

# ELECTRONIC PUBLIC PROCUREMENT IN BANGLADESH

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## Benefits and Costs of Introducing E-Procurement in Bangladesh



SMARTER SOLUTIONS FOR  
**BANGLADESH**





# Electronic Public Procurement in Bangladesh

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Bangladesh Priorities

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## I. Introduction<sup>1</sup>

An efficient public procurement system in a country is essential for effectual public investment and economic growth. However, in developing countries like Bangladesh, public procurement is plagued with various inefficient and corrupt practices.<sup>2</sup> For example, a common problem in public procurement is the collusive behaviour of the bidders where they submit false bids at exorbitant rate managing a high winning price. At the local level, elites, sometimes politically connected, often “physically” block the non-political contractors to participate in the bidding process.<sup>3</sup> They can do so due to their political networks in the law enforcement agencies. This sometimes results into conflicts and non-collusive bidders often do not take part in the bidding process making collusion more effective which in turn results in a higher price.<sup>4</sup>

These illegal activities result in inefficiencies beyond simply higher prices of a procured good or work. For example, an inefficient bidder may win the contract resulting in poorer quality output, delays in project completion and cost overrun. Furthermore, these bidders may illegally outsource the contract to an unqualified bidder which may also result in the above mentioned inefficiencies.

In a recent letter to the Finance Minister, the Planning Minister has pointed out a number of benefits of an electronic procurement system in Bangladesh, known as electronic Government Procurement or e-GP in short, and recommended to scale it up to most other ministries.<sup>5</sup> The benefit of an IT based electronic procurement system in this context is obvious. It removes all the possibilities of human manipulation at the bidding process, ensures greater participation, increases transparency and reduces conflicts in the bidding process.<sup>6</sup>

This paper attempts to conduct a cost-benefit analysis of this e-GP initiative. The benefit of e-GP is obvious. Since participation is online, any registered user with internet can apply. Also, as bidders can participate from home or office removing the necessity to visit the procuring entity’s office, the collusive elite-bidder groups cannot block non-collusive bidders anymore from participating in the

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<sup>1</sup> The results of this paper build upon an earlier study, Abdallah (2015), which was funded by the International Growth Centre based at LSE and Oxford University

<sup>2</sup> See, for example, Ware, Moss, Campos and Noone (2007) for a comprehensive list of avenues of corrupt practices in public procurement.

<sup>3</sup> One of the ways this taking place is where the politically connected bidders have their youth groups sabotaging around the procurement entity’s office and when a non-collusive bidder appears, his tender documents are snatched. The English newspapers often call it “Tender Snatching”. See, for example,

<sup>4</sup> The news regarding such influences are abound. For recent example, see an incident reported in the online edition of Daily Star published on the March 26, 2014.

<sup>5</sup> The Daily Prothom Alo, October 23, 2015 issue.

<sup>6</sup> Ibid.

bidding process, resulting into greater competition and hence, lower prices for publicly procured goods, works and services. The benefit of e-GP hence stems from removal of artificial market distortions. This benefit is already estimated recently by Abdallah (2015). The cost will be operational and maintenance cost as well as training costs to the public officials who runs it. This cost estimation will be based on project documents and discussions with relevant officials.

The rest of the paper is organized as follows. Section II briefly outlines the institutional background, section III discusses estimation of the benefits, section IV discusses estimation of costs, section V provides the benefit to cost ratio and section VI concludes.

## II. Institutional Background

The e-GP is being implemented as part of a project, Public Procurement Reform Project II (PPRP II) funded jointly by the Government of Bangladesh and the World Bank. The implementing agency is the Central Procurement Technical Unit (CPTU) of Implementation, Monitoring and Evaluation Division (IMED), Ministry of Planning. The project has four components: 1. Furthering Policy Reform and Institutionalizing Capacity Development, 2. Strengthening Procurement Management at Sector Level and CPTU/IMED, 3. Introducing e-Government Procurement (e-GP) and 4. Behavioral Change Communication and Social Accountability. The Project was started in 2008 and expected to end by end of 2016.

Even though PPRP II started in 2008, the Government of Bangladesh has introduced electronic Government Procurement system in 2011. Initially, three agencies (Local Government Engineering Department (LGED), Roads and Highways Division (RHD) and Bangladesh Water Development Board (BWDB)) were effectively implementing it.<sup>7</sup> Later, the Rural Electrifying Board (REB) has also joined. The Central Procurement Technical Unit (CPTU) in the Ministry of Planning is assigned to manage the e-procurement process of all the agencies and also exercised e-GP along with these agencies. Currently, 2,067 public agencies have registered to e-GP along with 17,170 contractors (up to October 20, 2015).<sup>8</sup>

The process of the e-Government Procurement is very simple. According to the Rule, The Tender Notices of to-be-procured items under the electronic system are advertised in the e-GP website as well as in the national dailies. A bidder needs to log-on to the CPTU-managed e-GP website and place

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<sup>7</sup> Abdallah (2015).

<sup>8</sup> The Daily Prothom Alo, October 23, 2015 issue.

their bids for tenders of their interest. However, a bidder needs to register first in exchange of a lump-sum fee in the national e-GP system to be eligible to participate in the bidding process. The evaluation is done mostly electronically even though it is monitored by an evaluation committee to ensure that the right bidder is selected. All the bidders for a particular procured item can check the bid winner by logging into the e-GP system.

### III. Estimating Benefits

How does the e-GP system benefit the Bangladesh economy? The e-GP system improves the bidding process which will benefit the bidders and the procuring entities. First, the e-GP system makes participating in the bidding process relatively easy, resulting into reduction in cost of participation. In particular, the bidders do not have to travel to the procuring entity's office to collect bidding information and submit bids. This saves transportation cost and opportunity cost of traveling to the office. Second and more important, the bid submission is always a risky business as conflicts often ensue when politically connected bidders attempt to stop non-political bidders from participating. The online system allows bidders to participate from home reducing such risks significantly. We believe that these cost savings will be reflected in the final bids submitted by a bidder. In particular, a bidder can be expected to bid lower than before e-GP was initiated, everything else constant.

In addition, there is a market-wide benefit of the e-GP system caused by increased competition resulting from the lower cost of participation at e-GP. Particularly, anecdotal evidence suggests that the potential conflicts in the bidding process under the traditional system discouraged many non-political bidders from participating in the first place. By removing the necessity to visit the office, the online system should encourage more participation. Furthermore, the cost of participation in the bidding process is now uniform across all the bidders. Hence, bidders from across the country should be able to apply. This in turn will reduce the prices for publicly procured goods, works and services further.

It therefore suffices to track changes in procurement prices as the government adopts the e-GP system. Abdallah (2015) has investigated this using LGED's more than six thousand item-wise procurement data since 2010. LGED procures items (mostly public works) through their executive engineers' offices located in all the 64 districts. The headquarters in Dhaka provides the support from center which includes training facilities for e-GP. It turns out that the district offices started to adopt e-GP at different points in time with varied rate of adoption over time. He exploits this quasi-experimental setting to identify the effect of e-GP on the final bid price. Since the price depends

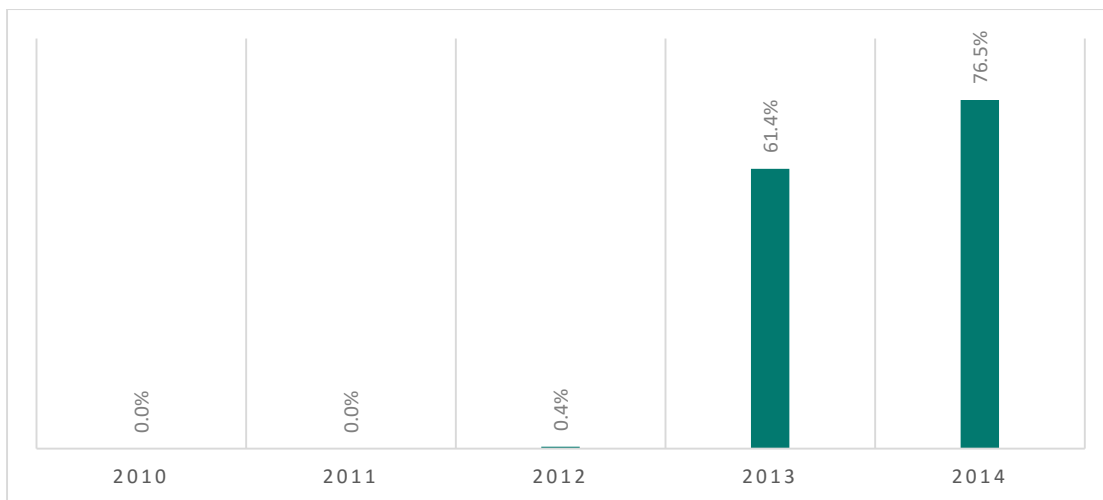


significantly on size of the item, he normalized the price with LGED’s own cost estimate of the same item. We will use this study as the benchmark estimate of benefits in the form of cost savings.

## Implementation of e-GP over time in LGED<sup>9</sup>

The progress of e-GP implementation as depicted by Abdallah (2015) is reproduced in figure 1. Between 2010 and January 2014, LGED procured about 4,806 items through traditional procurement system. Since 2012, LGED procured 1,845 items using e-GP. However, most of the procurement under e-GP occurred in 2013 and 2014. Even though e-GP started in 2011, LGED started using it in 2012 at an extremely limited scale: only 0.4% of all the items procured that year. This however picked-up fairly well in 2013 at 61.4% and further up at 76.5% in January, 2014. Currently, both LGED and CPTU officials claim that around 95% procurement of LGED are done through e-GP. The rest 5% could not be procured in this way since a few donor-supported projects have clauses that cannot be accommodated by e-GP.

**Figure 1: % of total LGED-procured items done under e-GP**



Source: Abdallah (2015)

<sup>9</sup> We consider LGED since it is the largest of the four agencies implementing e-GP, both in terms of number and value of items procured (See Abdallah (2015) for details).

## Impact of Electronic Procurement

How would the e-GP system affect public procurement? The CPTU claims that incidences of conflicts in the times of bid submission would decrease considerably.<sup>10</sup> This is expected as bidders do not need to travel to the procuring entity's office to collect bidding documents and submit their bids. They can do it from home online. The CPTU also indicated that there will be greater participation in the bidding process. This can be attributed not only to the more secured nature of bidding participation but also to the general simplification of bidding participation: anyone from any corner of the country now can apply. Simply put, the e-GP should increase competition.

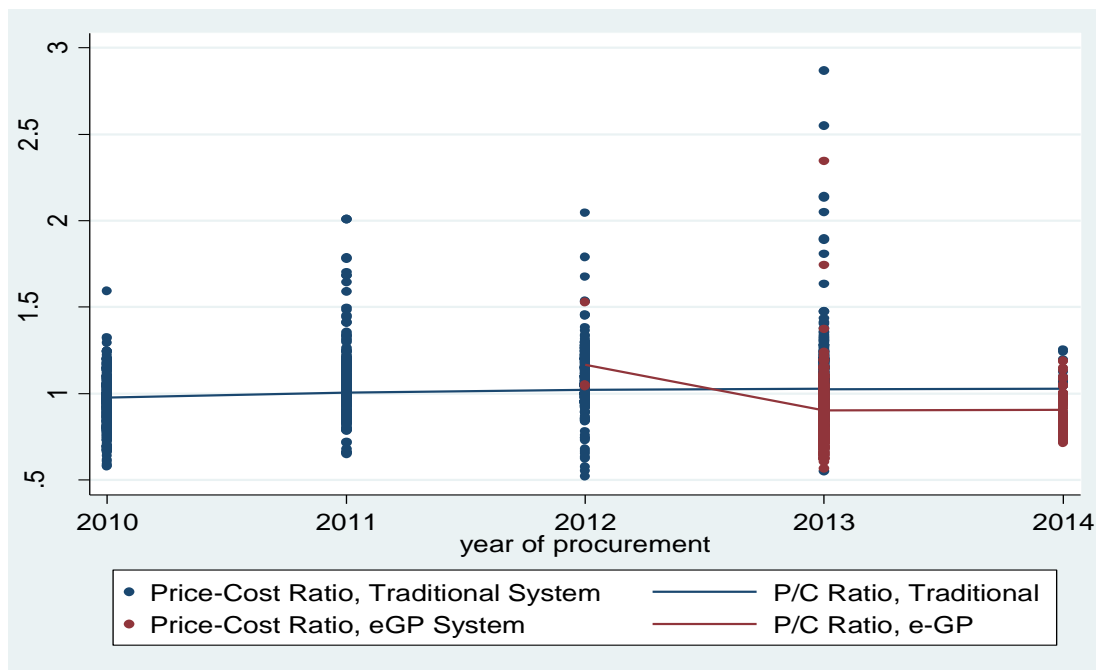
What are the implications of higher competition? Economic Theories suggest that increased competition should reduce price. Abdallah (2015) investigates exactly that. He compares package (item) level data of LGED procured items under traditional and e-GP system using more than six thousand procured items done by LGED between 2010 and January, 2014. He exploits the quasi-experimental setting provided by the variation in the e-GP adaptation at the district level over time to identify the effect of e-GP on price to cost ratio of procured items, also controlling for district level factors.

Abdallah (2015) investigates the effect of e-GP on procurement prices. Since procurement price depends on the actual size of the item, he considers procurement prices normalized by LGED's own cost estimate of the procured item, i.e., price-to-cost ratio. His results are reproduced in appendix table 1. He finds a robust decrease in price-to-cost ratio of procured items as LGED district offices adopt e-GP system. The effect is depicted in figure 2. The most robust estimate turns out to be 11.85% (column 6) and hence we consider this as our estimate to calculate benefits resulting from reduction in procurement price.

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<sup>10</sup> The Daily Prothom Alo, October 23, 2015 issue. There are also anecdotal evidences from the District Heads of local procurement entities confirming this.

Figure 2: Price-Cost Ratio over time under traditional system and e-GP system<sup>11</sup>



(Source: Abdallah 2015)

What are other potential qualitative effects of e-GP? First, since there are potentially more bidders, the set of winners are now more varied and competitive resulting into better quality of final output. Anecdotal evidence reported by a few Project Directors at LGED in fact support such possibility. However, this needs to be checked against quantitative data. Second, the degree of cost overrun may rise or fall. It may rise due to potential ratchet effect: bidders may underbid too much to win and later request for an over run. On the other hand, e-GP may result into winning of bids by more efficient firms who are expected to finish their job within the given budget better than before. Similarly, the projects may end on time or be delayed, depending on the type of the contract award winner.

### Extrapolating the estimates to other agencies

In order to use this estimate, we need to make few assumptions and restrictions to the analysis. First, it is important to recognize that the GOB procures three types of items: goods, works and services. The items procured by LGED are mostly works (construction works, e.g., local roads, bridges, culverts and buildings). Hence, the cost savings estimated can be applicable to procurement of works and to some extent, of goods and to lesser extent, of services. Hence, for this estimation we will consider only savings attributable to the procurement of works as the most conservative estimate whereas we

<sup>11</sup> The trend lines are estimated by lowess smoother.

will use both goods and works for a more optimistic estimate.<sup>12</sup> Second, we will assume that the decrease in price to cost ratio for works (and goods) to be experienced in other agencies will be the same as that experienced by LGED (11.85%), and assume that the price of procured services see no reduction from e-GP.

We looked into public procurement statistics of Government of Bangladesh (GOB) by types of items. Unfortunately, there is no single source where such statistics are stored. We hence looked into total amount of procurement done through Annual Development Program (ADP), which actually carries the bulk of the works procurement.<sup>13</sup> Some goods and services are procured under Revenue Budget, but this is of small proportion and very meagre amount for works, according to a senior public official. Hence, ignoring procurement under revenue budget and focusing only on procurement under ADP will underestimate benefits, but not significantly.

According to progress report of ADP for the fiscal year 2013-14, 73% of total procured items were works. Given that estimated value of all items procured was 721509.4 million taka, the annual benefits in 2013-14 if all the works items were procured through e-GP had been 62441.57 million taka. However, since these benefits will not be realized until the trainings of public officials are completed, we assume that the project will fully embark after completion of the training.

Other than cost savings, there are a few other potential benefits from procuring entity's side. The executive engineer, who runs the District office, saves effort cost that would have been required to manage the procurement under traditional system. It is however not possible to estimate the benefits of this cost savings. In that way, the benefits of e-GP will be underestimated.

## Final Life-time Benefit Estimate

For the final lifetime benefits, we first calculate annual benefits from the four target agencies (LGED, BWDB, RHD and REB). In 2014, the total value of procurement done by these agencies through e-GP was 49,958 million Taka worth of works. Given the 11.85% (of the price under traditional system) is the savings, the annual benefit to be realized from 2016 is 6,716 million Taka. The present value of the annual stream of benefits under different interest rate regimes are given in table 1. However, since these four agencies have already scaled up to their full potential, we do not include this benefit into our final estimate of life-time benefits.

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<sup>12</sup> The Cost-Benefit Analysis for this more optimistic scenario is presented in appendix table 4 with the assumptions presented in appendix table 3.

<sup>13</sup> A senior public official informed that more than 80% of works procurement are done through ADP.

For estimation of benefits to other agencies, we need to make a few assumptions. First, according to officials at Ministry of Planning and other target agencies, more than 95% of items in the target agencies are procured through e-GP in 2014. The other items had to be procured through traditional items due to donor conditions that cannot be accommodated in e-GP. It seems this small proportion of traditional procurement system needs to be maintained. More important, this can be expected to be true for all agencies and hence, the above mentioned annual benefit estimate needs to be adjusted accordingly.

Second, the other agencies have not taken up e-GP system at the same rate as these four agencies. But they have started to adopt it. One reason for this slow utilization is lack of trained staff who can use e-GP. We are assuming that training of these staffs will take two years. This is very conservative assumption since LGED, one of the largest agencies in terms of number of Class I public officials, have trained most of their staffs in less than two years. Furthermore, the adoption of e-GP can be expected to be gradual (in commensurate with the staffs getting trained). Nevertheless, given the two year training period and assuming that the agencies start to implement e-GP after two years (since 2018), the benefit from 95% e-GP implementation will start to be realized since 2018.

**Table 1: Estimation of Lifetime Benefits and costs**

Items	In Millions Annual Benefit/Cost	Interest Rate		
		3%	5%	10%
<b>Benefits</b>				
Benefits to Other Agencies	52,741.68	1,657,136.37	956,765.15	435,881.65
<b>Total Benefit</b>		<b>1,657,136.37</b>	<b>956,765.15</b>	<b>435,881.65</b>
<b>Costs</b>				
Hardware and Software cost in new agencies	985.84	985.84	985.84	985.84
Operations and Maintenance Cost	6.20	206.67	124.00	62.00
Training Cost	171.15	337.32	334.16	326.75
<b>Total Costs</b>		<b>1,529.83</b>	<b>1,444.00</b>	<b>1,374.59</b>
<b>Benefits to Cost Ratio</b>		<b>1083.22</b>	<b>662.58</b>	<b>317.10</b>

The total amount of allocation for works is 526,933m taka. Part of this is already procured through e-GP from four agencies and needs to be accounted for before estimating benefits from rolling out e-procurement to all ministries. Since e-GP gives an approximate 11.85% savings over the estimated cost, the allocated budget based on the estimated cost will be  $49,958/0.9$ . Since 95% is procured through e-GP, total amount procured by the four target agencies are therefore  $49,958/(0.9*0.95)$  and total amount of works to be procured by other agencies =  $526933 - 49,958/(0.9*0.95) = 468,503$ m taka. With 11.85% cost savings from 95% of these works procurement through e-GP, this amounts to 52,742m taka in savings per year. The present value of this benefit to be realized in 2018 will be  $52,742/(1 + i)^2$ . The stream of these benefits over the infinite horizon is estimated in table 1.

## IV. Estimating Cost

Implementation of e-GP involves cost. We use project documents like Aide Memoire and Procurement Plans of PPRP II to identify cost figures. Unfortunately, some cost figures are reported in aggregates with other components of PPRP II and therefore, we used interviews with officials for average cost figures. We also used Bangladesh Yearbook to estimate total number of public officials to be trained.

There are several sources of costs. First, there is a hardware and software cost. These costs are already incurred at CPTU, IMED and the four target agencies and hence sunk. But we use the cost figures to estimate cost amount that may be required in other agencies. It turns out that these four agencies procured 9.5% of total works procurement. Hence, given this incurred cost is USD 1.1m (with computer furniture cost = USD 94,000), with exchange rate 77.63, the total amount of hardware and software cost amounts to 986 million Taka. We assumed that this has to be realized in the beginning of 2016 since without it, the line ministries will not be able to implement it properly.

Second, the most important source of cost would be involving setting up of the server. However, since the server is already set, this cost is already sunk. Second, there is an operational and maintenance cost of the whole e-GP system. This includes operational and maintenance cost (electricity, labor etc.) of running the server, cost for technical support for bug-fixing and system management etc., internet cost, domain maintenance cost etc. Fortunately, the World Bank has already estimated this cost to be \$ 6.2m. We will use this figure as the annual operational and maintenance cost. The present value of lifetime flow of cost is presented in table 1.

Third, in order to make e-GP operational, the pool of public officials using e-GP needs to be trained as well. This training involves not only training of the officials of procurement entities but also other stakeholders like banks and public officials at supplementary agencies like Ministry of Finance,

National Board of Revenue and Bangladesh Public Administration Training Center. Fortunately, most staffs at the target agencies (LGED, BWDB, RHD and REB) as well as the supplementary agencies are almost trained. Only the other using ministries and agencies are being trained. Whereas some officials are being trained, the progress is slow and most officials are yet to be trained. Furthermore, the total number of officials that are being trained on e-GP are not available. Hence, in order to estimate the number of officials to be trained, we looked into the officials who have and will have the authority to procure works items in their time in office. It turns out that only the Class I officers are eligible to make such calls for procurement. Now, the total number of Class I officers in the public sector in 2012 was 117043. With a 1.95% average growth rate (over the past four years since 2008) in public sector work force, the total workforce in the beginning of 2016 can be expected to be 124,024 officers. According to the Aide Memoire 2014, about 2700 officials are expected to be trained through PPRP II, leaving 114,343 officers to be trained. Interviews with public officials reveal that e-GP training designed by the project is a two-day training program that costs 2,760 Taka. We finally assume that the training is to be conducted by the respective agencies and can be completed within two years, half of which is done by the first year and the rest by second. The present value of the two year cost of training is given in table 1.

## V. Benefit to cost Ratios

Table 1 also presents the final benefit to cost ratio. Following Copenhagen Consensus Center's suggestions of using three different discount rates, three benefit to cost ratios are reported. At a 3% level, the benefit to cost ratio is 1,230 suggesting that a 1 Taka investment in e-GP should generate a 1,083 taka return to the economy. This figure is the 317 when the discount rate is 10%.

## V. Concluding Remarks

The electronic public procurement is a new concept around the world. Four government agencies, who are relatively larger in terms of procurement activities, are already implementing it at their fullest capacity. There are other agencies who are taking initiatives as well. This study shows that there is a significant benefit of implementing this despite its potential cost. Hence, the project should be scaled up to all agencies in Bangladesh.

It is also important to note that the estimates provided are very conservative and it is likely that the actual benefit to cost ratio should be higher. For example, anecdotal evidence suggests that the quality of the procured works items have improved which we could not estimate. Second, using e-GP should

be time saving for the public officials and hence, there will be savings in those accounts too. Third, it is assumed that other agencies will start implementing e-GP after two years whereas it has already been started by other agencies and therefore, the benefits of e-GP procured items over 2016 and 2017 were not taken into account. Fourth, utilization of e-GP on goods should generate similar benefits. However, goods procurement was not included in the analysis, inclusion of which would have increased benefits further.



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**Appendix Table 1: Effect of e-GP on Price to Cost Ratio**

VARIABLES	OLS (1)	OLS (2)	OLS (3)	OLS (4)	RE (5)	FE (6)	RE (7)	FE (8)
e-GP	-0.1050*** (0.0097) [-10.8746]	-0.1025*** (0.0095) [-10.8263]	-0.1217*** (0.0134) [-9.1053]	-0.1316*** (0.0126) [-10.4144]	-0.1187*** (0.0116) [-10.2148]	-0.1185*** (0.0117) [-10.1738]	-0.1249*** (0.0111) [-11.2363]	-0.1246*** (0.0112) [-11.1671]
Estimated Cost (million Taka)		0.0000*** (0.0000) [3.0973]	0.0000*** (0.0000) [3.0706]	0.0000*** (0.0000) [3.1390]	0.0000*** (0.0000) [3.3146]	0.0000*** (0.0000) [3.2902]	0.0000*** (0.0000) [3.3518]	0.0000*** (0.0000) [3.3287]
Yearly Trend				0.0165*** (0.0041) [4.0521]			0.0188*** (0.0039) [4.8597]	0.0188*** (0.0039) [4.8243]
Constant	1.0053*** (0.0060) [167.6289]	1.0029*** (0.0059) [169.5624]	0.9786*** (0.0063) [155.0909]	-32.1880*** (8.1892) [-3.9306]	0.9688*** (0.0081) [119.8020]	0.9732*** (0.0062) [157.5161]	-36.7446*** (7.7663) [-4.7313]	-36.8901*** (7.8545) [-4.6967]
Observations	6,651	6,651	6,651	6,651	6,651	6,651	6,651	6,651
R-squared	0.1445	0.1571	0.1809	0.1761		0.1517		0.1490
District FE	No	No	No	No	No	YES	No	YES
Year FE	NO	NO	YES	No	YES	YES	No	No
ll	4986	5035	5131	5111	.	5519	.	5509
Number of districts	65	65	65	65	65	65	65	65

Source: Abdallah (2015). Robust standard errors in first parentheses and t-statistic in second parenthesis. The p-values are indicated as \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Appendix Table 2: Assumptions and other minor calculations made in the analysis**

<b>Benefits Assumptions</b>			<b>Unit</b>	<b>Source</b>
Cost Savings	0.1185			Abdallah 2015
Total Procurement	721509	m	Taka	Progress Report of Annual Development Plan 2013-14
Works Procurement	526933	m	Taka	Progress Report of Annual Development Plan 2013-14
Four Agency Procurement	49958	m	Taka	Central Procurement Technical Unit
Works as a prop of Total procurement	0.730320758			Own Calculations
Four Agency Proc. As a prop. Of works	0.094809017			Own Calculations
Cost Savings at four agencies per year	6715.85139	m	Taka	Own Calculations
Cost Savings at all other agencies per year	52741.67914	m	Taka	Own Calculations
<b>Cost Assumptions</b>				
Hardware Costs at four agencies	93.46652	m	Taka	Procurement Plan V2
Hardware Costs at other agencies (measured by prop. Of works proc)	985.8399812	m	Taka	Own Calculations
Operational & Maintenance Cost	6.2	m	Taka	Aide Memoire 2014
Total Number of Class I officers in 2012	117043			Statistical Yearbook, 2013
Annual mean 4-year growth rate of govt. work force	0.0195			Statistical Yearbook, 2013
Total Number of Class I officers in 2016, estimated	124024.4002			
Training cost per person	2760		Taka	Interview

**Appendix Table 3: Assumptions of Benefit Cost Analysis (If benefits are realized in both goods and works)**

<b>Benefits Assumptions</b>			<b>Unit</b>	<b>Source</b>
Cost Savings	0.1185			Abdallah 2015
Total Procurement	721509	m	Taka	Progress Report of Annual Development Plan 2013-14
Good and Works Procurement	676855.2603	m	Taka	Progress Report of Annual Development Plan 2013-14
Four Agency Procurement	49958	m	Taka	Central Procurement Technical Unit
Works as a prop of Total procurement	0.938110627			Own Calculations
Four Agency Proc. As a prop. Of works	0.073808985			Own Calculations
Cost Savings at four agencies per year	6715.85139	m	Taka	Own Calculations
Cost Savings at all other agencies per year	70276.95793	m	Taka	Own Calculations
<b>Cost Assumptions</b>				
Hardware Costs at four agencies	93.46652	m	Taka	Procurement Plan V2
Hardware Costs at other agencies (measured by prop. Of works proc)	1266.329832	m	Taka	Own Calculations
Operational & Maintenance Cost	6.2	m	Taka	Aide Memoire 2014
Total Number of Class I officers in 2012	117043			Statistical Yearbook, 2013
Annual mean 4-year growth rate of govt. work force	0.0195			Statistical Yearbook, 2013
Total Number of Class I officers in 2016, estimated	124024.4002			Own Calculations
Training cost per person	2760		Taka	Interview

**Appendix Table 4: Benefit Cost Analysis (If benefits are realized in both goods and works)**

Items	In Millions Annual Benefit/Cost	Interest Rate		
		3%	5%	10%
<b>Benefits</b>				
Benefits to Other Agencies	70,276.96	2,208,092.44	1,274,865.45	580,801.31
<b>Total Benefit</b>		<b>2,208,092.44</b>	<b>1,274,865.45</b>	<b>580,801.31</b>
<b>Costs</b>				
Hardware and Software cost in new agencies	1,266.33	1,266.33	1,266.33	1,266.33
Operations and Maintenance Cost	6.20	206.67	124.00	62.00
Training Cost	171.15	337.32	334.16	326.75
<b>Total Costs</b>		<b>1,810.32</b>	<b>1,724.49</b>	<b>1,655.08</b>
<b>Benefits to Cost Ratio</b>		1219.73	739.27	350.92

Bangladesh, like most nations, faces a large number of challenges. What should be the top priorities for policy makers, international donors, NGOs and businesses? With limited resources and time, it is crucial that focus is informed by what will do the most good for each taka spent. The Bangladesh Priorities project, a collaboration between Copenhagen Consensus and BRAC, works with stakeholders across Bangladesh to find, analyze, rank and disseminate the best solutions for the country. We engage Bangladeshis from all parts of society, through readers of newspapers, along with NGOs, decision makers, sector experts and businesses to propose the best solutions. We have commissioned some of the best economists from Bangladesh and the world to calculate the social, environmental and economic costs and benefits of these proposals. This research will help set priorities for the country through a nationwide conversation about what the smart - and not-so-smart - solutions are for Bangladesh's future.

# SMARTER SOLUTIONS FOR BANGLADESH

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## C O P E N H A G E N C O N S E N S U S C E N T E R

Copenhagen Consensus Center is a think tank that investigates and publishes the best policies and investment opportunities based on social good (measured in dollars, but also incorporating e.g. welfare, health and environmental protection) for every dollar spent. The Copenhagen Consensus was conceived to address a fundamental, but overlooked topic in international development: In a world with limited budgets and attention spans, we need to find effective ways to do the most good for the most people. The Copenhagen Consensus works with 300+ of the world's top economists including 7 Nobel Laureates to prioritize solutions to the world's biggest problems, on the basis of data and cost-benefit analysis.