

Enhancing food security to support the sustainable development goals through public sector accounting policy reform in Indonesia

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Abstract. This study aims to explore the impact of public sector accounting policy reform on the food security budget in Indonesia to support the SDGs. The transformation of accounting policy from cash basis to cash towards accrual and based on PP 71 of 2010 to accrual basis is believed to impact the food security budget. This study processes food security budget data obtained from the APBN 2011-2023 and changes in accounting policies throughout the years. The result of the study using linear regression analysis shows that there is a significant influence between accounting policy transformation and the food security budget. To support the SDGs mission, accounting policy reform is needed because it can affect the food security budget. Accrual basis accounting policy allows financial reports to be presented in a transparent and accountable manner so that it can encourage supervision of the use of the food security budget and planning in the upcoming year more effectively and efficiently.

1 Introduction

As one of the largest archipelagic countries in the world, Indonesia faces a major challenge in ensuring one of the missions of the sustainable development goals, namely to ensure food security for its growing population. Food security cannot be separated from Law No. 18 of 2012 concerning Food. It is stated in the Law that Food Security is "the condition of food fulfillment for the state and individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with religion, belief, and community culture, to be able to live healthy, active and productive lives in a sustainable manner"[1]. The Food Law not only talks about food security but also clarifies and strengthens the achievement of food security by realizing food sovereignty with food independence and food safety. In achieving this goal, the government

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needs a strong public sector policy framework, especially in financial management and accounting.

The Indonesian government only introduced government accounting in 2003. Previously, government budget accountability was limited to presenting State Budget Calculations (PAN) which only presented information regarding state income and expenditure. A new era began with the publication of Law No. 17 of 2003 concerning State Finances which requires the President to submit a Bill on accountability for the implementation of the APBN to the DPR in the form of a financial report [2]. The LKPP itself was only prepared for the 2004 budget year and was reported in 2005. Because the Government Accounting Standards (SAP) themselves were only ratified for the first time in 2005. The most visible thing is the change in the basis of government accounting from Cash Toward Accrual-to-Accrual base which would be determined through government regulation (PP) no. 71 of 2010, which would be implemented no later than 2015 [3].

With this change in accounting basis, Indonesia has begun to apply international best practices so that international confidence in good governance in Indonesia is increasing. Furthermore, the Directorate General of Treasury is also carrying out modernization by expanding the scope of guidance of financial reports to regional governments. So, in the future, LKPP will be able to present the financial situation.

Accrual-based government accounting standards are accounting standards that recognize income, expenses, assets, debt, and equity in financial reporting on an accrual basis, as well as recognizing income, expenditure, and financing in budget implementation reporting based on the basis set out in the APBD. The accrual basis is an accounting basis that recognizes the effect of transactions and other events when the transactions and events occur, without regard to when cash or cash equivalents are received or paid. The benefit of this accrual basis is that it provides an overall picture of government finances, presents actual information regarding the rights and obligations of the government's position, and is useful in disseminating government performance regarding service costs, efficiency and achievement of goals. Although the effectiveness of the government's basic implementation of accrual accounting is still at a sufficient level, it has a significant impact on the quality of the government's fiscal transparency [4]. For the food security sector, accurate and timely accounting information is very important. This will create budgets, planning and implementation of policies to increase food production, improve governance of agriculture, livestock and fisheries and ensure that Indonesian people have easy access to nutritious food.

The change from a cash basis (PP No. 24 of 2005) to an accrual basis (PP No. 71 of 2010) certainly has an impact on changes in the elements of financial statements that must be reported by the government. In PP No. 24 of 2005, the mandatory government financial reports are the Budget Realization Report, Balance Sheet, Cash Flow Report and Notes to the Financial Statements [5]. Financial Statements. In PP No. 71 of 2010 which is accrual-based, the government prepares financial reports consisting of the Balance Sheet, Operational Report or Financial Performance Report (LKK), Equity Change Report (LPE), Cash Flow Report and Notes to the Financial Statements, the government also prepares Budgetary Reports consisting of the Budget Realization Report (LRA) and the Report on Changes in the Surplus Budget [3].

This transition to a government accounting system is not without challenges. A study about the analysis of Food Security Development in Indonesia which was analyzed using big data and data mining, found that although there was an increase in food availability and access, significant disparities were found in various regions [6]. Accurate and timely data required by accrual-based government financial reporting, emphasizes comprehensive, accountable and transparent reporting which allows the gap to be overcome by enabling the government to make better decisions regarding resource allocation and more food security policy interventions right on target.

A Method to assess food security is to examine the Prevalence of Undernourishment (PoU) figure. The PoU indicator is the proportion of the population in an area that consumes food lower than the energy sufficiency standard to be able to live a healthy, active and productive life. From 2017 to 2019, PoU decreased from 8.23% to 7.63%. However, since 2020-2022 PoU has continued to increase by 0.71% to 8.34%, in 2021 it increased to 10.21% in 2022. For 2023, the PoU figure decreased to 8.53%. However, this figure is still below the target of the mandate of Presidential Decree 111 of 2022 concerning the Implementation of the Achievement of Sustainable Development Goals of 5% in 2024. From these data, it can be said that in 2023, as many as 8.53% of the Indonesian population consumed food lower than the standard to be able to live a healthy, active and productive life.

Food security in Indonesia is also measured by the Food Security Index (IKP), which is compiled by the National Food Agency. IKP considers various dimensions of food security, including availability, access, utilization and stability. Effective public financial management, facilitated by accrual-basis accounting, can influence these dimensions significantly. In terms of availability, precise financial reporting ensures that investments in agricultural infrastructure, research, and development are accurately tracked and evaluated. This strict control facilitates increased food production and availability. From an access perspective, efficient resource allocation, enabled by improved accounting practices optimizes food distribution systems. Consequently, this ensures that food supplies reach all regions, particularly vulnerable and remote areas, thereby addressing disparities in food access. In addition, in terms of utilization, better financial oversight supports programs aimed at improving food quality and safety, as well as public health initiatives that encourage proper nutrition and food use. Finally in terms of stability, better fiscal discipline and transparency reduce the risk of poor financial management, ensure resources are available to respond to food security crises and stabilize food supplies and prices.

Research related to budget policy studies in order to support food security development has been studied by Gunawan [7] where the results of this study found that the food security budget still focuses on availability and distribution, while for the consumption and nutritional status subsystems, it is still very lacking. Another study on the analysis of agricultural sector budget allocation for food security has also been conducted by Mustikaningsih [8]. This study found that the agricultural budget has a positive effect on food security. Furthermore, this study found that when the Government decided to provide an additional budget for training courses, it would only reduce crop production. Among the various studies on food security, this study attempts to capture the noble goal of the SDG "Zero Hunger" which is reflected in the food security budget and is thought to be influenced by the transformation of accounting policies in Indonesia. This research will explore the importance of public sector accounting policy reform in Indonesia as a strategic approach to increasing food security, with the focus of this research studying the transition of government accounting policy from cash basis to cash towards accrual basis and to accrual basis as regulated in Government Regulations Number 24 of 2005, and finally became the accrual basis regulated in Government Regulation (PP) No. 71 of 2010 concerning Government Accounting Standards which will be fully implemented in 2015 and the impact of the budget on Indonesia's food security.

This research aims to explore the impact of public sector accounting policy reforms on the food security budget to support SDGs in Indonesia. Specifically, this study aims to analyze the implications of the transition of accounting policies from a cash basis to an accrual basis which can have an impact on increasing financial transparency, accountability and resource management in the public sector with its correlation to the trend of food security budget in the APBN.

2 Methods

This research uses a quantitative approach with descriptive methods and correlation analysis to explore the impact of public sector accounting policy reform on the budget of food security spending in Indonesia. Quantitative research methods are methods that are based on the philosophy of positivism, used in researching samples and research populations [9].

This research looks at the implications of the transformation of government accounting standards from a cash basis regulated in PP 24 of 2005 to an accrual basis regulated in PP 71 of 2010 which focuses on financial transparency, accountability and resource management in the public sector, as well as its relationship with food security budget trends in the APBN and its realization in the LKPP.

2.1 Data source

This research collects secondary data consisting of (1) Food Security Budget Data, Food security budget data contained in the State Revenue and Expenditure Budget (APBN) from 2011 to 2023. Includes total food security budgets in ministries and institutions such as: Ministry of Agriculture, Ministry of Maritime Affairs and Fisheries, Ministry of PUPR and Ministry of Social Affairs. Other food security budgets are also collected from non-ministerial and institutional budgets such as subsidy budgets, other expenditures and special regional allocation funds (DAK). (2) Regulations Related to Government Accounting Policy, Law Number 17 of 2003 concerning State Finances, Government Regulation Number 24 of 2005, and Government Regulation Number 71 of 2010.

2.2 Data collection procedure

The data collection by procedures namely; (1) Collection of Budget and Realization Data, Food security budget data from the 2011 to 2023 APBN; (2) Literature Review, conduct a literature review of regulations and policies relating to government accounting standards, including Law Number 17 of 2003, PP Number 24 of 2005, and PP Number 71 of 2010; (3) Documentation, Collect and document regulations, reports and other documents relevant to public sector accounting policies and food security.

2.3 Data analysis technique

Budget data for food security will be analyzed descriptively to see trends from 2011 to 2023. This analysis will include calculating averages, percentages, and data visualization in the form of graphs and tables. Besides that, the correlation analysis will be used to measure the relationship between the implementation of accounting policies with budget trends of food security. To analyze the effect of accounting reform on the food security budget, linear regression will be used. This model will help identify how much influence the independent variable (implementation of accounting policies) has on the dependent variable (the food security budget).

The regression analysis that will be carried out is a simple linear regression to see the influence of accounting policies on the food security budget. The general formula for linear regression is:

$$Y = \alpha + \beta X$$

Where:

Y is the dependent variable (Food Security Budget)

X is the independent variable (Accounting Policy, 0 for Cash Towards Accrual, 1 for Full Accrual Base)

α is the intercept (Y value when X = 0)

β is the slope or regression coefficient (the effect of changing 1 unit of X on Y)

2.4 Hypothesis

The main hypothesis (H_0) is accounting policies do not have a significant influence on the food security budget. The alternative hypothesis (H_1) is accounting policies have a significant influence on the food security budget.

3 Result and Discussion

3.1 Result

3.1.1 Descriptive analysis

During the transition period from a cash basis to an accrual basis, we know that there is a cash towards accrual government accounting standard. The food security budget during this period has increased from around IDR 38 trillion in 2011 to around IDR 68 trillion in 2013. In 2014, the budget decreased slightly to around IDR 67 trillion. In 2015, this year was determined to be the final year for adapting government accounting standards to the accrual basis. All regional governments, ministries and institutions are required to use the accrual basis for their accounting records. In the first year of the full adoption of the accrual base system, the food security budget increased sharply to around IDR 111 trillion. The budget peaked in 2016 at around IDR 117 trillion. After that, it decreased sharply in 2017 to around IDR 103 trillion and continued to decline until it reached around IDR 74 trillion in 2020. Starting in 2021, the budget increased again to around IDR 86 trillion and remained stable until 2023 reaching around IDR 93 trillion.

This graph shows that the change in accounting policy from the Cash Towards Accrual-to-Accrual Base system coincided with a sharp increase in the food security budget in the early years of its implementation. Although there have been fluctuations, there has been a trend of increasing again in recent years. Changes in accounting policies appear to have had a significant impact on food security budget allocations, as can be seen from the sharp increase in the budget after the implementation of the new policy in 2015.

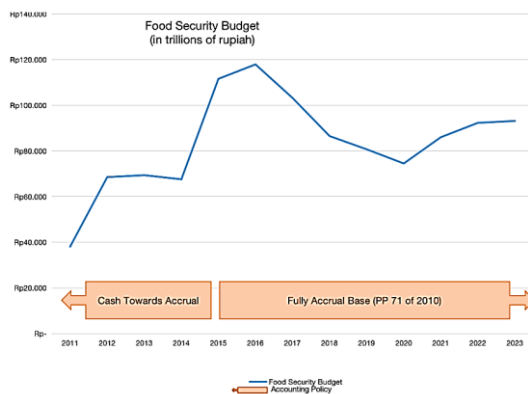


Fig. 1. Food security budget trends during the accounting policy transition period

3.1.2 Correlation Analysis

A correlation value that is close to -1 or +1 means that the relationship is getting stronger. A value above zero indicates a positive correlation, while a value below zero indicates a negative correlation. A positive value indicates the direction of the relationship is unidirectional. This means that if X goes up, then Y goes up. From Table 1 it can be concluded that the correlation value between the food security budget and accounting policy is in a strong and positive relationship. Where every change in accounting policy will increase the food security budget.

Table 1. Correlation Analysis

	Food Security Budget	Accounting Policy
Food Security Budget	1	
Accounting Policy	0.751256303	1

3.1.3 Hypothesis test

The coefficient of determination or R square shows the variation or change in the dependent variable caused by the independent variable, or is used to determine the magnitude of the influence of the independent variable on the dependent variable or it can also be said to estimate the proportion of variance explained by the accounting policy variable. The R² value ranges from 0 to 1. The R² value that is closer to 1 indicates that the influence of the independent variable on the dependent variable is getting stronger. Conversely, the closer to 0 indicates the weaker the influence.

Table 2. Coefficient of Determination Test Results

<i>Regression Statistics</i>	
Multiple R	0.685702597
R Square	0.470188051
Adjusted R Square	0.417206856
Standard Error	0.345264664
Observations	12

The coefficient of determination test results state that the R Square value in the table above is 0.47. This shows that the food security budget variable can be explained by the accounting policy variable by 47% while the remaining 53% is explained or described by other independent variables which are not included in this research model.

Table 3. Regression Results (ANOVA)

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	1.057923115	1.057923115	8.874621492	0.0138306
Residual	10	1.192076885	0.119207689		
Total	11	2,25			

Linear regression analysis was carried out to determine the influence of the independent variable on the dependent variable. The magnitude of this influence can be seen in Table 3. The criteria for hypothesis testing using f statistics are that if the significant value of $f < 0.05$, then the alternative hypothesis is accepted, which states that the independent variable influences the dependent variable significantly. At a significance level < 0.05 obtained f-

table = 4.67. Based on the results of the *f* test in the table above, the *f* value is 8.87, which is greater than the *f*-table of 4.67 with a significance level of 0.0138, more than <0.05 , so the accounting policy variable (X) has a significant effect on the food security budget (Y).

3.2 Discussion

Changes in accounting policy from initially based on a cash basis then in the transition period we became familiar with the cash towards accrual system until the enactment of PP 71 of 2010 concerning government accounting standards with an accrual basis where implementation was no later than 2015, we can see that to find a pattern of budgeting and financial reporting A country is not a project that can be completed in a short time. It took years for the Indonesian government to find an accounting system that suited the characteristics of state budget management.

The statistical test results presented previously found that the transformation of government accounting policies can influence budget-setting patterns, especially for food security. The issue of food security becomes important when it is linked to accounting policies and to support SDGs programs. Apart from being a national priority program, accounting policy forces users of established standards to follow the provisions brought by new accounting standards.

The accrual basis presents information related to cash and additional information as a whole. This accounting policy also accommodates the management of non-financial assets. The accrual basis also provides readable and simpler information to assess the financial performance of the agency.

In terms of the food security budget, the government allocates it not only to the central government but the food security budget is spread across a number of ministries such as the Ministry of Agriculture, the Ministry of Marine Affairs and Fisheries, the Ministry of Social Affairs, through a special allocation fund mechanism to the regions and so on. The food security budget is also intended to support sustainable development goals where the main objectives are to end hunger, achieve food security and improved nutrition and promote sustainable agriculture. To ensure the allocation of the budget from the central government to the regional government, an accounting policy is needed that can make all stakeholders in transparent and accountable mode.

The transparency required in this new accounting policy can make budget users more open and honest to the public regarding government accountability in managing the resources entrusted to them and their compliance with laws and regulations. Accrual-based government accounting standards also help users evaluate the implementation of reporting entity activities in a certain reporting period so that it can facilitate the planning process in the following period. In other words, accounting policy reform can make use of the food security budget presented openly. As a result, users of financial reports can assess whether the food security budget has been used appropriately or not. Furthermore, users of government financial reports can also assess whether the government's food security budget has supported the SDGs program or not.

The results of statistical tests show that the transition from government accounting standards to an accrual basis has had a significant impact on the food security budget allocation in Indonesia. The initial spike in budgets following the implementation of the accrual basis indicates that new accounting practices allowed for better visibility and management of financial resources, thereby leading to increased budget allocations. However, subsequent budget fluctuations highlight the need for ongoing monitoring and evaluation to ensure that budget allocations effectively meet food security goals.

The positive correlation and significant *F* test results underline the importance of transparent and accurate financial reporting in public sector budgeting. Accrual-based

accounting provides a more comprehensive view of the government's financial position, which is critical for effective policy-making and resource allocation, especially in important sectors such as food security.

Fluctuations in Indonesia's food security budget from 2011 to 2023 as depicted in the graph can be caused by several factors. These fluctuations reflect complex interactions between various economic, political and policy elements. The following are some possible causes of budget fluctuations:

3.2.1. Policy changes and implementation stages

Policy changes and implementation stages namely: (1) Transition to accrual basis, transition to accrual basis accounting requires significant adjustments in financial reporting and management practices. The initial budget spike in 2015 and 2016 likely reflects the government's efforts to align with new accounting standards and increase financial transparency and accountability [10]. (2) Implementation challenges, the budget decrease from 2017 to 2020 may be due to challenges in implementing the accrual basis at all levels of government. These challenges may include the need for training, improving systems, and overcoming resistance to change. (3) Economic conditions, global and Domestic Economic Trends: Economic downturns or growth can have a significant impact on government revenues and expenditures [11]. For example, a global economic slowdown or recession can lead to reduced government revenues, requiring budget cuts in various sectors, including food security. (4) Inflation and currency fluctuations, inflationary pressures and currency fluctuations can affect the purchasing power of the allocated budget, thereby causing adjustments to the nominal budget figures.

3.2.2. Political and administrative factors

The political and administrative factors are: (1) Government priorities, changes in government administration and shifts in policy priorities can cause fluctuations in budget allocations. Different governments may place varying degrees of emphasis on food security compared to other policy areas; (2) Legislative approval, the budget approval process involves negotiation and approval by the legislative body, which may make changes and adjustments to the initially proposed budget.

3.2.3. External shocks and natural disasters

Indonesia is prone to natural disasters such as earthquakes, floods and volcanic eruptions. These events can disrupt agricultural production and infrastructure, requiring budget reallocation to meet emergency needs and reconstruction efforts. Events such as global pandemics (e.g., COVID-19) can strain government resources and cause reallocation to address urgent health and economic challenges [12], thereby impacting food security budgets.

3.2.4. Agricultural productivity and food prices

Variations in agricultural productivity due to weather conditions, pests and diseases can affect food security budgets. Lower agricultural output may require increased budget allocations to support food imports or subsidies. Fluctuations in global and domestic food prices can impact the costs of food security programs, resulting in budget adjustments to ensure food availability and affordability.

3.2.5. Program efficiency and effectiveness

The effectiveness and efficiency of food security programs can influence budget allocations. Programs that demonstrate high impact and efficiency may receive increased funding, while programs with limited success may experience budget cuts or restructuring. Monitoring and Evaluation: Continuous monitoring and evaluation of food security programs can result in budget adjustments based on performance results and identified gaps.

4 Conclusion

The change in accounting policy from a cash basis to an accrual basis in Indonesia has had a significant impact on food security budget allocations. The results of this research show a significant increase in the food security budget during the transition to a full accrual basis in 2015, reaching a peak in 2016. Although there were fluctuations after that year, the budget increased again from 2021 to 2023.

Accrual-based accounting policies have been proven to have a significant effect on the food security budget, meaning that changing government accounting standards to an accrual basis can increase financial transparency and accountability. To support the SDGs mission, accounting policy reform is needed because it can affect the food security budget. Accrual basis accounting policy allows financial reports to be presented in a transparent and accountable manner so that it can encourage continuous monitoring and evaluation of the use of the food security budget to ensure the budget effectively achieves national food security.

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