



UNDERSTANDING THE ROLE OF RELEVANT INCOME-GENERATION PROJECTS IN BUDGET DEFICIT FINANCING: INSIGHTS FROM A MIXED-METHODS STUDY IN TANZANIA'S PUBLIC UNIVERSITIES

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Abstract:

Revenue-generating initiatives have become essential mechanisms for strengthening the financial sustainability of public universities and reducing dependence on government and donor funding. This study examined the effect of relevant Income Generation Projects (IGPs) on budget deficit financing in Tanzanian public universities using an explanatory sequential mixed-methods design underpinned by pragmatic philosophy. The target population comprised 4,523 individuals, from which 303 respondents were selected through simple random and purposive sampling. Quantitative data were collected through structured questionnaires and analyzed using hierarchical multiple linear regression, while qualitative data from interviews were thematically analyzed to expand and validate the quantitative findings. In Step 1, institutional characteristics (university age and size) were entered and produced a statistically significant baseline model ($R^2 = 0.104$). In Step 2, the main predictor; relevance of IGPs was introduced, resulting in a substantial increase in explanatory power, with the full model accounting for 63.4% of the variance in budget deficit financing ($R^2 = 0.634$). The R^2 change of 0.530 indicated that the relevance of IGPs contributed significantly to explaining additional variance beyond the control variables. Regression results confirmed a significant positive effect between relevance of IGPs and budget deficit financing ($B = 0.108$, $\beta = 0.123$, $t = 3.022$, $p < .05$). Qualitative findings supported these results, showing that IGPs aligned with institutional missions and community needs yield stronger financial returns. However, respondents also highlighted that the positive impact of relevant IGPs is often undermined by ineffective management, unmet operational benchmarks, and

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inconsistent project performance. The study concludes that relevance of IGPs is a significant predictor of budget deficit financing, but its effectiveness is constrained by managerial weaknesses. It recommends introducing leadership and financial management training for individuals overseeing IGPs to maximize their contribution to budget deficit financing and enhance long-term financial sustainability within public universities.

JEL: I22 – Educational Finance, Financial Aid; H52 – Government Expenditures and Education; H61 – Budget, Budget Systems; L31 – Nonprofit Institutions, NGOs; Social Enterprises; M21 – Business Economics, Management

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1. Introduction

Public universities across the globe are increasingly confronted with financial constraints stemming from declining government subsidies, rising operational costs, and expanding student populations. In Tanzania, these challenges are particularly acute, as public universities grapple with budget deficits that threaten their ability to deliver quality education, sustain research output, and maintain infrastructure (Mgejwa *et al.*, 2025).

Historically, higher education institutions have relied heavily on government funding and donor contributions to finance their core functions. However, this model has proven unsustainable in the face of macroeconomic volatility and shifting policy priorities. As a result, universities have been compelled to explore alternative revenue streams, notably through Income Generation Projects (IGPs), which encompass a wide array of commercial and service-oriented ventures such as consultancy services, facility rentals, agricultural enterprises, and training programs (Mahmud *et al.*, 2022).

The strategic relevance of IGPs lies in their potential to supplement institutional budgets while aligning with academic and community development goals. Studies from Kenya and Indonesia have shown that well-managed IGPs not only enhance liquidity and financial autonomy but also foster innovation and stakeholder engagement (Mbugua *et al.*, 2024; Mahmud *et al.*, 2022). In Tanzania, the adoption of IGPs has gained momentum, with universities increasingly integrating these initiatives into their financial planning frameworks. However, the effectiveness of IGPs in addressing budget deficits remains contingent upon their relevance, sustainability, and managerial competence (Mgejwa *et al.*, 2025).

The theoretical underpinning of this shift can be traced to Resource Dependency Theory, which posits that organizations must diversify their income sources to mitigate external control and enhance strategic autonomy (Archibald, 2017). Within the Tanzanian context, the relevance of IGPs is not merely a financial imperative but a strategic necessity. When aligned with institutional missions and community needs, IGPs can

serve as resilient financial instruments capable of bridging funding gaps and supporting long-term development (Delmonte, 2021; Davis & Miller, 2016).

Nonetheless, empirical evidence suggests that the success of IGPs is often undermined by poor governance, lack of financial literacy among project managers, and inadequate performance monitoring (Montemayor, 2024). These operational challenges highlight the need for capacity-building interventions, particularly in financial leadership and project management, to ensure that IGPs fulfill their intended role in deficit financing. This study, therefore, investigated the effect of relevant IGPs on financing budget deficits in Tanzanian public universities, contributing to the growing discourse on financial sustainability in higher education and offering actionable insights for institutional reform.

2. Literature Review

Public universities across the globe are increasingly turning to Income Generation Projects (IGPs) as a strategic response to declining government funding and rising operational costs. Mahmud, Nuryatin, and Susilowati (2022) conducted a qualitative case study at an Indonesian public university, using document analysis and interviews with administrators. Their findings revealed that IGPs significantly bolstered institutional budgets, enabling improvements in infrastructure and staffing. However, the study also uncovered weaknesses in financial reporting and stakeholder engagement, which posed risks to long-term sustainability. A critical limitation of their work was the absence of a formal evaluation framework to assess how well these projects aligned with the university's strategic objectives. In Malaysia, Ahmad *et al.* (2015) employed a mixed-methods approach surveying academic staff and conducting focus group discussions to explore their involvement in income-generating activities such as consultancy and research commercialization. The study found that institutional autonomy, entrepreneurial culture, and incentive structures were key motivators for staff participation. Nonetheless, the reliance on self-reported data introduced potential bias, and the study did not empirically quantify the financial impact of these activities on university budgets. This limits its utility for policy formulation aimed at enhancing fiscal sustainability. Marcos (2024) investigated best practices in IGP management across several State Universities and Colleges (SUCs) in the Philippines through a multi-case study design. Drawing on document reviews and key informant interviews, the study identified transparent procurement systems, strategic alignment with institutional missions, and robust monitoring frameworks as essential for successful IGP implementation. While the findings offer valuable insights into governance, the study's qualitative nature restricts generalizability. Moreover, it lacked quantitative metrics to assess the scale of budgetary impact, making it more descriptive than predictive.

Tolbe (2020) conducted a quantitative survey involving 15 public universities in Ghana to examine the relationship between financial management practices and IGP outcomes. Using regression analysis, the study demonstrated that institutions with

strong governance structures achieved better results in employment creation, infrastructure development, and revenue generation. Although methodologically sound, the study narrowly focused on financial metrics and did not consider the strategic or educational relevance of IGPs. This omission weakens its applicability to broader institutional planning and policy integration.

In Tanzania, Mwaitete (2024) evaluated the Higher Education for Economic Transformation (HEET) initiative using a mixed-methods approach that combined surveys, interviews, and project audits. The study found that well-managed IGPs under HEET not only supplemented university budgets but also addressed youth unemployment through vocational training and job creation. It emphasized the importance of aligning IGPs with national development goals and institutional strategic plans. However, the study lacked rigorous econometric analysis to isolate the financial contribution of relevant IGPs to deficit financing, limiting its explanatory depth.

While existing studies have explored the economic benefits and management practices of IGPs in various contexts, there is limited empirical evidence on the specific contribution of relevant IGPs that are aligned with institutional goals and community needs to budget deficit financing in Tanzanian public universities. Most research has focused on general income generation or social impact, with insufficient attention to the strategic relevance of IGPs and their alignment with institutional priorities. This study addressed that gap by empirically examining the effect of relevant IGPs on budget deficit financing using a mixed-methods approach. It aimed to capture both statistical relationships and qualitative insights from respondents, offering policy recommendations for enhancing IGP performance through leadership training in financial management. By doing so, the study contributed to the discourse on financial sustainability in higher education and provided actionable strategies for Tanzanian universities navigating fiscal constraints.

3. Methodology

Using a pragmatic research philosophy and abductive approach, the study employed an explanatory sequential design in Tanzanian public universities, specifically the University of Dar es Salaam, the Open University of Tanzania, Mzumbe University, Sokoine University of Agriculture, and the State University of Zanzibar. Random sampling selected 339 respondents, which was later reduced to 303 respondents after data screening, and data were collected using tailored 5-point Likert scale questionnaires and an interview guide. To ensure the reliability and validity of the instruments, a pilot study was conducted at the Open University of Tanzania involving 15 respondents who were not included in the main study, focusing on the questionnaire designed to assess the effect of relevant income-generation projects on financing budget deficits in public universities. The internal reliability coefficients for the pilot result were 0.779 for the six items measuring the relevance of IGPs, exceeding the 0.70 threshold recommended for Cronbach's Alpha (Meehl, 2010). This is shown in Table 1.

Table 1: Reliability Coefficients for All Items During Pilot Study

Items for Relevance	Cronbach's Alpha if Item Deleted
The adopted IGPs support the budget deficit financing because they are designed to solve budget deficits	.724
The design of the adopted IGPs supports the aim of solving budget deficits in public universities	.716
The context in which the adopted IGPs are operating is relevant to the aim of IGPs of financing budget deficits in public universities, as it enables IGPs to generate more revenue	.761
The human resources operating the adopted IGPs is relevant, and it has helped to achieve the goal of IGPs in financing budget deficits in public universities	.754
The current adopted IGPs are relevant to the goal of financing budget deficits because it generate income that is enough to meet the main goal	.809
The current adopted IGPs are relevant because their operating cost is low, which has brought room for more revenue generation, which has helped to reduce the budget deficits in public universities	.690
Overall Reliability (Cronbach Alpha)	.779

Source: Survey Data (2025).

Table 2 shows the reliability of the items during the main study. The findings show that the relevance of IGPs had a Cronbach's Alpha greater than or equal to 0.7, showing that the items for relevance of IGPs were reliable (Salleh, Sulaiman, & Gloeckner, 2023).

Table 2: Reliability for the Items Retained During the Main Study After EFA in the Main Study

Factor	No. of items per factor	No. of Items Retained	Cronbach's Alpha
Relevance of IGPs	06	05	.749
Total/Overall	06	05	

Source: Survey Data (2025).

Weyant (2022) outlined four criteria for qualitative research reliability: credibility, transferability, dependability, and confirmability. This study ensured credibility through participant validation, transferability via detailed findings, and dependability using an expert audit. Confirmability was achieved through data verification, coding frameworks, triangulation, member checking, and reflexivity, which helped address potential biases and ensure replicability of the findings.

3.1 Data Analysis

Data analysis was conducted in two stages: quantitative data were analyzed first, followed by qualitative data analysis. The interpretation order began with reporting quantitative findings, developing or designing features to be tested (such as instruments or new qualitative measures), and then conducting qualitative testing in the final phase of the study. Since the two datasets were drawn from different samples, no direct comparison was made; rather, the strategy aimed to determine whether qualitative

themes identified in the second phase could be generalized to a larger population (Creswell, 2018).

3.2 Quantitative Data Analysis

The analysis began with an Exploratory Factor Analysis (EFA) on the independent variable, the relevance of IGPs, which comprised six items. The EFA was conducted using the Varimax rotation method with Kaiser Normalization to identify the underlying structure of the data, maximize variance of squared loadings, and simplify interpretation. With a sample of 303 respondents, the study satisfied the recommended minimum of more than 250 respondents, ensuring adequate statistical power. A 95% significance level and 80% power were applied, and items were retained based on factor loadings ≥ 0.35 , as recommended by Hair *et al.* (2019). Two items were removed due to cross-loading. To further examine the relationship, a hierarchical multiple linear regression (HMLR) analysis was employed to assess the impact of the relevance of income-generation projects on financing budget deficits in Tanzanian public universities while controlling for covariates.

Table 3: Factors Extracted after EFA for Relevance of IGPs

Item Statements on Relevance of IGPs	Code	Factor Loading
The adopted IGPs support the budget deficit financing because they are designed to solve budget deficits	IVRelevance1	.763
The human resources operating the adopted IGPs is relevant, and it has helped to achieve the goal of IGPs in financing budget deficits in public universities	IVRelevance4	.726
The context in which the adopted IGPs are operating is relevant to the aim of IGPs of financing budget deficits in public universities, as it enables IGPs to generate more revenue	IVRelevance3	.724
The current adopted IGPs are relevant because their operating cost is low, which has brought room for more revenue generation, which has helped to reduce the budget deficits in public universities	IVRelevance6	.661
Eigen Value		1.483
Percentage of Variance		11.404
Cumulative Percentage of Variance		42.924

Source: Survey Data (2025).

3.3 Qualitative Data Analysis

For qualitative data, a thematic analysis was conducted to explore respondents' perceptions regarding the relevance of income-generating projects (IGPs) in financing budget deficits in public universities. The analysis involved identifying key themes and discussing them in detail, while systematically linking the qualitative to the quantitative findings. This transition from the quantitative to the qualitative phase was necessary in order to provide deeper explanations and contextual understanding of the statistical results obtained earlier.

4. Results

4.1 Respondents' Demographic Information

The study examined the demographic and institutional characteristics of respondents from Tanzanian public universities. Slightly more female participants (51.8%) were represented compared to males (48.2%). The majority (60.7%) were aged between 36 and 53 years, indicating active engagement in the workforce during their most productive years. In terms of educational attainment, most respondents (57.1%) held master's degrees, reflecting their strong academic and professional orientation. Institutionally, older universities accounted for 72.9% of the responses, demonstrating the advantage of established structures that support the implementation of income-generating projects. Additionally, large universities with student populations exceeding 11,000 constituted 73.6% of the sample, underscoring both their operational scale and associated financial challenges. Overall, these findings provide important insights into demographic composition, workforce trends, and institutional frameworks that are central to the effective implementation of income-generating projects in Tanzanian public universities.

Table 4: Respondents' Demographic Information

Category	Details	Frequency	Percent (%)
Gender	Female	157	51.8
	Male	146	48.2
Age	18-35 years old	61	20.2
	36-53 years old	184	60.7
	54 years and above	58	19.1
	Total	303	100
Education Level	Diploma	11	3.6
	Bachelor's Degree	58	19.1
	Master's Degree	173	57.1
	PhD	61	20.2
	Total	303	100
University's Age	16-25 years	82	27.1
	26 years and above	221	72.9
University Size	1,000-5,000 students	3	0.99
	6,000-10,000 students	77	25.41
	11,000 students and above	223	73.6
	Total	303	100

Source: Survey Data (2025).

4.2 Mean, Standard Deviation and Correlations Between Variables

Before inferential analysis, descriptive statistics were examined to provide insights into the variables under study. Table 5 presents the mean and standard deviation for budget deficit financing and the relevance of income-generation projects. The findings indicate that the mean score for budget deficit financing was 3.36, with a standard deviation of 0.80. This result shows that respondents generally perceived income-generation projects as contributing positively to financing budget deficits, although their views varied

considerably. Similarly, the mean score for the relevance of income-generation projects was 3.46, with a standard deviation of 0.76. This suggests that respondents regarded the projects as relevant to addressing universities' financial challenges, though perceptions also varied moderately.

Table 5: Descriptive Statistics

Study Variables	Mean	Std. Deviation
Budget Deficit Financing	3.3616	0.80196
Relevance of Income-Generation Projects	3.4578	0.76210

Source: Survey Data (2025).

The correlation analysis in Table 4.20 further revealed a statistically significant positive relationship between budget deficit financing and the relevance of income-generation projects ($r = 0.440$, $p < 0.05$). This implies that as the perceived relevance of income-generation projects increases, the capacity of universities to finance budget deficits also improves. Although the strength of the relationship is moderate, it highlights that relevance is an important factor in enhancing the performance of income-generation projects in reducing budget deficits in Tanzanian public universities.

**Table 5: Correlation Between Budget Deficit Financing
and Relevance of Income-Generation Projects**

Variables	N	1	2
1. Budget Deficit Financing	303	1.000	
2. Relevance of IGPs	303	0.440**	1.000

*Notes: $*p \leq 0.05$,

Source: Survey Data (2025).

The findings suggested that the more relevant the income-generation projects are perceived to be, the greater their contribution to financing budget deficits in public universities. This indicates that ensuring alignment between the projects and institutional needs is crucial. Universities should therefore focus on designing income-generation projects that directly respond to financial and operational demands, as this would strengthen their role in mitigating budgetary shortfalls.

4.3 The Relevance of Income-Generation Projects on Financing Budget Deficits in Public Universities in Tanzania, Controlling for Covariates

A hierarchical multiple linear regression analysis was conducted to assess the effect of the relevance of income-generation projects (IGPs) on budget deficit financing in Tanzanian public universities. The analysis proceeded in two steps to examine both the contribution of the control variables and the unique effect of relevance when added to the model.

Step 1: Control Variables

In the first step of the hierarchical model, only the control variables, university age and university size were entered into the regression equation. The findings indicated that university age did not significantly predict budget deficit financing ($\beta = 0.098$, $p = 0.206$), suggesting that the number of years a university has been in operation does not independently account for differences in financial performance at this stage. In contrast, university size emerged as a significant predictor ($\beta = 0.245$, $p = 0.002$). This implies that universities with larger student populations demonstrate a relatively stronger capacity to finance their budget deficits compared to smaller institutions.

The initial model explained 10.4% of the variance in budget deficit financing ($R^2 = 0.104$, adjusted $R^2 = 0.098$), and the overall regression was statistically significant, $F(2, 300) = 17.354$, $p < 0.001$. These results indicate that the covariates collectively make a meaningful contribution to variations in how public universities manage budget deficits, although the explanatory power of this first model remains modest.

Step 2: Main Independent Variable Added

In the second step, the relevance of IGPs was introduced alongside the control variables. The inclusion of this variable substantially improved the explanatory capacity of the model. The results showed that relevance had a statistically significant effect on budget deficit financing ($\beta = 0.123$, $p = 0.003$), demonstrating that universities with projects perceived as more relevant to their institutional priorities and operational needs tend to perform better in addressing budget deficits. Notably, university age became a significant predictor in this step ($\beta = 0.130$, $p = 0.010$), indicating that once relevance is controlled, older institutions exhibit enhanced financial capacity, possibly due to accumulated managerial experience or long-term strategic planning.

Conversely, university size became non-significant ($\beta = 0.031$, $p = 0.546$), suggesting that the effect observed in Step 1 was overshadowed by the stronger, more strategic influence of relevance. This shifting significance highlights that structural characteristics such as size matter less in the presence of well-aligned and strategically designed IGPs.

The full model explained 63.4% of the variance in budget deficit financing ($R^2 = 0.634$, adjusted $R^2 = 0.628$), reflecting a major improvement over the first model. The overall regression remained statistically significant, $F(5, 297) = 102.832$, $p < 0.001$, confirming that relevance is a key determinant when institutional factors are considered.

Table 4.3: Coefficients for the Hierarchical Regression Model

Predictor	B	Std. Error	Beta	t	p
(Constant)	0.053	0.229	—	0.233	0.816
University Age	0.205	0.079	0.130	2.581	0.010
University Size	0.046	0.076	0.031	0.604	0.546
Relevance of IGPs	0.108	0.036	0.123	3.022	0.003

Note: Dependent Variable: Budget Deficit Financing in Public Universities

The null hypothesis stated that there is no significant relationship between the relevance of IGPs and budget deficit financing, controlling for covariates. Based on the significance of relevance ($\beta = 0.123$, $p = 0.003$), the null hypothesis is rejected. This provides evidence that relevance has a measurable and positive influence on financial performance in public universities even after accounting for university size and age.

The results of the hierarchical regression suggest that the relevance of income-generation projects plays an important role in determining how effectively public universities in Tanzania finance their budget deficits. The positive coefficient associated with relevance indicates that universities with IGPs aligned to their core mandates, strategic objectives, and operational needs tend to experience stronger financial benefits from these initiatives. In practical terms, a one-unit increase in the perceived relevance of IGPs leads to a 0.108-unit increase in budget deficit financing, underscoring the value of strategic alignment.

These findings mirror global research trends, which emphasize that financial success in income-generating activities depends on how well such projects align with institutional priorities. Studies in Indonesia (Mahmud *et al.*, 2022) have shown that when projects respond directly to institutional needs and stakeholder expectations, they generate stronger financial outcomes. Similar conclusions were reported in Malaysian public universities (Ahmad *et al.*, 2015), where relevance was a primary determinant of participation and project success. In the Tanzanian context, evidence from the HEET initiative (Mwaitete, 2024) further confirms that universities with strategically aligned and relevant IGPs achieve not only financial gains but also improved academic and socio-economic outputs.

The shift in significance among the covariates across the two steps provides additional insight. While university size initially appeared to play a role, its influence diminished when relevance was introduced, indicating that financial success depends more on the strategic nature of the projects rather than the scale of the institution. The emergence of university age as a significant predictor in the full model suggests that institutional maturity may facilitate better planning, governance, and execution of relevant projects, leading to improved financial outcomes.

Generally, the findings emphasize that public universities should prioritize the strategic relevance of their IGPs to optimize financial sustainability and effectively address budget deficits.

4.4 Transition to the Qualitative Phase

To further explore the observed positive relationship between the relevance of income-generation projects (IGPs) and financing of budget deficits, qualitative data were analyzed. While the quantitative results indicated that the relevance of IGPs significantly contributes to budget deficit financing, they did not provide insight into how or why this relationship occurred. Building on these findings, interviews were conducted with key university administrators and staff to gain a deeper understanding of the contextual and operational factors that shape the perceived relevance of IGPs. This qualitative phase

aimed to explain the patterns identified in the regression analysis, providing a richer, more understandable interpretation of how relevant projects are selected, managed, and aligned with institutional priorities to enhance financial sustainability in Tanzanian public universities.

4.4.1 The Perceptions and Experiences of University Stakeholders About the Significant Relevance of IGPs in Financing Budget Deficits in Public Universities in Tanzania.

In the quantitative phase, relevance was found to be a significant factor that makes IGPs successful in financing budget deficits in public universities ($\beta=0.108$, $p < 0.05$). In the qualitative phase, the study explored more through interviews about the perceptions of the respondents on the relevance of income generation projects (IGPs) in financing budget deficits in public universities. The experiences provided were organized into three key themes, including alignment with budget deficit financing, extent of contribution, and proportion financed. The findings provided a comprehensive understanding of why IGPs were perceived as significant in addressing budgetary challenges during the quantitative phase.

Theme 1: Alignment with Budget Deficit Financing

Respondents consistently emphasized that IGPs are well-aligned with efforts to reduce budget deficits. Their insights showed that IGPs in their universities were designed to address existing financial gaps while simultaneously supporting the objectives of the universities.

As one academic staff member articulated,

"The relevance of these projects is clear; they directly address our pressing funding needs." (Mkato, Interview, AS1).

Another respondent noted,

"Income generation projects are a lifeline for the university; without them, our operations would be severely impacted." (Jum, Interview, AS2).

Additionally, one administrator remarked,

"These projects resonate strongly with our financial objectives, bridging the gap between the ideal budget and actual funds available." (Mwansa, Interview, UA2).

This alignment is crucial for reinforcing the significance and viability of these institutions. As one University administrator remarked,

"Our initiatives are closely aligned with the university's mission to improve educational standards and foster research, which is why they maintain their relevance and sustainability." (Mkwaju, Interview, UA1)

This quote from the respondent highlighted the crucial connection between IGPs and universities' fundamental objectives, illustrating how these initiatives not only alleviate budget deficits but also foster research advancements in public universities. In higher education, income-generation projects (IGPs) are essential for supporting the strategic goals of universities and ensuring their sustainability and relevance.

Another respondent said,

"Income-generation projects extend beyond just financial profits; they are essential for connecting our educational initiatives with the needs of the community, which validates their importance." (Nwosu, Interview, UA2)

This statement emphasized that the value of IGPs goes far beyond generating revenue. It indicates that these projects play a vital role in aligning the goals of universities with community expectations, thus ensuring their relevance and supporting the overall mission of the institution. In justifying this theme, another university administrator said,

"Although some initiatives may not demonstrate immediate results, their contribution to the university's financial well-being over time is unmistakable. They are vital for addressing budgetary challenges." (Kabanga, Interview, UA3)

The respondent acknowledged that certain IGPs may lack immediate effectiveness but pointed out their long-term financial benefits. This perspective highlighted the necessity of maintaining these projects, suggesting they are crucial assets in managing the financial landscape of public universities, regardless of short-term performance.

Another respondent had this to say,

"In essence, IGPs not only fill financial voids but also advance our commitment to academic excellence and research initiatives." (Menza, Interview, UA4)

This observation summarized the dual role of IGPs as both financial solutions and drivers of academic progress. It illustrates how these projects not only help alleviate budget deficits but also contribute to fostering an environment that promotes educational quality and research advancements, reinforcing their importance in the public university context.

The qualitative insights insisted that such alignment is vital, as it emphasizes how IGPs contribute directly to enhancing both educational standards and research capabilities by reducing the budget deficit in public universities. This connection is

crucial because it illustrates that without aligning these projects with the university's core mission, their impact may be limited or short-lived on budget deficit financing.

In the quantitative analysis, the significance of sustainability and relevance emerged as key factors determining the performance of these initiatives. Data revealed that IGPs that align with institutional goals demonstrate higher levels of support and funding, indicating that stakeholders are more willing to invest in projects that are perceived as beneficial to the university's mission. According to Mkwaju (UA1), the alignment between the IGPs and financing budget deficits in public universities secures necessary resources and fosters a sense of community and purpose among faculty, staff, and students involved in these initiatives.

Furthermore, the respondents' insights continued to insist on the significance of stakeholder involvement in the success and sustainability of income-generating projects (IGPs) at the university. Respondents emphasized that active participation from both faculty and community members is crucial for aligning projects with local needs and securing ongoing support.

One respondent, an accountant at the university, noted,

"When the community collaborates with us in the planning stages, it creates a sense of ownership and trust, which is essential for long-term financial sustainability." (Alex, Interview, UAc1)

Additionally, an academic staff member emphasized the impact of this involvement, stating,

"Engaging faculty and community members ensures our projects are relevant and supported, leading to a greater likelihood of continued financial backing." (Jamie, Interview, FM5)

Theme 2: Extent of Contribution

Some respondents highlighted the noticeable contribution that IGPs make toward financial stability in public universities. They perceived IGPs as critical tools to alleviate financial strain, even though they acknowledged that such projects do not completely resolve all budgetary challenges. One respondent commented,

"Without IGPs, the financial strain would be unbearable, though they don't cover everything." (Suju, Interview, Acc3).

Another participant observed,

"Their contribution is significant; they allow the university to maintain essential services even during tough times." (Nasri, Interview, AS3)

Similarly, a financial officer stated,

"The projects have become indispensable. They may not cover everything, but they offer relief where government funding falls short." (Kida, Interview, Acc2).

These findings indicated that IGPs serve as an essential financial mechanism to mitigate financial instability in public universities in Tanzania, despite their limitations.

Theme 3: Proportion Financed

Interviews revealed that a significant proportion of budget deficits is financed through IGPs, particularly those that are integrated into academic or community-focused initiatives. This reinforced the IGP's perceived relevance as a means to bridge the gap between limited government funding and the actual financial needs of public universities in Tanzania. One university administrator explained,

"Relevance lies in their ability to bridge gaps between limited government funding and actual needs." (Katu, Interview, UA1)

Another respondent said,

"These projects contribute a substantial portion of our funding, especially in departments that generate income through partnerships and outreach programs." (ZayB, Interview, Acc4)

Additionally, one faculty member shared,

"The integration of income generation into academic programs has strengthened their impact, providing both financial and institutional benefits." (Makiri, Interview, AS4)

The findings of this study insist on the significant role that Income Generation Projects (IGPs) play in financing budget deficits in Tanzanian public universities. Respondents emphasized that IGPs are not only financial instruments but also strategic tools that align with institutional missions of teaching, research, and community service. This sense of alignment was repeatedly highlighted in the interviews, where stakeholders described IGPs as initiatives that directly address funding gaps while simultaneously contributing to academic and research advancement. Such perceptions echo the work of Marcos (2024), who found that strategic alignment with institutional missions was a critical factor for successful IGP implementation in Philippine universities. Similarly, Mahmud, Nuryatin, and Susilowati (2022) reported that Indonesian universities benefitted from IGPs through improvements in infrastructure and staffing, although their study identified weaknesses in financial reporting and the absence of a clear evaluation framework. In addition, Kinyua (2021) found that Kenyan universities that

strategically aligned their income projects with academic programs recorded stronger institutional ownership and financial sustainability. Compared to these contexts, the Tanzanian findings reveal that alignment is perceived not only as a managerial concern but also as an essential condition for sustainability and stakeholder trust.

The extent of IGPs' contribution to financial stability was another recurrent theme. Respondents acknowledged that while IGPs do not completely close the funding gap, they provide a critical cushion that allows universities to sustain essential services and operations. This finding is consistent with Ahmad *et al.* (2015), who found that Malaysian universities relied on staff participation in consultancy and commercialization activities as supplementary sources of income. However, whereas Ahmad *et al.* emphasized institutional autonomy and incentive structures as the drivers of staff involvement, the Tanzanian stakeholders stressed the importance of faculty and community participation in shaping and sustaining IGPs. Their insights suggest that financial contribution alone is insufficient for long-term impact unless it is backed by inclusive governance and a strong sense of ownership among stakeholders. Similar arguments were raised by Mwirigi and Kariuki (2020) in Kenya, who demonstrated that inclusiveness and shared responsibility were crucial in sustaining income-generation ventures in public universities.

The interviews further revealed that a considerable proportion of budget deficits in Tanzanian public universities is financed through IGPs, particularly when these initiatives are integrated with academic programs and community outreach. This integration strengthens not only financial stability but also institutional relevance, as projects generate both income and educational benefits. These findings complement Tolbe's (2020) study in Ghana, which showed that universities with strong governance and financial management practices achieved higher levels of revenue and infrastructure development. However, while Tolbe's study focused narrowly on financial outcomes, the present study highlights the broader strategic and educational value of IGPs. This dual role demonstrates that IGPs are not merely about raising funds but are also vehicles for reinforcing the academic and social missions of universities. This position is further supported by Mugisha (2019), who established that Ugandan universities with integrated academic-income projects were more resilient to funding shocks compared to those that treated IGPs as stand-alone financial enterprises.

Governance, transparency, and sustainability emerged as cross-cutting concerns in both this study and the reviewed literature. Marcos (2024) emphasized transparent procurement systems and robust monitoring frameworks as essential for successful IGP implementation, while Mahmud *et al.* (2022) warned that weak financial reporting and stakeholder engagement jeopardized sustainability in Indonesia. The Tanzanian findings resonate with these concerns but extend the discussion by underscoring the importance of faculty and community involvement in project planning and execution. Such participation fosters ownership, legitimacy, and ongoing support, ensuring that IGPs remain relevant and sustainable.

Taken together, these findings contribute to the broader empirical debate on IGPs in public universities. While earlier studies tended to focus separately on financial, managerial, or cultural aspects, this study integrates these dimensions by showing how alignment, contribution, and proportion financed interact in a context of declining government funding. Moreover, it addresses gaps in prior research, such as Ahmad *et al.* (2015) and Tolbe (2020), which did not adequately capture the strategic and educational relevance of IGPs. By emphasizing both financial and institutional missions, the Tanzanian experience demonstrates that the sustainability of IGPs lies not only in revenue generation but also in their ability to advance the core objectives of higher education. The integration of these projects into broader institutional initiatives further enhanced their contribution to addressing budgetary deficits in public universities.

The integration of the quantitative and qualitative findings provided a complete understanding of the role of income-generation projects (IGPs) in addressing budget deficits in public universities in Tanzania. The quantitative analysis showed a significant relationship between the relevance of IGPs and budget deficit financing. The results indicated that a one-unit change in the relevance of IGPs led to a 0.108 increase in budget deficit financing, which was statistically significant ($\beta=0.108$, $p < 0.05$). This explained that the more relevant the IGPs were, the more they contributed to reducing financial shortfalls in these universities.

The qualitative findings gave a deeper understanding of why IGPs were seen as important. Respondents explained that these projects were closely aligned with the financial needs and goals of the universities. Many participants emphasized that IGPs not only filled funding gaps but also supported broader institutional missions, such as improving education and fostering research. For example, one university administrator mentioned that these projects bridged the gap between ideal budgets and actual resources, helping the universities remain sustainable.

By combining the two approaches, the study offered a clearer picture. The quantitative data showed the extent of the financial contribution, while the qualitative data explained how and why these projects worked. Themes like alignment with financial goals and stakeholder involvement played a key role in making IGPs successful. Respondents shared that having faculty and community involvement ensured the projects stayed relevant and gained support, which further strengthened their financial impact.

Participants also discussed the extent of the contribution of IGPs. They acknowledged that while these projects didn't solve all financial issues, they provided crucial relief in reducing the deficits. The proportion of funding provided by IGPs was another key point. Respondents noted that these projects often covered a significant part of operational needs, especially in areas like partnerships and outreach programs. This integration of IGPs into broader academic and community programs increased their financial and institutional value. In general, the combination of quantitative and qualitative findings showed that IGPs played a dual role. They were important financial tools that helped reduce budget deficits and strategic initiatives that supported the

universities' missions. This integration of evidence and perspectives demonstrated why IGPs were essential for the financial health and sustainability of public universities in Tanzania.

5. Conclusion

In conclusion, the study established that Income Generation Projects (IGPs) are pivotal in financing budget deficits in Tanzanian public universities, with their importance derived not only from the revenue they generate but also from their alignment with institutional missions and the active involvement of stakeholders. The quantitative findings confirmed that the relevance of IGPs significantly contributes to reducing budget deficits, while the qualitative insights explained that this relevance stems from their ability to address funding gaps, support teaching and research, and foster community engagement, thereby ensuring sustainability and legitimacy. Although IGPs may not fully resolve all financial challenges, they provide a critical cushion that mitigates the adverse effects of declining government funding. Compared to global studies, the Tanzanian experience extends the debate by emphasizing that the success of IGPs depends on strategic alignment and inclusive governance, not merely financial returns. Overall, the relevance of IGPs lies in their dual capacity to strengthen financial resilience while simultaneously advancing the educational mission of public universities.

6. Recommendations

Based on the findings, it is recommended that public universities in Tanzania strengthen the planning, management, and monitoring of Income Generation Projects (IGPs) to maximize their contribution to financing budget deficits. Specifically, universities should;

- Prioritize strategic alignment by selecting projects that support the university's core missions of teaching, research, and community engagement, ensuring both financial and institutional relevance.
- Encourage active stakeholder involvement, including faculty, administrative staff, and local communities, to build ownership, legitimacy, and sustainability of projects.
- Strengthen governance structures through transparent financial reporting, accountability mechanisms, and robust evaluation frameworks to enhance trust and long-term viability.
- Diversify IGP portfolios to balance short-term income-generating initiatives with long-term investments that contribute to institutional growth and stability.
- Introduce incentive mechanisms for staff participation and promote an entrepreneurial culture within universities to embed IGPs into institutional practices and enhance their effectiveness.

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Conflicts of Interest Statement

The authors declare that they have no financial or personal interests that could influence the results of this paper.

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References

- Ahmad, A. R., Ng, K. S., & Ngeoh, P. T. (2015). Income Generation Activities among Academic Staff at Malaysian Public Universities. *International Education Studies*, 8(6), 194–201. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1067805.pdf>
- Archibald, M. E. (2017). *Resource dependency theory*. Encyclopaedia Britannica. Retrieved from <https://www.britannica.com/topic/resource-dependency-theory>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications. Retrieved from https://books.google.co.tz/books/about/Research_Design.html?id=335ZDwAAQB&redir_esc=y#:~:text=Research%20Design:%20Qualitative%2C%20Quantitative%2C%20and%20Mixed%20Methods%20Approaches,-John%20W.&text=This%20best%2Dselling%20text%20pioneered,and%20research%20in%20mixed%20methods.
- Davis, R., & Miller, T. (2016). Strategic alignment in higher education projects. *Higher Education Review*, 39(2), 112–128.
- Delmonte, C. M. (2021). Management practices in the implementation and sustainability of income-generating projects. *International Journal of Business and Technology Management*, 3(2), 14–33. Retrieved from <https://scholar.google.com/citations?user=WVcvFHQAAAAJ&hl=en>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning. Retrieved from https://eli.johogo.com/Class/CCU/SEM/ Multivariate%20Data%20Analysis_Hair.pdf
- Mahmud, A., Nuryatin, A., & Susilowati, N. (2022). Income-generating activity in higher education: A case study of a public university in Indonesia. *International Journal of Evaluation and Research in Education*, 11(1), 303–312. Retrieved from <https://ijere.iaescore.com/index.php/IJERE/article/view/22050>
- Marcos, G. A. (2024). *Income Generating Projects Implementation: Learning from the State Universities and Colleges' Best Practices for Sustainable Extension Programs for Children*. Zamboanga State College of Marine Sciences and Technology, Philippines. Retrieved from <https://www.researchgate.net/publication/376705729>
- Mbugua, H. N., Gatauwa, J. M., & Waweru, F. W. (2024). Effects of income-generating activities and donor funds on the liquidity of public universities in Kenya. *African*

- Development Finance Journal*, 8(2), 39–61. Retrieved from <https://uonjournals.uonbi.ac.ke/ojs/index.php/adf/article/view/2635>
- Meehl, P. E. (2010). Diagnostic taxa as open concepts: metatheoretical and statistical questions about reliability and construct validity in the grand strategy of nosological revision. Retrieved from <https://psycnet.apa.org/record/2010-13146-008>
- Mgejwa, J. S. M., Kosgei, Z., Bomet, E., & Khau, M. (2025). The impact of sustainable income-generation projects on financing budget deficit in public universities in Tanzania. *European Journal of Education Studies*, 12(5). Retrieved from <https://www.researchgate.net/publication/392241945>
- Montemayor, M. C. R. P. (2024). Income-generating projects among state universities and colleges in the MIMAROPA region: Basis for an enhanced IGP framework. *Psychology and Education: A Multidisciplinary Journal*, 19(10), 1028–1049. Retrieved from <https://journals.indexcopernicus.com/api/file/viewByFileId/2307060>
- Mwaitete, C. (2024). Role of Higher Education for Economic Transformation (HEET) Projects on Youth Income Generation and Unemployment: A Case of Mzumbe Ward. *NG Journal of Social Development*, 13(1). Retrieved from <https://www.researchgate.net/publication/381012479>
- Ouma, O. W., & Kiarie, D. K. M. (2017). Role of stakeholders' involvement in sustainability of Constituency Development Fund projects in Kenya: A case of Nakuru Town East Constituency. *International Journal of Entrepreneurship and Project Management*, 2(3), 1-13. Retrieved from <https://ideas.repec.org/a/bdu/oijepm/v2y2017i3p1-13id506.html>
- Salleh, K. M., Sulaiman, N. L., & Gloeckner, G. (2023). Exploring test concept and measurement through validity and reliability process in TVET research: guidelines for the novice researcher. *Journal of Technical Education and Training*, 15(1), 257-264. Retrieved from <https://www.researchgate.net/publication/369763230>
- Teixeira, P. N., Rocha, V., Biscaia, R., & Cardoso, M. F. (2014). *Revenue Diversification in Public Higher Education: Comparing the University and Polytechnic Sectors*. *Public Administration Review*, 74(3), 398–412. <https://doi.org/10.1111/puar.12215>
- Tolbe, E. (2020). Management practices and economic benefits of the income-generating projects of the state universities and colleges. *Journal of Critical Reviews*, 7(11), 156-161. Retrieved from <https://www.researchgate.net/publication/358403028>
- Wathome, D. M. (2013). Factors influencing sustainability of community service order projects in Kiambu county, Kenya (Doctoral dissertation, University of Nairobi). Retrieved from <https://erepository.uonbi.ac.ke/handle/11295/60125>
- Weyant, E. (2022). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches: by John W. Creswell and J. David Creswell, Los Angeles, CA: SAGE, Retrieved from https://spada.uns.ac.id/pluginfile.php/510378/mod_resource/content/1/creswell.pdf