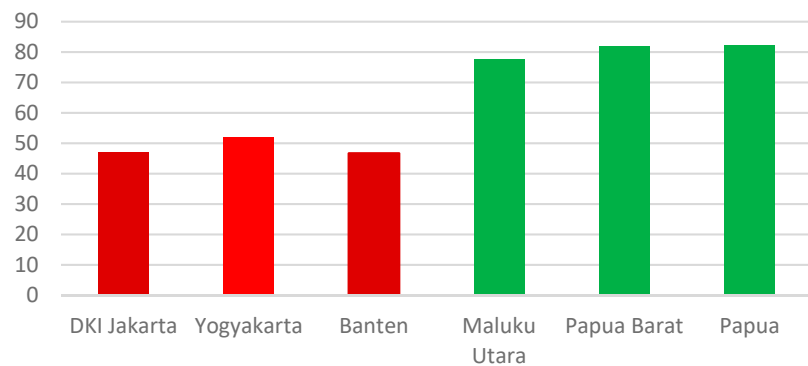- W_d $\quad = weight\ dimension - d$
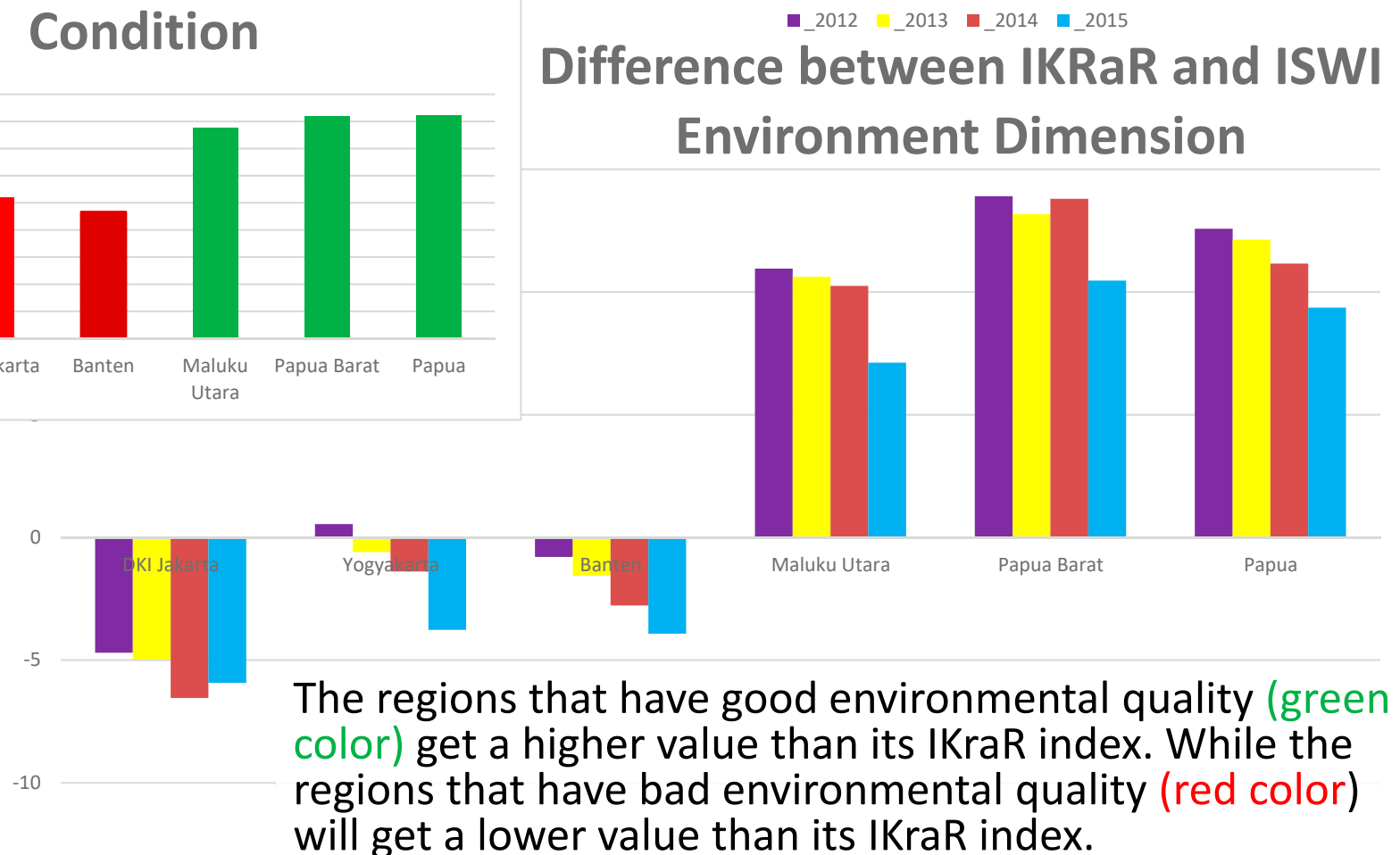
1. Main Findings

- The improvement of current welfare is not followed by the increase of environmental quality.

- The changes caused by digitalization have positive effects on welfare through greater access to information.

- Higher consumption expectations also determines an increase in welfare.

Environmental dimension
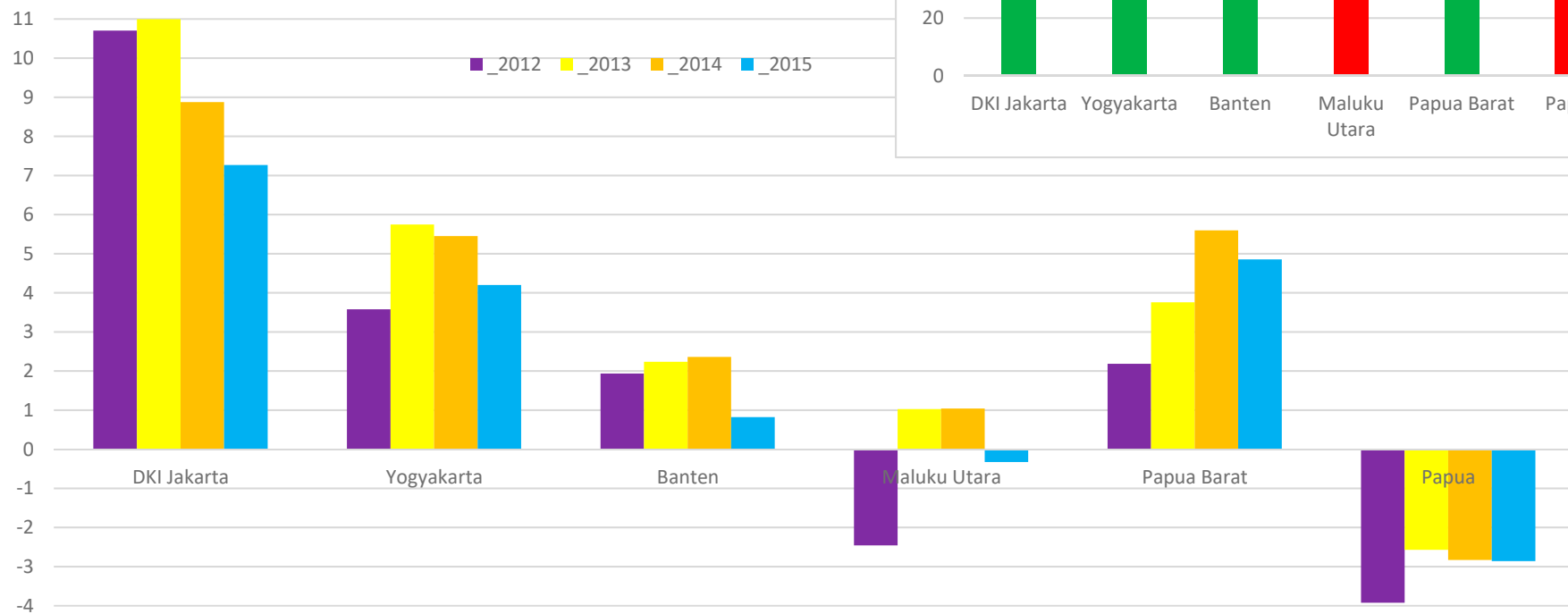
Average Environment Condition

Difference between IKRaR and ISWI Environment Dimension

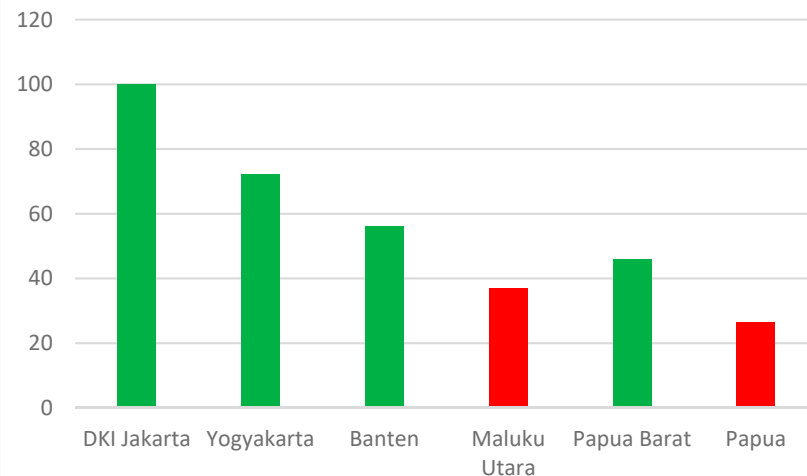Legend: ■ _2012 ■ _2013 ■ _2014 ■ _2015

The regions that have good environmental quality (green color) get a higher value than its IKraR index. While the regions that have bad environmental quality (red color) will get a lower value than its IKraR index.

Digital Dimension

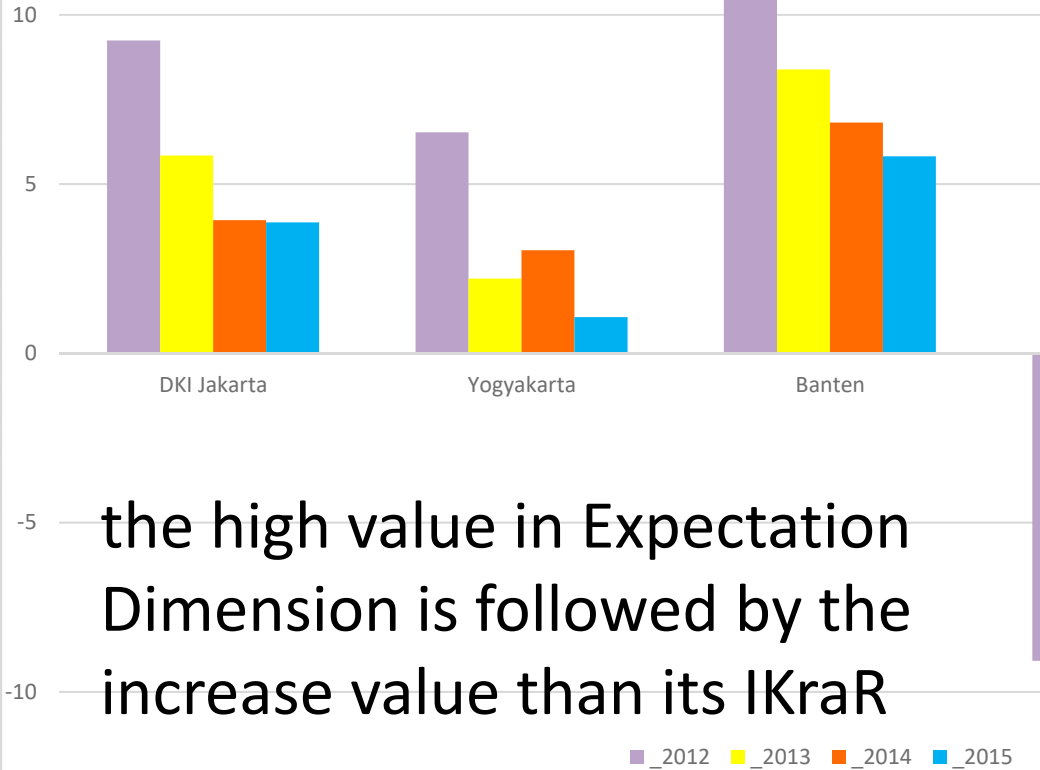## Difference between IKrar and ISWI Digital Dimension

Average Digital Value

The provided index shows that the province with more digital technologies has the higher value.
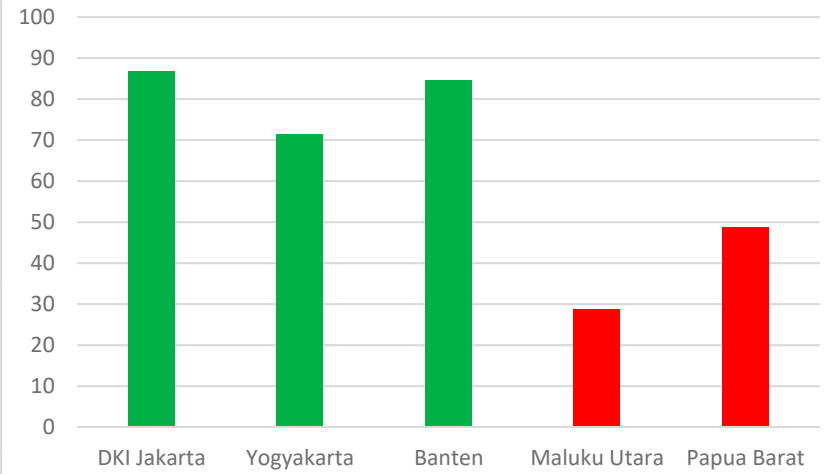
STATISTICS INDONESIA

Expectation Dimension

Average Expectation Value

Difference between IKrar and ISWI Expectation Dimension

the high value in Expectation Dimension is followed by the increase value than its IKraR

■ _2012 ■ _2013 ■ _2014 ■ _2015

STATISTICS INDONESIA

Conclusion

- ISWI is an extension of the current Indonesia Welfare Index, which includes social, economic, and government dimensions.
- The proposed welfare index is lower in areas with poor environmental quality.
- The digital dimension consider the digitalization effect on welfare that allows citizens to easily acquire information
- The individual expectation dimension indicates individual's belief in his/her ability to perform economic activities required in order to fulfill his/her primary in addition to other kinds of needs.

Thank You

Rendra Achyunda Anugrah Putra
BPS-Statistics Indonesia

Silvia Arini
BPS-Statistics Indonesia