



# INCORPORATING THE DELPHI INTO POVERTY MEASUREMENT

Discovering relevant Dimensions and Indicators of Poverty for Bogor City, West Java, Indonesia

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Putu Natih

This research is funded and supported by:



**LPEM FEB UI**  
UNIVERSITAS INDONESIA

INSTITUTE FOR ECONOMIC AND SOCIAL RESEARCH  
FACULTY OF ECONOMICS AND BUSINESS - UNIVERSITY OF INDONESIA



# Overall Thesis Background

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- ‘Poverty is a notoriously ill-defined term ... there is remarkably little consensus among social scientists on how best to measure the condition’ (Nolan & Whelan, 1996, p. 1).
- The core issue:

*To define and measure poverty in a way that is valid and meaningful in the area, country, or setting, where measurement is needed, to enable the formation of relevant and sound policies*



# Thesis Outline

1. Chapter 1: Introduction
2. Chapter 2: Theoretical Review
3. Chapter 3: Poverty Measurement and Alleviation in Indonesia
4. Chapter 4: A Comparative Review of Past and Current Measures of Multidimensional Poverty
5. Chapter 5: Methodological Steps of Incorporating the Delphi Method into Poverty Measurement
6. Chapter 6: Delphi Results
7. Chapter 7: Incorporating Delphi Results into a Quantitative Measure of Multidimensional Poverty
8. Chapter 8: Evaluation of the Different Measures
9. Chapter 9: Conclusion

# Summary of Chapter 4

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- Compared consumption poor vs. Global MPI poor vs. Adjusted MPI poor (Central Bureau of Statistics Indonesia (CBS) 2014; Alkire et al. 2016; Prakarsa 2016).
- Each measure identified both a different size (11.6% consumption poor, 22% Global MPI poor, 30% Adjusted MPI Poor) *and* composition of the poor.
- Reliance on any one of these measures as a single litmus test' of policy effectiveness, may thus be misleading, for each measure not only identified a different extent of poverty, but also categorised different types of households as poor.

## Weaknesses of existing measures

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- Ravallion (2012) points toward the arbitrariness in the selection of the measure's components; 'neither the menu of indicators nor the aggregation function is pre-determined from theory and practice' (p. 2).
- Nolan and Whelan (2011) argue that current applications of multidimensional poverty measurement more often than not exhibit 'weak links from concept to application', their 'implementation is thus rather ad hoc' (p. 5).
- Chiappero-Martinetti and von Jacobi (2012) state 'satisfactory justification of the full range of measurement problems resulting from these decisions', is crucially needed, however, rarely provided (p. 70).
- Chiappero-Martinetti and von Jacobi (2012) point toward the apparent lack of discussion with regard to how 'methodological choices (i.e. weights among indicators) and contextual factors', may influence a country's level of multidimensional poverty (p. 4).
- Sen (2004) and Robeyns (2005): the need for 'comprehensive outcomes' (which, why and how).

# Background to choice of Delphi (1/2)

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- The most important development of poverty research in recent years is the shift of emphasis from a uni- to a multidimensional approach to poverty (Kakwani & Silber, 2007).
- There needs to be at least some level of agreement with regard to the 'living conditions and amenities' considered as 'customary' within a society, to enable evaluation of whether a household or a person falls short from these customs (Townsend, 1979).
- The 'evaluative purpose' of the **Capability Approach** as a framework to understand poverty (Sen 1999, 4).
  - Even though Sen does not provide a set list, he argues for each 'group' to 'select' their own capabilities (Crocker 2008; Crocker and Robeyns 2009).
  - 'A single all-purpose list of capabilities would be incompatible with Sen's CA', however, through a 'procedural approach', the selection of capabilities could still be done (Robeyns 2003).
  - **Partial ordering and intersection rankings** (Sen 1973; Sen & Foster 1997).
  - 'There is growing consensus that poverty is multidimensional' (Grusky and Kanbur 2006), thus '**reaching consensus on the dimensions that matter**' is needed, as long as 'the reasons behind those choices are made explicit' (Alkire 2008; Robeyns 2005).
- Nussbaum vs Sen: List or No List? (Nussbaum 2000, 2003, 2006).



## Background to choice of Delphi (2/2)

- 'By using a series of intensive questionnaires interspersed with controlled feedback, the Delphi enables the attainment of the most reliable consensus of opinion of a group of experts' (Dalkey and Helmer, 1963)
- 'N heads are better than one' (Dalkey 2002).
- Characteristics of the Delphi: anonymity, controlled feedback, iteration and formal group judgment (Dalkey 2002).
- The Delphi 'allows for an alternative to the widely applied FGD, by ensuring anonymity, yet enabling participants to respond to and evaluate the answers of others' (Aichholzer, Bogner, Littig, & Menz, 2009, p. 269).
- It also: enables the participants to be part of both the exercise of defining and measuring poverty → the need for a 'logical line of deduction between definition and measurement (Ringen 1988).

# Research Question

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Using the Delphi approach:

Which dimensions and indicators of poverty are relevant for the people of Bogor City, West Java according to Bogor City policy makers?

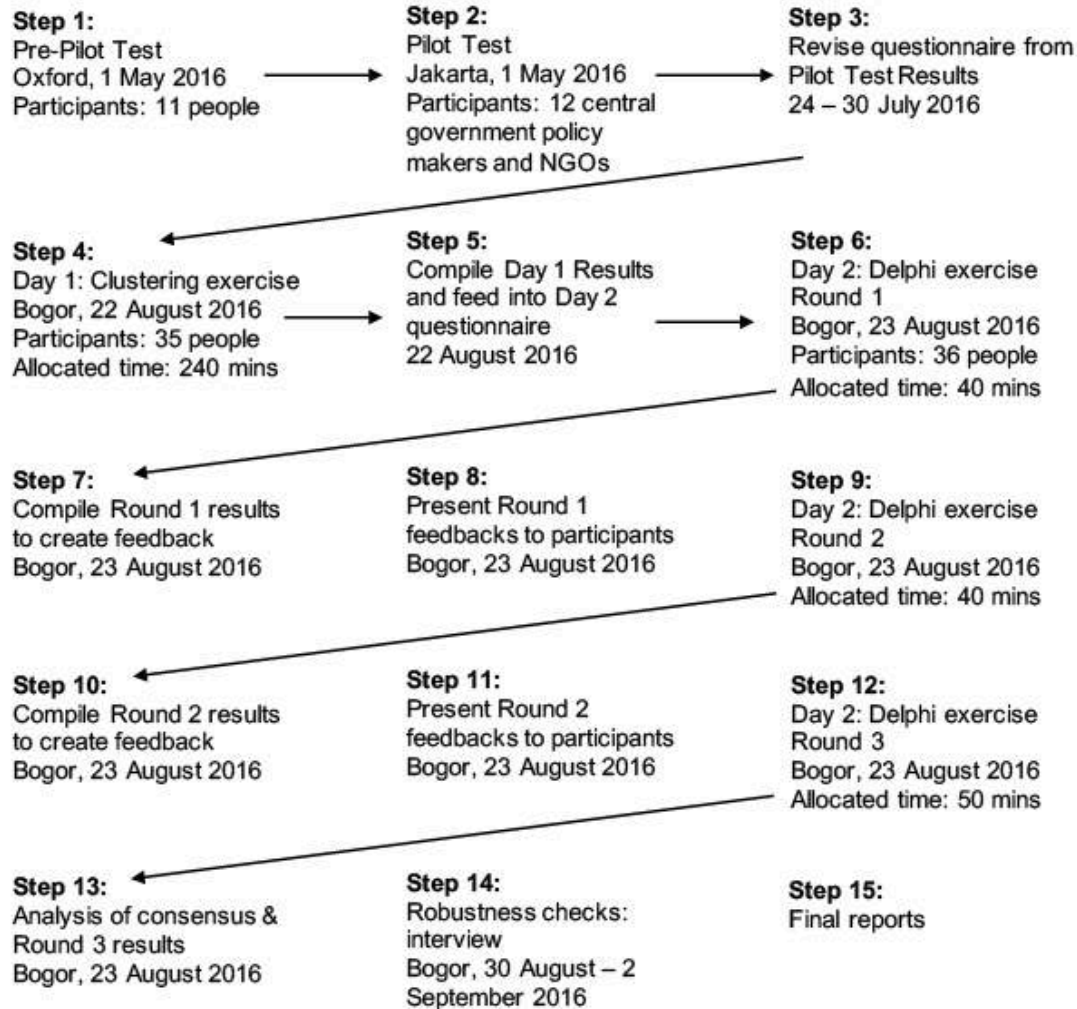






## The Delphi Process – (22<sup>nd</sup> – 23<sup>rd</sup> August 2016)

**Figure 1. The Bogor City Delphi Implementation Process**





# The Questionnaires

- **Clustering Questionnaire:**
  - Based on method developed within Dalkey (2002), although adapted in online form through the use of Qualtrics.
- **Pre and Post Delphi Questionnaire (for Robustness tests):**
  - Based on questions developed by Scheibe et al. (2002). (Refer also to: Van de Ven & Delbecq, 1974; Scheibe et al., 1975; Rohrbaugh, 1979; Boje & Murnighan, 1982).
- **Main Delphi Questionnaire:**
  - 3 rounds (Linstone and Turoff, 1975).
  - Participants were asked to answer questions as 'representatives of the Bogor City people'; **which dimensions and indicators of poverty are essential for a household in Bogor City to have in order to not live in poverty.**
  - Based on variables available within the Susenas Core Module 2013.
  - However, participants are able to report new dimensions/indicators that are not available in the choices given.

## The Clustering Questionnaire

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- Participants were asked to assign similarity scores (based on Dancy, 2002 exercise).
- Agglomerative clustering was conducted in R to calculate cluster dendograms from scores assigned to 378 pairwise comparisons.
- Elbow statistics, Silhouette Analysis Plots, and Gap plots, were calculated to determine cluster validation.
- Answer the below questions as 'representatives of the Bogor City people';

### *Rate the similarity level of the below indicators?*

Example questionnaire interface:

▼ CONTOH BLOCK Block Options ▼

Apakah pasangan indikator dibawah saling berhubungan?

⚙️ Isikan Skor "0" untuk menggambarkan pasangan indikator yang sangat berhubungan, sedangkan skor "4" untuk menggambarkan pasangan yang sangat tidak berhubungan.

✳️

Kemampuan Menjadi Pilot:

	0	1	2	3	4
Kemampuan Navigasi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kemampuan Berkomunikasi dengan Teman Kerja	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kemampuan Memasak	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kemampuan Mengerti Fisika	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kemampuan Menyetir Mobil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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# The Main Delphi Questionnaire

- Participants were asked to answer the below questions as ‘representatives of the Bogor City people’;

*How do you define poverty in Bogor City?*

*Would an aggregate or dashboard measure be more effective? If aggregate how many deprivations does a household has to experience to be considered as poor? If dashboard, how many dimensions should the dashboard consist of?*

*Which dimensions of poverty are essential for a household in Bogor City to have in order to not experience poverty? Which Indicators best represent these dimensions?*

*How should these dimensions be weighed against each other? Within a dimension, how should indicators be weighed against each other?*



## Example of Online Questionnaire Interface

**Q11**

Di antara dimensi di bawah ini, pilihlah dimensi yang esensial harus dipenuhi/dimiliki oleh rakyat Indonesia agar kehidupannya sejahtera? (Anda dapat memilih lebih dari 1 dimensi dan jika ada dimensi lain yang belum terdapat dalam daftar pilihan di bawah, Anda dapat menuliskan dimensi lain ini pada kategori 'Dimensi Baru')

- Karakter rumah tangga (kepemilikan kartu keluarga dan akte lahir, keamanan, kemampuan bepergian)
- Kesehatan
- Pendidikan
- Pekerjaan
- Kontrasepsi dan keluarga berencana
- Tempat tinggal yang layak
- Perlindungan Sosial
- Teknologi Komunikasi dan Informasi
- Dimensi Baru

Semakin penting sebuah "kelompok indikator" semakin besar skor penimbang yang harus Bapak/Ibu berikan.

» Kepemilikan Aset dan Kemampuan Bekerja	0
» Rasa Aman dan Kemampuan Hidup Sehat	0
» Akses pada Pendidikan	0
» Keluarga Berencana dan Kesehatan Anak	0
» Lingkungan, Tempat Tinggal yang Layak dan Bantuan Pemerintah	0
<b>Total</b>	<b>0</b>

1. Which dimension should be included within the poverty measure?

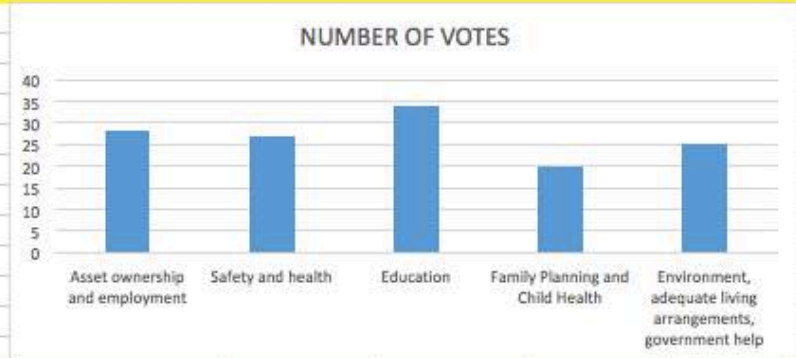
2. How should the dimensions be weighed? Total weight = 100 percent.



## Example of Feedback Between Rounds

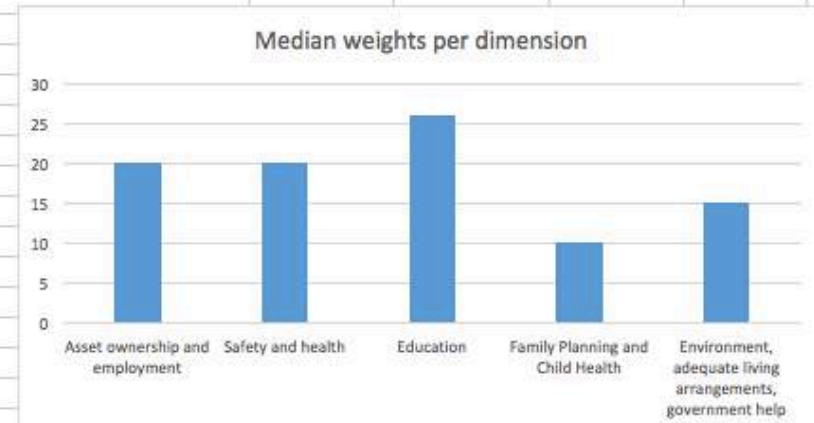
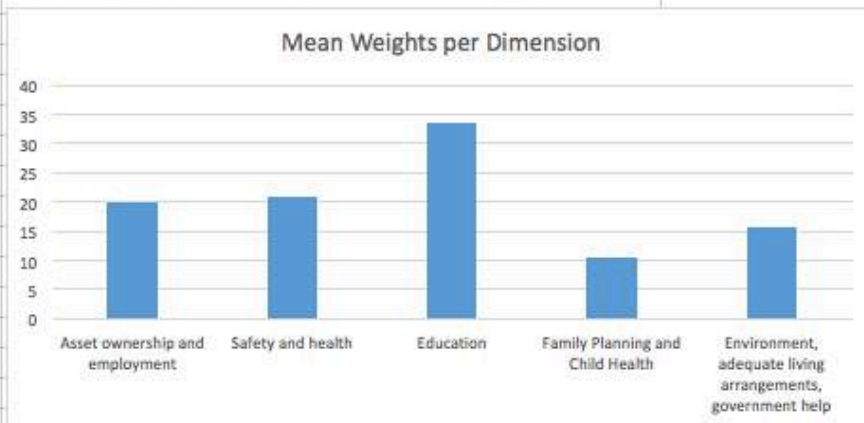
### DIMENSIONAL PERCENT VOTES

DIMENSION	NUMBER OF VOTES
Asset ownership and employment	28
Safety and health	27
Education	34
Family Planning and Child Health	20
Environment, adequate living arrangements, government help	25



### DIMENSIONAL WEIGHTS

DIMENSION	Minimum	Maximum	Mean Weights	Median weights	Std Deviation	Count
Asset ownership and employment	0	50	19.85	20	13.62	28
Safety and health	0	55	20.74	20	14.88	27
Education	0	70	33.44	26	14.62	34
Family Planning and Child Health	0	50	10.38	10	11.75	20
Environment, adequate living arrangements, government help	0	50	15.59	15	13.01	25



# Clustering Exercise (22<sup>nd</sup> August 2016) (1/2)

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# Delphi Exercise (23<sup>rd</sup> August 2016) (1/2)

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# Delphi Exercise (23<sup>rd</sup> August 2016) (2/2)

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## Profile of Delphi Respondents

- Bogor City policy makers (heads of government sectors, their deputies, civil servants) from the below sectors:

Health, education, social community, city planning, city hygiene, state development body, city communication and information sector, micro banking and small medium enterprises, city security and safety, agriculture, food sustainability sectors, all six *kecamatan*s of Bogor City (Bogor Barat, Bogor Selatan, Bogor Tengah, Bogor Timur, Bogor Utara and Tanah Sareal).

- Characteristics of Delphi respondents

Table 2. Demographic Characteristics of Delphi Respondents

Characteristics	N	%	Mean	Median	Min	Max
<b>Gender</b>						
Female	18	50				
Male	18	50				
<b>Age</b>			43.6	44	21	56
<b>Education Level</b>						
Elementary	0	0				
Secondary	0	0				
High School	5	13.89				
1 year or 2 year diploma	0	0				
3 year diploma	1	2.78				
Undergraduate	15	41.67				
Postgraduate masters level	13	36.11				
Doctorate level	2	5.56				
<b>How long have you worked within the Bogor City Government? (years)</b>			18.29	18	2	34



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# How Respondents Define Poverty

Before the Delphi exercise started respondents were asked an open ended question:

*How do you define poverty? What does poverty in Bogor City mean?*

Summary of 36 responses:

**Living below an adequately accepted standard of living, as a result of material deprivation, being deprived in health, education, having no employment, having no moral and mental support . People who are excluded from normal day to day life because of these deprivations. People who are not free and independent because of these deprivations.**

The Delphi answers were then encouraged to be driven by respondents' definitions.



# How Many Dimensions?

Questions:

1. Do you think these 28 indicators should be grouped into dimensions?
2. How many dimensions should these 28 indicators be grouped into to support the creation of an effective poverty measure for Bogor City?

Results:

Respondents agreed unanimously that the indicators should be clustered into dimensions.

Summary of the 36 responses:

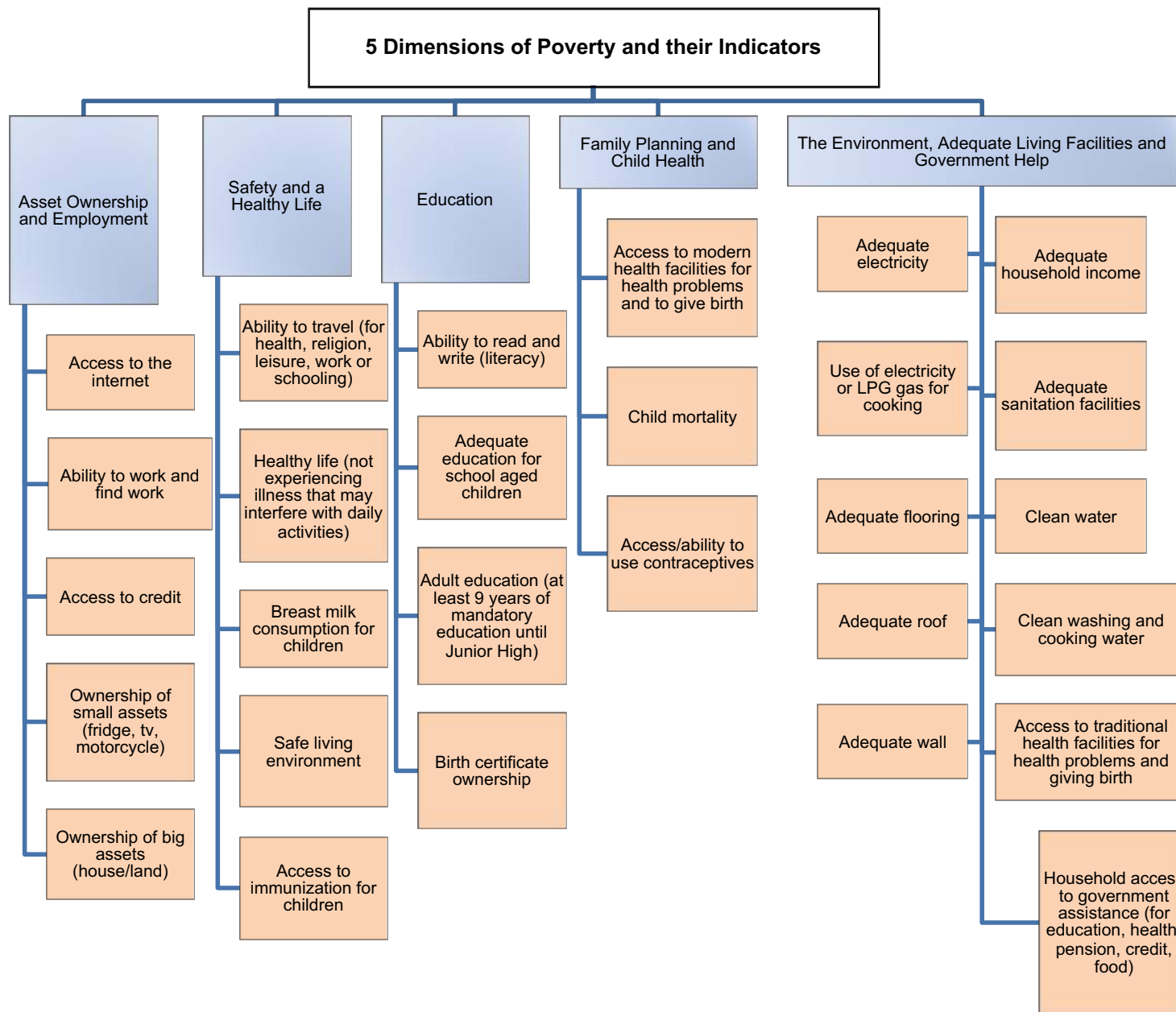
Min = 3

Max = 15

**Median = 5**

Mean = 6.6

**Mode = 5**

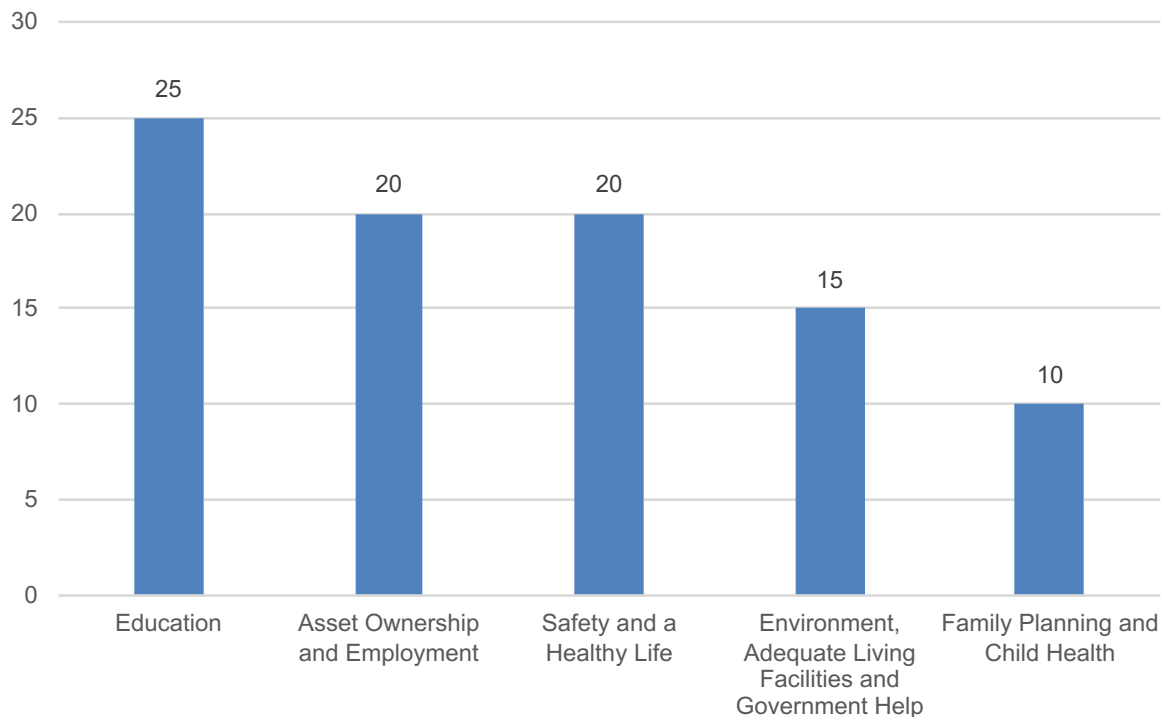


## Preliminary Delphi Results (median of round 3 dimensional weight results – in percentages)

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Median Weight



Dimensions according to importance:

1. Education
2. Safety and health
3. Asset ownership and employment.
4. Environment, adequate living facilities, government help.
5. Family planning.



## Delphi Robustness Tests

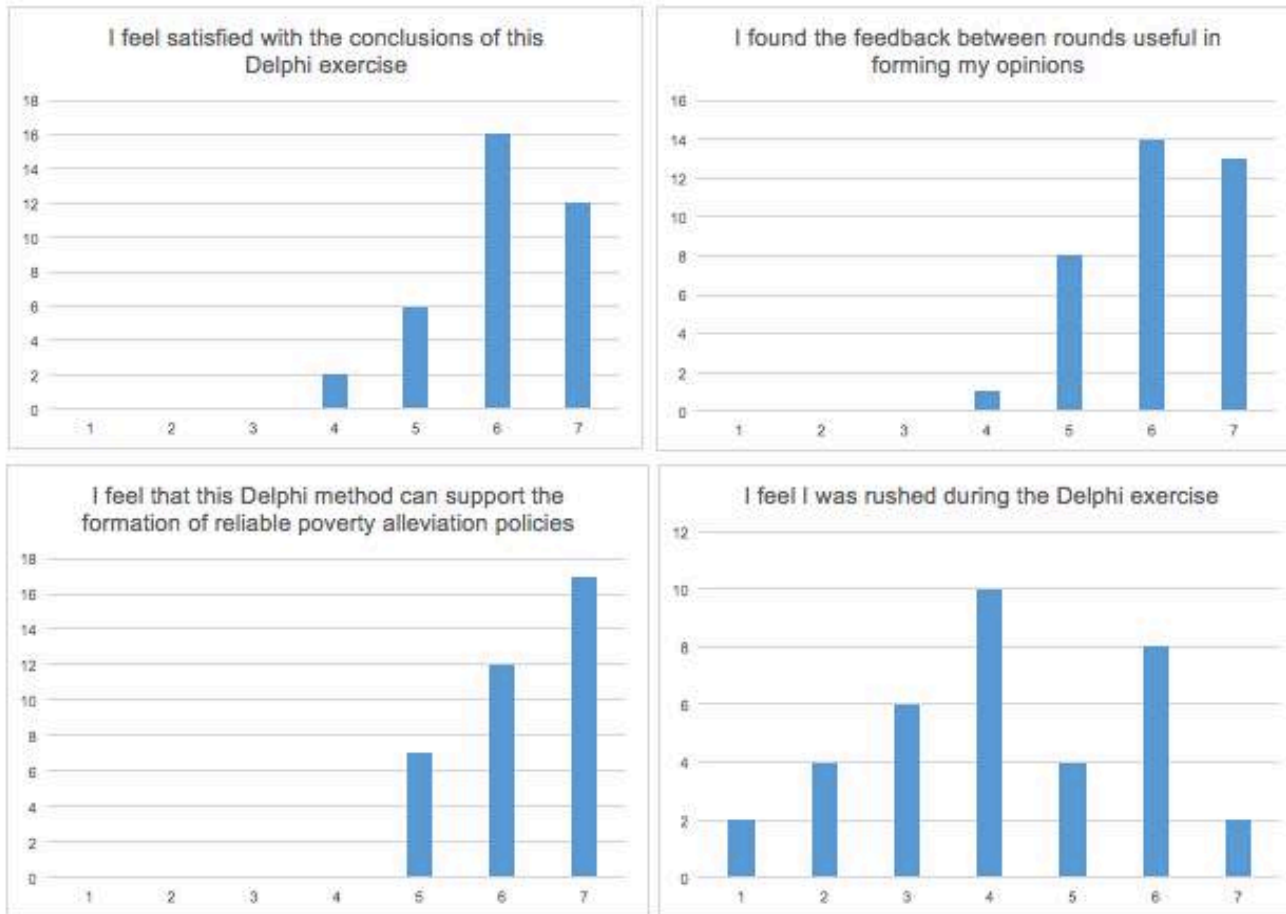
- The Delphi procedures are designed to meet the many concerns about group think, but they clearly need validation (Dalkey 2002).
- While compromise may be uncomfortable in any situation, the real danger is that participants may leave the process without really compromising their feelings at all (Scheibe et al., 2002).

### Method:

1. Analysis of Post-Delphi Questionnaire results – respondents' opinions on the Delphi process and conclusions.
2. Analysis of follow up interviews.



- Post-Delphi questionnaire results



(Likert scale: 1-strongly disagree with statement, 7 – strongly agree with statement)

- Interview Results (re-interviewed 10 randomly selected Delphi participants and 10 non-participants): asked first how they personally defined poverty, which dimensions and indicators they thought were important (without prompting them with the Delphi results), finally, showed them the Delphi results and asked them whether they agreed.



MNC 104.6FM  
**TRIJAYA**



Oxford-Inggris 26 Oktober 2016 - Wali Kota Bogor, Bima Arya Sugiarto, menyebutkan salah satu masalah penanggulangan kemiskinan di kota Bogor adalah minimnya data akurat yang dimiliki pemerintah daerah.

Bima menyampaikan hal ini dalam kunjungannya memenuhi undangan Perhimpunan Pelajar Indonesia (PPI) Oxford, Rabu siang.

Data BPS menyebutkan dari total populasi 1.030.720 jiwa, jumlah angka kemiskinan di kota Bogor tahun 2015 mencapai 9.289 keluarga atau 4,18 persen dari total penduduk.

## Kemiskinan di Kota Bogor



Kota Bogor kembali menorehkan namanya dikancah Internasional. Pasalnya Kota Bogor menjadi

kota pertama yang menjalin kerja sama dengan Oxford University. Hal tersebut disampaikan Mahasiswa S3 Kebijakan Sosial Putu Geniki Lavinia Natih yang melakukan audiensi dengan Walikota Bogor Bima Arya Senin (1/7/2016) di ruang Paseban Punta Balaikota. Kerja sama ini dalam bentuk workshop tentang Pemetaan Kemiskinan di Kota Bogor dengan output sebuah software statistik. "Software statistik ini bisa dimanfaatkan bagi penentuan kebijakan di Pemkot Bogor," ujar Niki sapaan akrabnya.

Niki menuturkan, awal dipilihnya Kota Bogor sebagai tempat penelitian sudah sejak satu tahun



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Oxford dan Pemkot Bogor Kerjasama Soal Masyarakat Urban

REPUBLIKA.CO.ID, BOGOR — Universitas Oxford, Inggris menjajaki kerjasama dengan Pemerintah Kota Bogor di bidang riset terkait isu kemiskinan dan masyarakat urban. Penjajakan kerjasama ini dibahas dalam pertemuan antara Wali Kota Bogor Bima Arya Sugiarto dengan Putu Geniki Lavinia Natih mahasiswa doktoral Universitas Oxford di Balai Kota Bogor, Senin (1/8).

Menurut Kasubag Kerjasama Antara Daerah dan Luar Negeri Sekretaris Daerah Kota Bogor Rudiana, ada waacana dari Universitas Oxford untuk membangun pusat penelitian terkait kemiskinan dan masyarakat urban di Kota Bogor.

"Keinginan dari Oxford untuk mendirikan pusat riset seperti laboratorium data kemiskinan dan populasi masyarakat urban yang ada di Kota Bogor," kata Rudiana.

Dia mengatakan, kerjasama dengan Oxford baru penjajakan awal yakni dengan mengimkan salah satu mahasiswa doktoral Oxford untuk melakukan penelitian tentang kemiskinan dan populasi masyarakat urban di Kota Bogor.

"Putu Geniki akan melakukan riset di Kota Bogor, setelah itu akan dilakukan workshop hasil dari penelitiannya tentang kantung kemiskinan. Wali Kota Bogor juga diundang sebagai dosen tamu untuk mengisi perkuliahan di Oxford bulan September mendatang," katanya.

Sementara itu Putu Geniki mengatakan memilih Kota Bogor sebagai objek penelitian karena digugakan oleh profesor pembimbingnya yang tertarik dengan kebijakan Pemerintah Kota Bogor dalam mengatasi persoalan kemiskinan.

"Profesor saya tertarik dengan Kota Bogor setelah membaca sejumlah artikel tentang kebijakan yang diadopsikan oleh Wali Kota Bogor yang cukup inovatif dan ramah terhadap dunia Kampus," kata NIH.

Melalui riset kemiskinan yang dilakukannya selama satu bulan ini, ia juga mendapat tugas untuk mengawal kerjasama antara Oxford dan Pemerintah Kota Bogor dalam bidang penelitian terkait kemiskinan dan masyarakat urban di Indonesia.

Mahasiswa S3 Jurusan Kebijakan Ekonomi tersebut menilai, Pemerintah Kota Bogor

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By: redaksi On: August 2, 2016

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BOGOR, PwriNewsOnline.com – Kota Bogor kembali menorehkan namanya dikancah Internasional. Pasalnya Kota Bogor menjadi kota pertama yang menjalin kerja sama dengan Oxford University. Hal tersebut disampaikan Mahasiswa S3 Kebijakan Sosial Putu Geniki Lavinia Natih yang melakukan audiensi dengan Walikota Bogor Bima Arya. Kerja sama ini dalam bentuk workshop tentang Pemetaan Kemiskinan di Kota Bogor dengan output sebuah software statistik.

"Software statistik ini bisa dimanfaatkan bagi penentuan kebijakan di Pemkot Bogor," ujar Niki sapaan akrabnya.

46% 5:23

TribunnewsBogor.com

## Mahasiswa Oxford University Bakal Lakukan Penelitian Soal Kemiskinan di Kota Bogor

Senin, 1 Agustus 2016 22:12

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Navigation icons: back, home, square, left arrow, right arrow, share, book, copy



## Preliminary conclusions

- Poverty is defined as living below an adequately accepted standard of living, no being involved in society because of deprivations experienced, not having the freedom and independent because of these deprivations.
- Dashboard measure is more effective and feasible.
- All 5 dimensions are important, although weighed differently (education, safety and health, asset ownership and employment, environment, and family planning).
- Policy implication: the need for a measure to monitor poverty at the local levels, to supplement current centralized measures.



# Incorporating the Delphi into poverty measurement

This research is funded and supported by:



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FACULTY OF ECONOMICS AND BUSINESS - UNIVERSITY OF INDONESIA*



Thank you very much