

PUBLIC PRIVATE PARTNERSHIPS AND PROCUREMENT PERFORMANCE OF MEGA PROJECTS IN THE ENERGY SECTOR IN KENYA

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ABSTRACT

Governments around the world face a rising demand for infrastructure. Most governments, including Kenya, are attempting mega projects to bridge the infrastructural gap. Kenya has prioritized, under the Kenya Vision 2030, a number of Mega projects. However most mega projects have, (or are), experienced procurement related challenges, which threaten their efficient implementation thereby threatening achievement the Vision 2030 aimed at transforming Kenya into a middle income Nation. The energy sector, a critical support sector of the Vision 2030 pillars, plans to increase power production by 10,000Mw by the year 2030, from the estimated production of slightly above 2000MW, through an array of mega projects. This study set out to examine the influence of Public Private Partnership on the procurement performance of Mega projects in the energy sector in Kenya. The study entailed a census of all the 47 mega projects under the various public procuring entities in the energy sector. The unit of observation was the procurement managers in the procuring entities dealing with mega projects. Objectively developed questionnaires were used to collect primary data. The data collected was sorted, coded and entered into the computer statistical package (SPSS), for production of descriptive and inferential statistics. The study established a significant influence of PPP on procurement performance of mega projects in the energy sector. The study also established a moderate adoption of PPP in the acquisition of mega projects in the energy sector in Kenya. Therefore this study recommends to the energy sector management, to adopt enhance adoption of PPP practice in the acquisition of mega projects in the energy sector. This would be a faster and less costly means of achieving of the energy plan aimed at increasing energy production to 10,000MW in line with the Kenya vision 2030. Whilst adoption of PPPs portends benefits of reduced cycle time, cost and improved quality of mega projects; it would be insightful to establish the models of PPP that would be most suitable for different aspects of power development: exploration (drilling), plant development, and power evacuation in the energy sector.

Key words: Public Private Partnership; Mega projects; Procurement Performance.

1.1 Background of the Study

Largely driven by lack of adequate funds to finance mega projects, and the need for cost efficiency and quality (Meidute & Paliulis, 2011; Cheng, Chan & Kajewski, 2009), governments worldwide are adopting the PPP model of project acquisition in different proportions and propensity, which represents a paradigm shift from the traditional design to bid model of project procurement. In the UK, Partnership UK (2010) reports that more than 700 PPP contract have been implemented successfully in the period 1999-2009, valued at \$98 billion, half of which would have otherwise not have been possible using the traditional procurement model. The United States, a newcomer to PPPs, has turned to PPP model of acquiring projects due to infrastructure finance deficit of \$1.1 trillion over the period 2009-2014. (BMI, 2014) Developing countries in the same period, 1999-2009, have also recorded a remarkable use of PPP. In Sub-Saharan Africa, an estimated \$755 billion in private investment across nearly 2,500 infrastructure projects have been recorded in roads, schools, water reclamation, hospitals, prisons and the provision of health (Mckinsey, 2013).

Facing the universal failure paradox in mega projects (Flyvbjerg, 2003), governments in Africa, just like their global counter parts, are adopting PPPs. Deloitte (2015) reports that in 2015, Private sector owned 10% of total mega projects representing an increasing from 4% reported in 2013, showing a rise in popularity in PPPs that have been taunted to offer greater effectiveness in acquisition of Mega projects (EIU, 2015; OECD, 2010, & WB, 2010) Developing countries in the period, 1999-2009, have also recorded a remarkable use of PPP. In Sub-Saharan Africa, an estimated \$755 billion in private investment across nearly 2,500 infrastructure projects have been recorded in roads, schools, water reclamation, hospitals, prisons and the provision of health (Capital 2012). OECD (2010), from review of case studies notes that there have been mixed experiences with Africa's PPPs and suggests that successful partnerships have been characterized by a favorable legal environment.

Experience and investment in PPPs is somewhat varied across Countries in Africa and seem to depend on infrastructure priorities of these countries. For instance, Kenya has a great experience in energy sector with growing experience in transport and water sectors, while in Nigeria the road sector has more developed laws and practices than rail. Côte d'Ivoire on the other hand has great experience in water and power than in other areas of the economy. (Kristy, 2014; EIU, 2015; Diko, 2014; and Mensah, 2014) OECD (2012) asserts that PPPs, though gaining momentum in Africa, are still underused even as they have been taunted to transform the inefficient delivery of public projects acquisition. When well designed with proper cost recovery, appropriate risk allocation and investor protection, PPPs can drive essential infrastructure in a context of limited government financing (Osei *et al*, 2014).

Owing to serious budgetary constraints against rising infrastructure demands as outlined in the Vision 2030, Kenya like most like most countries in the rest of the world has a growing interest in PPPs (EIU, 2014). The budgetary allocation for infrastructure in the FY2013/2013 was only \$3.2 billion, which translated to less than 9% of the GDP against a requirement of 15% (ROK, 2012). The Ministry Of Finance of Kenya, estimates a need of \$60 billion for infrastructure investment in the period 2012-2020 (ROK, 2012) however, only \$25 billion can be provided through normal budgetary process. This builds a solid case for the need to take up PPPs .

Kenya is not new to PPPs. However, Few PPPs have been finalized in the past decades in Kenya including Mtwapa and Nyali Bridges Concessions signed in 1959; Westmount 46 MW (not active), Iberafrica 1997 (56MW thermal power plant), The 74 MW Tsavo/Kipevu IPP, 2000, Orpower -Olkaria III 2000/2008(48MW Geothermal Plant), Mumias (34MW power plant); 90 MW Rabai Independent Power

Project in 2009, Port of Mombasa Grain Terminal –BOO, 1998; and the JKIA –Cargo Terminal, 1998 (PPPU, 2016). In the recent past however, interest in Public Private Partnerships has more than doubled. Information provided by the Government PPU unit shows that over 56 multimillion projects have already been approved between the year 2004 and 2016. (ROK, 2016)

According to official communication on past PPP projects by GOK (2016), the energy sector in Kenya, accounts for a big share of previous, current and planned PPPs. Of the past 12 PPP projects between 1959 and 2009, 7 were in the energy sector (ERC, 2012, GOK 2016). In the current list of National priority PPP projects, provided by the National Treasury, the energy sector features heavily with an estimated \$19.8 billion investment to produce additional 10,000 Megawatts of power by 2030 (GOK, 2014). The ministry of energy draft national policy, October 2014, shows that the government aspires to deliver additional 5000MW by 2019 and 10,000 additional MW by 2030, in line with the vision 2030, through Independent Power Producers (IPPs) through the PPP Act 2013 (GOK, 2014). However, the 5000MW program has already been labeled inspirational. Between June 2014 and March 2015, only 410MW additional megawatts were generated through new IPPs. New IPPs, for instance the 310 MW Lake Turkana wind project of December 2014, are being financed but these are small compared to the ambitious 5000MW program. While others, for instance, the 60 MW Kinangop project, financed in November 2013, are facing difficulties due to variety of factors (USAID, 2015)

1.1.1 Statement of Problem

Mckinsey (2013), PPPs enable accelerated infrastructure development in light of public finance constraints. For instance, The USA, traditionally slow on PPP, achieved over 12 major investments, through PPPs, worth over \$20 Billion between 2009-2011(BEA 2011& PWF 2011). In the UK, Over 700 PPP were completed fairly within budget and on time, between 1999 and 2009, valued at valued at \$98 billion in the last decade. (HM Treasury 2013)

In Kenya, Mega projects, prioritized under the Kenya Vision 2030, have experienced procurement related challenges, which threaten their efficient implementation thereby threatening achievement of the Vision 2030 aimed at transforming Kenya into a middle income Nation. For instance, the KES 15Billion Kinangop IPP power project, the 700mw Liquefied Natural Gas PPP project; KeS200Billion Lamu coal project; and the \$551m greenfield JKIA project; have experienced failure, attributed to procurement related challenges such as: cancelled tender award due to irregularity; socio-political resistance; lack of adequate finances; and non-responsive tender process (ROK, 2013; ROK, 2014; KAA, 2016 & Rita, 2016)

Accelerated adoption of Public private partnerships in Kenya could portend efficiency in procurement and implementation of mega projects in the energy sector. It would thus be insightful to examine the relationship between Public Private Partnership and Procurement Performance of Mega Projects in the energy sector in Kenya.

1.1.2 Specific Objective

To assess how Public Private Partnership influences procurement performance of mega projects in the energy sector in Kenya.

1.1.3 Research Hypothesis

There is no significant influence of Public Private Partnership on procurement performance of Mega projects in the energy sector in Kenya.

2.1 Literature Review

2.1.1 Theoretical Review: Bensaou Relationship Portfolio Model

According to Sanderson, Lonsdale and Mannion (2015), the Bensaou relationship portfolio model, classified among other purchasing portfolio models such as Krajlic (1983) was fronted by Bensaou (1999), for use in analyzing and proposing different types of buyer-supplier relationship. The model makes significant contribution to the area of supplier relationship management by explaining the practical factors that determine the nature of the buyer supplier relationship (Caniels, Gelderman & Ulijn, 2010). The model explains that it's the level and balance of relation-specific investment that determine the nature of relationship between buyer and supplier.

Gelderman, Caniels, and Fluere (2011) describe these specific investments as “expensive and difficult to transfer investments” and they include buildings, tooling, equipment, expertise. According to Lonsdale, Kirkpatrick, Hoque and Ruyter (2010), Bensaou (1999) identified four types of buyer supplier relationships: strategic partnership, captive buyer, captive seller, and market exchange; and explain that when the specific investments are high for both buyer and seller in a specific procurement, then a strategic partnership would be adopted, and when low for both parties, the opposite extreme, market exchange, relationship would be adopted.

The Bensaou model provides adequate lens to view and understand the rationale and elements of public private partnerships in Public procurement of Mega projects. In the Bensaous Model, Lee and Drake (2010) outline that strategic partnership have a high level of relational specific investment. PPPs are a developing model of acquiring and implementing public projects that involve a significant level of private entity finance, design and implementation, usually over multi year periods of financing (BMI, 2014, and WB, 2011).

From this perspective, PPPs could be seen as a form of advanced strategic partnership between the public procuring entity and the private sector. The key characteristics of the strategic partnership type of relationship in the Bensaou (1999) model, as explained in Lee and Drake (2010): rich and frequent information exchange, high commitment and trust, extensive joint action, cooperation, and early supplier involvement; mirror the characteristics of a public private partnership. This emerging and developing form of supplier (contractor) relationship is being seen as a supplier relationship strategy to overcome inefficiencies in mega projects acquisition in Reeves (2011).

The strategic partnership (PPPs), portends opportunity to improve procurement performance of mega projects through; assuring project finance, early supplier involvement especially in design, and cooperation by bundling multiple aspects where cost and payback have a direct relationship (Siemiatycki, 2015, Reeves, 2011, BMI, 2014).

2.1.2 Empirical Review

Most studies have focused only on exploring the drivers of PPP adoption. For instance Malek and Akalkotar (2016) study focuses on examining the driving force of PPP adoption in Hongkong, and Australia; while

Osei *et al* (2014) explores the reasons behind adopting PPP in construction projects in Ghana, inform of a questionnaire survey. Ismail (2013) adopts a similar approach, questionnaire survey, to interrogate the factors attracting the use of PPPs in Malaysia. In somewhat related studies, Tingting and Suzzane (2011), studies the drivers and obstacles of PPP adoption in New Zealand, while Karikari (2015) explores the benefits of PPP adoption in Ghana. These studies identify: project financing, technology transfer, and project economies, as key factors attracting the use of PPP.

Medda *et al* (2012) studies impact of PPPs in European transport system while Dieguez and Alfonso (2012) provides insight on PPP models in Spain's mega projects. These studies have also been done outside Kenya, mostly in transportation sectors. Similar studies could be done in Kenya. Whilst informative to the PPP aspect of this study, these study fall short of enriching analysis on impact of PPPs on procurement performance of mega projects. Huge part of recent existing research effort; Malek and Akalkotar (2016), Osei *et al* (2014), Ismail (2013), Tingting and Suzzane (2011), and Babatunde *et al* (2015); has focused on explaining PPP adoption. These studies give plausible explanation to the aspect of this study, but are inadequate to answer the research questions, as they do not examine, empirically, the influence of PPPs on procurement of mega projects.

3.0 Research Methodology

The study on Impact of Public Private Partnership on Procurement performance of mega projects in the energy sector in Kenya adopted an exploratory approach using a descriptive research design. Exploratory research design is a flexible approach that allows consideration of various aspect of the study (Gill & Johnson, 2010), while Descriptive survey research portrays an accurate profile of persons, events, or situations (Cresswell 2009) in their current state.

The study focused on mega projects in the energy sector in Kenya as the unit of analysis. Therefore the population of this study was all the mega projects in the energy sector in Kenya. The target population was thus the 47 mega projects in the energy sector, under the various procuring entities in Kenya; KenGen, KETRACO, KPLC, GDC, Kenya Pipeline, and MoE&P. The study entailed a census of all the 47 mega projects identified in the energy sector in Kenya. Bhattacharjee (2012) notes that a census is preferred when the study population is small; and is advantageous as it offers opportunity to undertake intense study of population. The unit of observation was the procurement managers in the procuring entities in the energy sector who were suited to provide factual data on acquisition of the mega projects.

Whilst various methods could be used to collect primary data, including questionnaires and interview methods objectively prepared Questionnaires were used. As explained in cooper (2011) and Palinkas (2010), they are preferred over interviews as they provide a more effective and efficient way of collecting data where respondents are spread widely. Questionnaires were used to obtain data linking Public Private Partnership and procurement performance of mega projects in the energy sector in Kenya. A pilot study was conducted on 10% of the sample to detect and review weakness of the proposed questionnaire, as recommended by Cooper and Schindler (2011). To test reliability, the study relied on the Cronbach's alpha (α). Public Private Partnership had a score of 0.878, which is deemed acceptable in line with recommendations by Ritter (2010). The study considered various as aspects of validity, Content, and construct were considered

4.1 Results and Discussion

4.1.1 Response Rate

In the survey of the 47 projects in the energy sector in Kenya, 47 questionnaires were issued. A total of 47 questionnaires were returned. However, only 31 questionnaires were responsive. Therefore, the study achieved a response rate of 65.9%, with 31 responsive questionnaires, out of 47 issued questionnaires. This is deemed a sufficient response rate in a survey in line with Creswell and Plano (2011) recommendation that a response rate above 60% is sufficient to permit data analysis. Similar studies on procurement practices and procurement performance by Odero and Ayub (2017), and Dede and Theuri (2018) yielded 72% and 82% response rate respectively. This shows that the study's response rate is within the norm. Most of the non responses were because some projects were yet to start, or were in the process of acquisition, or had failed to kick off; thus little or no information was available for the projects

4.1.2 Estimated Value of the Projects Surveyed

Analysis of the data collected in the survey indicates that projects are estimated to be worth KES 0.6 Trillion (KES 600,000,000,000): The lowest project value was worth KES 202 Million, while the project with highest value was worth KES 100 Billion. All the projects were running for more than two financial years. These projects therefore fall within the description of mega projects as described by Hall and Khan (2006), Mckinsey (2012), and Flyvbjerg (2003), that mega projects are those endeavors, or undertakings, typically having multi-million or even billion dollar budgets; time-frames measured in years, and attracting a high level of public or political attention.

4.1.3 Descriptive Findings on Public Private Partnership and Procurement Performance

To better understand the nature and form of PPPs, Respondents were asked to identify the various characteristics and benefits of PPPs in the various mega projects in the energy sector in Kenya. Analysis of the feedback indicated that Independent Power Production under Build, Own, Operate, and Maintain (BOOM) model, and private financing were most prominent characteristics at 56% and 20% respectively. Collaboration in design was also a key feature. This indicates that PPPs in the energy sector in Kenya have similar characteristics as PPPs across the globe such as private entity financing, collaboration in design, early supplier involvement (EIU, 2014; WB, 2011; Siemiatycki, 2015; and Reeves, 2011) The results on characteristic of PPPs in projects in the energy sector in Kenya are shown in Table 1.

Table 1: Responses of Characteristics of PPPs in the Energy sector Projects

Characteristic	Frequency	Percentage
1. Build, own, operate and maintain IPPs under a 20yrs PPA	18	56
2. Private financing	6	20
3. Private Plant development	5	15
4. Public Private collaboration in design	3	9
Total	32	100

The study also sought to find out the benefits that accrue to mega projects through adoption of PPP. Analyzed feedback on Benefits of PPPs over the traditional bid to design Model of project acquisition revealed that PPPs offer efficiencies such as faster delivery and assured project funding which is reported in 36% and 46% of the projects surveyed. This implies that mega projects in the energy sector acquired through PPP are completed faster and are better funded. It also implies that risk and contract management is more efficient for projects procured through public private partnership. These findings agree with Reeves (2011) that PPP often provide opportunity to deliver projects faster, assure project financing and present an innovative way to deal with risk associated with mega projects globally (Delmon, 2015) These results are presented in Table 2.

Table 2: Responses on Benefits of adopting PPP in project acquisition

Benefits	Frequency	Percentage
1. Assured Project Funding	23	46
2. Faster delivery	18	36
3. Efficiency in risk and contract management	6	12
4. Innovation	3	6
Total	50	100

Further, propositions were made about aspects of PPP and procurement performance and respondents were asked to indicate the extent, (key: 1-not at all, 2-little extent, 3-moderate extent, 4-great extent, 5- very great extent), to which the propositions characterized the mega projects. Results of the analysis shows that all aspects of PPP had mean scores above 3.000. This implies that aspects of PPP in this study: ESI; collaboration between public and private entities; rich information exchange; contract bundling; and private financing; characterize mega projects in the energy sector moderately. This further implies that the level of PPP adoption is moderate in procurement of Mega projects in the energy sector. This finding agrees with an EIU (2014) report that labeled Kenya an Emerging PPP market. PPP adoption is not optimal; it is still a developing model of acquiring and implementing public projects. This analysis is summarized in Table A-1 in the appendix.

4.1.4 Diagnostic Tests

Data collected on Global Sourcing and procurement performance was tested for normality in line with recommendation by Ghasemi and Zahediasl (2012). Since the unit of observation and analysis was Heads of supply chain or equivalent and Mega projects respectively, data obtained was expected to be seen to be normal. This study relied on the Shapiro-Wilks', W, test; to test Normality of data.

The results for the Shapiro-Wilks Test, W, of data on Public Private Partnership was not significant (P-value=0.121), which according to Razali and Wah (2011), and Garson (2012) indicates a normal distribution. The study also performed the test of multi-co linearity by calculating the Variance Inflation Factor values (VIF) and Tolerance as recommended by Collis and Hussey (2014). The results show that

VIF of data on Public Private Partnership (VIF=1.369) was less than 10. This indicates non multi collinearity as recommended in Collis and Hussey (2014).

The study also undertook a test of linearity, using Correlation analysis, to establish whether further analysis would yield the desired relationship (Fields, 2009) that could be further explored using other statistical tools Kothari (2008). The analysis yielded a Pearson Product Moment Correlation Coefficient, $r=0.575$, P-value (0.001), indicating a significant and positive linear relationship between Public Private Partnership and procurement performance.

4.1.5 Regression Analysis

This research was guided by the null and alternative hypotheses: H_0 : *There is no significant influence of PPPs on procurement performance of Mega projects in the energy sector in Kenya.* H_a : *There is significant influence of PPPs of PPPs on Procurement performance of mega projects in the energy sector in Kenya.* A regression of influence of procurement performance and PPP was done using the following model: $Y = \beta_0 + \beta_1 X_1 + \epsilon$: Where; Y is Procurement Performance, β_0 is the intercept, β_1 is the change in procurement performance occasioned by a unit change in X_1 (PPP).

The findings, as shown on Table 3, indicate that the calculated p-value is 0.001, which is less than 0.05, at 95% confidence interval. This means that PPP has a significant influence on Procurement performance of mega projects. Therefore, H_0 : *There is no significant influence of PPPs on procurement performance of Mega projects in the energy sector in Kenya,* is rejected and H_a : *There is significant influence of PPPs of PPPs on Procurement performance of mega projects in the energy sector in Kenya,* is accepted. The regression analysis further indicates variances (R^2) as 0.331 which shows that 33.1% of Procurement performance of Mega projects is influenced by PPP practice. From this analysis the regression model could be written as: Procurement performance=1.349+0.046 (PPP practice). This means that an increase in mean index of PPP will increase Procurement performance of mega projects by a mean index value of 0.046.

Table 3: Regression of Procurement performance on PPP

R	R ²	ADJ R ²	Std Error
.575	.331	.307	.59190

F=14.317, Sig=.001, Constant (B=1.349, t=2.962, sig=.006), PPP (B=.046, t=3.784, sig= .001)

This implies that adoption of PPP in the energy sector could enhance the procurement performance in acquisition of mega projects. This finding agrees with Reeves (2011), who posits that PPPs, offer opportunity to improve efficiency in delivery of mega projects, and thereby earning them a reputation to deliver projects on time and cost; a reversal of the perennial time and cost overruns that plagues mega projects (Flyvbjerg, 2014). The study further established that PPPs in the energy sector have characteristics similar to other PPPs worldwide, as postulated in Siemiatycki (2015) such: Early Supplier involvement, Collaboration, private financing, contract bundling. They are normally established as Build Own Operate, Maintain projects, normally under a Power Purchase Agreement.

Further, the study established that the aspects of PPP; ESI, collaboration, and contract bundling, technology transfer; moderately characterize mega projects in the energy sector, which supports EIU (2014) assertion that Kenya is still an emerging PPP market. This means therefore, that there exists opportunity, to improve adoption of PPPs in the energy sector. These findings compare with the study by Ismael (2013) who found that PPP provides public sector with creative, innovative solution to public projects. The PPP aspects: Early supplier involvement, Joint action, collaborative environment, Enhanced information sharing, project financing; though moderately characterizing the procurement of mega projects, were explicit in most mega projects in the energy sector in Kenya; and contributed to improvement in Procurement performance of the Mega projects.

These findings also agree with Newzealand *et al* (2011) and Quium (2011) who succinctly describe how PPPs offer opportunity for public sector to benefit from innovation, managerial skill of private sector, and technology transfer which results in cost and quality benefits in large projects. These findings exemplify the recommendations of the Bensaou relationship portfolio model that on high value investments, such as mega projects, firms should adopt strategic partnerships, such as PPP, which leads to: rich information exchange, high commitment among partners, and joint action (Lee & Drake, 2010).

5.0 Conclusion

The study established a significant influence of PPP on procurement performance of mega projects in the energy sector. The study also established a moderate adoption of PPP in the acquisition of mega projects in the energy sector in Kenya. Therefore this study recommends to the energy sector management, to adopt enhance adoption of PPP practice in the acquisition of mega projects in the energy sector. This would be a faster and less costly means of achieving of the energy plan aimed at increasing energy production to 10,000MW in line with the Kenya vision 2030. Whilst adoption of PPPs portends benefits of reduced cycle time, cost and improved quality of mega projects; it would be insightful to establish the models of PPP that would be most suitable for different aspects: exploration (drilling), plant development, and power evacuation in the energy sector.

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Table A-1: Aspects of PPP on Procurement Performance

ITEM	Percent (%)					MEAN	SD.
	1	2	3	4	5		
ESI in design reduces costly design changes post contract	6.5%	9.7%	41.9%	35.5%	6.5%	3.26	0.965
ESI in design ensures realistic specifications thus improving compliance.	6.5%	12.9%	32.3%	41.9%	6.5%	3.29	1.006
ESI enhances design feasibility which reduces chances of project failure	6.5%	12.9%	38.7%	35.5%	6.5%	3.23	0.990
ESI enhances contractor entity relationship thus reduces conflicts	6.5%	16.1%	29.0%	29.0%	19.4%	3.39	1.174
Supplier collaboration enhances risk identification and sharing	6.5%	3.2%	19.4%	35.5%	35.5%	3.80	1.136
Collaborative Environment enhances information exchange (cost and risk forecast)	6.5%	12.9%	41.9%	25.8%	12.9%	3.26	1.064
Collaboration enhances joint action in risk management, and problem solution	3.2%	9.7%	48.4%	29.0%	9.7%	3.32	0.909
The joint action and collaborative environment enhances innovation	3.2%	6.5%	48.4%	32.3%	9.7%	3.39	0.882
Contract bundling motivates compliance to quality	6.5%	12.9%	41.9%	29.0%	9.7%	3.23	1.023
Supplier commitment assures availability of project financing	3.2%	16.1%	29.0%	38.7%	12.9%	3.42	1.025
Collaborative negotiation ensures a more realistic risk management framework	6.5%	12.9%	38.7%	32.3%	9.7%	3.26	1.032
Enhances the technology transfer process	0.0%	6.7%	36.7%	43.3%	13.3%	3.63	0.809