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Evaluation of the Right to Food with Food System Approach at the Provincial Level in Indonesia

Evaluasi Pemenuhan Hak Atas Pangan dengan Pendekatan Sistem Pangan di Tingkat Provinsi di Indonesia

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ABSTRACT

Background: The right to food is one of the human rights that must be protected and fulfilled. Inequality in priorities on food and nutrition security development causes a sharp distinction among provinces regarding food security achievement. Currently, methods for evaluating the right to food at the provincial level are not yet available.
Objectives: This study aims to analyze the right to food at the provincial level in Indonesia with a food system approach (food availability, food accessibility, and food utilization) using structural, process, and outcome indicators.
Methods: This study was a cross-sectional study using secondary data from 34 provinces in Indonesia. The data consist of regulations, programs, and the government's performance achievements. There were five data analysis stages: identification, selection, assessment indicators, provincial rankings provision, and the characteristics based on cluster analysis.
Results: Based on the evaluation of 36 selected indicators of the right to food, only three provinces were included in the high category, twenty-five provinces in the medium category, and six provinces in the low category. Central Java had the highest level of the right to food, while West Papua had the lowest level. Non-hierarchical clustering with K-Means methods was further applied to analyze the right to food and later divided into five clusters. The first until the third cluster was categorized as medium level, while the fourth and fifth clusters were categorized as low.
Conclusions: The right to food in western part of Indonesia had better than the eastern region. The availability of regulations and program implementations with adequate budget support will affect the government's performance in fulfilling the right to food.

ABSTRAK

Latar Belakang: *Hak atas pangan merupakan hak asasi manusia yang harus dilindungi dan dipenuhi. Ketidakmerataan penempatan prioritas pembangunan ketahanan pangan dan gizi menyebabkan perbedaan yang tajam antar provinsi dalam pencapaian ketahanan pangan. Saat ini, metode evaluasi hak atas pangan di tingkat provinsi belum tersedia.*
Tujuan: *Studi ini bertujuan untuk menganalisis hak atas pangan di tingkat provinsi di Indonesia dengan pendekatan sistem pangan (ketersediaan pangan, akses pangan dan pemanfaatan pangan) dengan menggunakan indikator struktural, proses dan outcome.*
Metode: *Studi ini merupakan studi cross sectional menggunakan data sekunder dari 34 provinsi di Indonesia. Data tersebut terdiri dari peraturan, program, dan capaian kinerja pemerintah provinsi. Terdapat lima tahapan analisis data yaitu identifikasi, seleksi, penilaian indikator, pemberian peringkat provinsi dan karakteristik berdasarkan analisis klaster.*
Hasil: *Berdasarkan evaluasi terhadap 36 indikator terpilih hak atas pangan, hanya tiga provinsi termasuk kategori tinggi, dua puluh lima provinsi kategori sedang dan enam provinsi kategori rendah. Provinsi Jawa Tengah memiliki tingkat hak atas pangan tertinggi, sedangkan Provinsi Papua Barat memiliki tingkat terendah. Pengklasteran non hierarki dengan metode K-Means digunakan lebih lanjut untuk menganalisis hak atas pangan dan kemudian dibagi menjadi lima klaster. Klaster pertama hingga ketiga dikategorikan sedang, sedangkan klaster keempat dan kelima dikategorikan rendah.*
Kesimpulan: *Adanya peraturan dan pelaksanaan program dengan dukungan anggaran yang memadai akan mempengaruhi kinerja pemerintah dalam pemenuhan hak atas pangan.*

INTRODUCTION

The Right to Food (hereafter, RTF) is one of the human rights that must be respected, protected, and fulfilled by member countries of the International Covenant on Economic, Social, and Cultural Rights[1] Law No. 11 of 2005 of the Republic of Indonesia as the ratification of covenant defines RTF as the right to get regular, permanent, and free access to adequate food, either directly or by purchasing, in both quality and quantity.[2]

The achievement of food security, which portrays the RTF, is more focused on the food availability subsystem than the food accessibility and food utilization subsystem, which means that it cannot be used as a standard for food security in a region. The reason is that the region's food availability does not guarantee to be easily accessed by a certain household if they are physically, economically, or socially incapable.[3] This matter further causes food and nutrition problems, such as the prevalence of malnutrition and stunting among children under five at the global level by 10.8% and 21.9%,[4] and at the national level by 7.95% and 30.8%.[5-6] To address food and nutrition problems, relevant improvements are needed within, and across the food system.[7] Furthermore, it is the most effective strategy to enhance food and nutrition security since focusing on the impacts in the different domains allows for an integrated assessment that can provide a framework to solve more complex problems.[8]

The decentralized government system in Indonesia gives the regional government the right to regulate their development goals[9] including food affairs, a mandatory government affair that is not related to essential services.[10] However, inequality in steps, effort, and priorities to fulfill the right to food cause a sharp distinction among provinces regarding food security achievement.[11] Differences in regional government priorities in the RTF need to be evaluated using a linear food system approach.

Due to that reason, several assessments of food and nutrition security have been developed at global and national levels. However, there has not yet been an available assessment to evaluate the RTF at the provincial level. Therefore, this study aims to analyze the RTF's fulfillment at the provincial level in Indonesia with a food system approach using structural, process, and outcome indicators.

METHODS

Design, Location, and Time

This study was cross-sectional using secondary data from 34 provinces in Indonesia. The data were collected by browsing the website of the relevant government agencies in each province. The research was conducted from March to September 2020 at Institut Pertanian Bogor (IPB) University.

Research Stages

The first stage of the research identified potential indicators through a literature review from the global and national levels. The authors then found 65 candidate indicators obtained from the Food Agriculture Organization (FAO), the Hunger and Nutrition Commitment Index (HANCI), and the National Food and Nutrition Action Plan. The candidate indicators were qualitatively selected based on three criteria: 1) the relevance to the food system concept, 2) the elimination of redundancy, and 3) the data available at the provincial level. Then, there were 36 selected indicators which consist of 13 indicators of food availability, 12 indicators of food access, and 11 indicators of food utilization.

To analyze the RTF's fulfillment at the provincial level in Indonesia, the authors used three indicators: structural indicators, process indicators, and outcome indicators. Additionally, the scoring system for all indicators ranged from 0-to 3 based on specific criteria. The first indicator, the structural indicators, was assessed based on the availability of legal documents issued by the provincial government. The regulations are divided into Regional Regulations and Governor's Regulations/Decree.[12] The 0 score was given if there were no regulatory documents, score 1 for the availability of governor's decrees, score 2 for the availability of governor's regulations, and score 3 for regional regulations. Process indicators, furthermore, were assessed based on the availability of programs with budget support. Score 0 was given if there was no program or for a program using an average provincial government budget less than 60% of the average government budget, score one if the budget was between 60-79.9%, score two if the budget was between 80-99.9%, and score three if the budget more than 100%. Lastly, outcome indicators were assessed based on the performance achievement based on the Minister of Finance Regulation No. 214 of 2017 on Performance Measurement and Evaluation of the Implementation of the Work Plan and Budget Ministry. Score 0 was given if the performance achievement was unsuccessful (less than 60%), score one if it was quite successful (60-79.9%), score two if it was successful (80-99.9%), and score three if it was very successful (more than 100%).

The score for all indicators was then calculated in the aggregate score with the same proportion to describe the level of the right to food for each province, which was later categorized into low, medium, and high levels. The categorization of provinces was completed by employing the formula of mean$\pm$SD. The score was considered in the low category if it was less than mean-SD, in the medium category if it was between mean-SD and mean+SD, and in the high category if it was more than mean+SD. The characteristic analysis began with non-hierarchical clustering techniques with the K-Means cluster method before being analyzed descriptively based on the existing indicators.

Data Collection and Analysis

The data consist of regulations, programs, and performance achievements for each indicator in the food subsystem. Regulatory data consist of regional regulations, governor's regulations, and governor's decrees. Programs and budget data were obtained from the Regional Government Working Plan and/or the relevant Regional Government Agency Working Plan. Performance achievement data were obtained from the Governor's Accountability Statement Report and/or the appropriate Regional Government Agency's Performance Report. Data processing and analysis were carried out using Microsoft Excel 2010 and IBM SPSS version 16.0. The qualitative data were quantified by scoring methods and analyzed descriptively to determine the level of the right to food.

RESULTS

Evaluation Indicator of the Right to Food

Evaluation of the right to food was completed using indicators that have been selected. In brief, 36 selected indicators, are reflected in Table 1.

Table 1. Selected indicators for evaluating the Right to Food with food system approach at the provincial level in Indonesia

Indicators	Availability	Accessibility	Utilization
Structural	− Regulations on agricultural production increase (subsidized fertilizer) − Regulations on agricultural production increase (irrigation) − Regulations on the government food reserve − Regulations on sustainable food crops agricultural land protection − Regulations on agricultural extension	− Food pricing policy − Regulations on poverty reduction − Regulations on labor protection − Regulations on social welfare (food safety net)	− Regulations on food consumption based on the balanced diet − Regulations on food safety control − Regulations on water supply
Process	− Increase in agricultural production − Increase in energy and protein availability − Strengthening of the government food reserve − Implementation of agricultural extension	− Food distribution and food price stability − Empowerment of poor society − Labor protection and improved access to employment − Empowerment of people with social welfare problems	− Food diversification − Food quality and safety − Increase in clean water access − Improvement of community nutrition
Outcome	− Percentage of the increase in agricultural production − Availability of energy and protein − Percentage of government food reserve − Coverage of agricultural extension services	− Food price stability through the coefficient of variation − The proportion of the population living in poverty − Increase in the unemployment rate − Percentage of population obtaining social welfare	− Quality of food consumption − Percentage of food safety − The proportion of the population with access to clean water − Percentage of malnourished children under five

Indicator characteristics of the right to food evaluations

Structural indicators were measured by establishing regulations as government commitment to fulfill the RTF,[1] which in this study, consists of Regional Regulations, Governor's Regulations, and Governor's Decrees. Process indicators were reflected in the programs and budget allocation to implement the government's commitment.[1] Budget allocation further indicated that the provincial government gives priority to implementing the plan.[13] Outcome indicators aimed to measure the accountability or performance achievement made by the provincial government.[11] Accountability can be interpreted as a form of government responsibility for program implementation in achieving goals and objectives through accountability that is carried out periodically.[14]

In general, the availability of regulations and program implementations with adequate budget support will affect the government's performance in fulfilling the right to food. The increase in agricultural production was achieved very successfully (performance achievement > 100%) by 15 provinces and was successfully achieved (performance achievement 80-99.9%) by 11 provinces. Furthermore, this performance achievement was supported by the governor's regulations on subsidized fertilizers (27 provinces), regional regulations on irrigation (16 provinces), and regional regulations on sustainable food crop agricultural land protection (34 provinces), as well as programs and budget allocation in agricultural production. The provincial government's

commitment to developing food and nutrition security needs to be increased by making regulations and policies and budgeting for handling food and nutrition problems.[15] Moreover, as much as 90.7% of regional government performances were influenced by factors of participation in budgeting, quality of human resources, and Government Internal Control Systems.[14] In other words, it can be argued that measurable budget goals[16] and compliance with regulations significantly affect performance outcomes.[17]

Evaluation of the right to food at the provincial level

The evaluation of the RTF for each province was categorized into high, medium, and low categories. As a result, it was obtained that only three provinces belonged in the high category, twenty-five provinces in the medium category, and six provinces in the low category. The scores, ranks, and categories of the RTF's fulfillment are further reflected in Table 2.

Table 2. Score, rank, and category of the Right to Food's fulfillment in 34 provinces in Indonesia

Province	Availability		Accessibility		Utilization		Aggregate Score	
	Score	Category	Score	Category	Score	Category	Score	Category
Central Java	85	High	78	High	82	High	81	High
South Kalimantan	74	High	81	High	82	High	79	High
West Sumatra	82	High	73	High	73	High	76	High
East Java	64	Medium	78	High	73	High	71	Medium
Banten	62	Medium	78	High	70	Medium	69	Medium
Central Sulawesi	82	High	64	Medium	61	Medium	69	Medium
North Sulawesi	67	Medium	69	Medium	70	Medium	69	Medium
West Nusa Tenggara	64	Medium	67	Medium	76	High	69	Medium
Bali	54	Medium	75	High	79	High	69	Medium
Bengkulu	72	Medium	64	Medium	67	Medium	68	Medium
South Sumatra	67	Medium	67	Medium	70	Medium	68	Medium
Aceh	49	Low	86	High	67	Medium	67	Medium
West Sulawesi	77	High	61	Medium	58	Medium	66	Medium
Special Region of Yogyakarta	69	Medium	67	Medium	61	Medium	66	Medium
West Java	51	Medium	72	Medium	76	High	66	Medium
Bangka Belitung	64	Medium	58	Medium	73	High	65	Medium
Lampung	79	High	42	Low	70	Medium	64	Medium
DKI Jakarta	49	Medium	86	High	55	Medium	63	Medium
Gorontalo	49	Medium	75	High	67	Medium	63	Medium
West Kalimantan	64	Medium	47	Medium	76	High	62	Medium
East Kalimantan	69	Medium	47	Medium	64	Medium	60	Medium
Riau Islands	54	Medium	67	Medium	61	Medium	60	Medium
South Sulawesi	62	Medium	56	Medium	48	Medium	56	Medium
Jambi	69	Medium	44	Low	52	Medium	56	Medium
North Kalimantan	62	Medium	50	Medium	52	Medium	55	Medium
Riau	56	Medium	56	Medium	45	Low	53	Medium
North Sumatra	69	Medium	31	Low	55	Medium	52	Medium
Central Kalimantan	56	Medium	47	Medium	48	Medium	51	Medium
East Nusa Tenggara	64	Medium	33	Low	33	Low	44	Low
Southeast Sulawesi	62	Medium	17	Low	42	Low	41	Low
Maluku	44	Low	47	Medium	27	Low	40	Low
Papua	38	Low	42	Low	27	Low	36	Low
North Maluku	38	Low	22	Low	33	Low	31	Low
West Papua	18	Low	25	Low	24	Low	22	Low

Three provinces with the highest RTF level were Central Java, South Kalimantan, and West Sumatra, with scores of 81, 79, and 75, respectively. The high scores obtained were supported by the high evaluation score of food access and utilization subsystems, which determine the fulfillment of RTF after food availability is fulfilled. Furthermore, the marking indicators comprise increased agricultural production, government food reserves, poverty, unemployment rates, food diversification, access to clean water, and improvement of community nutrition.

West Papua, North Maluku, Papua, and Maluku Provinces were four provinces that obtained the lowest scores, 22, 31, 36, and 40, respectively. Based on each subsystem's scores, West Papua Province generated the weakest scores for food availability and food utilization, while North Maluku Province obtained the lowest food access subsystem score. Moreover, these four provinces were very weak in several indicators, namely the availability of energy and protein, government food reserves, agricultural extension, food price stability, poverty, unemployment rates, food consumption, food safety, and access to clean water.

In general, Indonesia's western part had a better Food Security Index than the eastern region. Central Java, South Kalimantan, and West Sumatra

Provinces were in the top ten, while West Papua and Papua Provinces were the lowest in the Food Security Index.[18] In line with that, the western part of Indonesia also had a better condition due to infrastructure support and public awareness in realizing food and nutrition security.[19]

Cluster analysis of the RTF fulfillment at the provincial level

Cluster analysis was used to find provinces that have a similar level of the RTF. This study used five clusters, assuming that the least iteration (reallocation of clusters related to cluster center changes) is used.[20] Cluster one, three, and two obtained the aggregate scores of 69, 65, and 50, respectively, and were included in the medium category. Clusters five and four, meanwhile, had aggregate scores of 42 and 33 and were included in the low category (Table 3)

Table 3. Provincial clustering of the Right to Food's fulfillment in Indonesia based on the aggregate scores and categories

Cluster	Province	Aggregate Score and Category
1	Aceh, Riau Islands, Bengkulu, Central Java, Bali, South Kalimantan, North Sulawesi, and Gorontalo	69 (medium)
2	North Sumatra, Riau, Lampung, and Southeast Sulawesi	50 (medium)
3	West Sumatra, Jambi, South Sumatra, Bangka Belitung, DKI Jakarta, Banten, West Java, Special Region of Yogyakarta, East Java, West Nusa Tenggara, West Kalimantan, East Kalimantan, North Kalimantan, Central Sulawesi, South Sulawesi, and West Sulawesi.	65 (medium)
4	Maluku, Papua, and West Papua	33 (low)
5	East Nusa Tenggara, Central Kalimantan, and North Maluku	42 (low)

Based on Figure 1 below, cluster one achieved the highest RTF level, indicated by a positive gap in almost all indicators. The remarking indicator in the food availability subsystem, moreover, was the increase in agricultural production. The availability of regulations arguably supports very successful performance as achieved by five provinces and successful performance as achieved by two provinces. The regulations include governor's regulations on subsidized fertilizers issued by six provinces, regional regulations and governor's regulations on irrigation issued by four and three provinces, regional regulations on sustainable food crop agricultural land protection issued by eight provinces, and the implementation of programs to increase the agricultural production issued by eight provinces. Poverty reduction and labor protection programs, additionally, were the strengths of the food access subsystem. Moreover, all provinces have established regulations on poverty reduction and labor protection in regional regulations and governors' regulations. Programs and budget support further support those regulations; thereby, six provinces achieved very successful performance, and two provinces achieved successful performance. The indicator that becomes the strength in the food utilization subsystem was the quality of food consumption. Food diversification was one of the main subsystems in realizing food security, concerning the nutritional concept that no single type of food is nutritionally complete, according to human needs for a healthy life.[21] The implementation of a program to increase food diversification by all provinces had supported very successful performance achieved by six provinces and successful performance by two provinces. However, there were several priorities that the provincial government still needs to improve, such as regulations on agricultural extension and the achievement of agricultural extension service coverage.

Figure 1. Cluster analysis of the Right to Food with Food System Approach In Indonesia

By referring to Figure 1, the RTF level in cluster three and cluster two was categorized in the medium category. In cluster three, the outstanding indicator in the food availability subsystem was the availability of programs to increase energy and protein availability. Furthermore, there were 11 provinces with very successful performance and four provinces with successful performance. In the food access subsystem, food price stability was the primary factor, in which very successful performance was achieved by eight provinces and successful performance by one province. Food price stability further supports the high achievement of food access, thereby encouraging food and nutrition security index after food availability is fulfilled.[22] The quality of food consumption was the outstanding point of the food utilization subsystem, where seven provinces achieved very successful performance and nine provinces with successful performance. Nevertheless, several indicators still need to be improved, for instance, programs to increase agricultural production, efforts to reduce poverty, labor protection, and community nutrition improvement.

Cluster two was the second cluster that belonged in the medium category with negative gaps in food access and utilization subsystems. In detail, the gaps were discovered in several indicators, such as regulations on and programs for food price stability, poverty reduction, labor protection, empowerment of people with social welfare problems, regulations on food diversification, food safety, and access to clean water. Therefore, it can be further argued that the provincial government in this cluster needs to make improvements in both the food access and utilization subsystems.

The low level of the RTF was noticed in cluster five and cluster four. In cluster five, negative gaps were discovered in most indicators, except for programs to increase energy and protein availability, agricultural extension, labor protection, and empowerment of people with social welfare problems. In other words, it is necessary to make comprehensive improvements in all food subsystems, especially in the indicators of increasing agricultural production and the percentage of government food reserves because they have relatively large negative gaps. The RTF improvement also needs to be carried out in stages, starting from the provision of regulations, adequate budget support, and program implementations to achieve good performance targets.

Cluster four obtained the lowest RTF level, characterized by negative gaps in almost all indicators. Following the Food Security Index, Papua and West Papua Provinces were included in group 1 (very vulnerable), and Maluku Province was included in group 3 (vulnerable).[21] Thus, many things need to be improved by the provinces included in this cluster, including agricultural production, government food reserves, energy and protein availability, agricultural extension, food price stability, poverty reduction, labor protection, empowerment of people with social welfare problems, food diversification, food safety, access to clean water, and nutrition improvement.

CONCLUSION

The availability of regulations (structural indicators) and the implementation of programs with adequate budget support (process indicators) will affect the government's performance (outcome indicators) in fulfilling the right to food. The provincial government's commitment to fulfilling the right to food is shown by adequate programs and budget support to solve food and nutrition problems. There were three provinces with the high category in the RTF level's categorization, twenty-five provinces with the medium category, and six provinces with the low category. In general, the western part of Indonesia had better scores than the eastern region. Moreover, the highest level of RTF was found in Central Java Province, while the lowest was found in West Papua Province. Cluster analysis was used to find provinces with a similar RTF level, and in this study, five clusters were recorded. In brief, clusters one, three, and two were included in the medium category. In contrast, clusters five and four were included in the low category.

ACKNOWLEDGEMENT

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