

Assessing Factors Affecting Implementation of the National Building Regulations (L.I.1630) in Ghana

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Abstract

The National Building Regulation (NBR) (L.I. 1630) was enacted in 1996 in Ghana to regulate the erection of buildings, alteration of building structures and execute works or install fittings in connection with any building. Although, this regulation has been enacted, its implementation is questionable. The aim of this research was to assess factors affecting the implementation of the NBR and measures to enhance smooth implementation of NBR in Ghana. Interview and questionnaire survey were the two principal methods used to elicit data from 180 respondents. Three (3) key groups of respondents were targeted for the study, namely local authority staff, building practitioners and building owners. The research findings indicated that the most important factors affecting the implementation of the NBR in Ghana are: corruption; bureaucratic procedures; lack of public education about the building regulations; inadequate resources for implementers; and political interference. The respondents suggest that to deal with the factors affecting implementation of the NBR, there is the need to allow easy access to information on NBR and the use of one-stop shops to improve coordination. Also professionals who compromise the NBR should be sanctioned and then the public should be educated and sensitized about the NBR.

Keywords: national building regulation, implementation, local authorities, Ghana

1. Introduction

Building regulations exist to ensure building work satisfies minimum constructional standards, energy conservation requirements and also ensure the health and safety of people occupying the building (Vonweller, n.d.). In Ghana, the national building regulations (NBR) (L.I. 1630) was enacted in 1996 to regulate the erection of buildings, alteration of building structures and execute works or install fittings in connection with any building.

The perennial flooding, fire outbreaks and occasional collapse of buildings in Ghana in recent times have often been attributed to the fact that the NBR is not been adhered to and normally buildings are developed without a secured approved development and building permit. According to Orgen (2010) there is haphazard development of building structures in reserved spaces, waterways and low lying areas or marshy areas without development and building permits in Ghana. It should be recognized that building regulations are generally the silent protector to the general public and are generally not well recognized (Vonweller, n.d.). According to Dadzie and Coles (2011), the NBR has not made the needed impact due to its poor adherence. Generally building regulations becomes important after large/serious event or disaster (collapse of structures, flooding and fire outbreaks) occurs with extensive life loss.

The aim of this research therefore is to assess significant factors that affect the implementation of the NBR in Ghana. The results of this research will aid government, local authorities, practitioners, builders and policy makers, to identify the actual and significant factors affecting the implementation of the NBR which will in turn influence decisions to formulate relevant policies. The recommendations of this research if complied with will go a long way to mitigate the issue of collapse of structures in Ghana. The issue of domestic fire outbreak will also be curtailed and finally, it will reduce the incidence of flooding especially in the cities.

2. Overview of the NBR (L.I. 1630)

The NBR (L.I. 1630) is a legislative instrument made on the 27th day of September, 1996. This regulation is set of rules and standards that must be followed to satisfy the minimum acceptable levels of safety for buildings and non-building structures. The NBR is applicable to the erection, alteration or extension of any building. L.I. 1630 consists of nineteen (19) parts and one hundred and eighty seven (187) regulations. The District Planning

Authority (DPA) is mandated by L.I. 1630 to implement the regulations on behalf of every local authority. The DPA comprises of heads of relevant departments of the local authority e.g. District Town and Country Planning Manager, Head of District Works Department, District Environmental Health Officer, District Fire Officer, Electricity Company of Ghana District Manager, Ghana Water Company Ltd District Manager etc. The DPA appoints a qualified building inspector who oversees and inspects daily work on buildings, erection and installations to ensure compliance with the requirements of these regulations.

The nineteen parts of the regulations involve: Application of regulations and building plans; Plot development ; Site Preparation and landscape; Materials for building; Structural stability; Structural fire precautions; Access accommodation; Air movement and ventilation; Thermal insulation; Hearths, Chimneys and heat – producing appliances; Sound insulation; Pest control and protection against decay; Drainage; Sanitary conveniences; Refuse disposal; Water supply; Lighting and electrical installations; Special requirements for rural building and; Miscellaneous provisions.

2.1 Building Construction Regulations

Good building construction regulations matters for public safety. It also matters for the health of the building sector and the economy as a whole. According to a recent study, the construction industry accounts on average for 6.5% of GDP in OECD economies (World Bank, 2010). The building sector is Europe's largest industrial employer, accounting for about 7% of employment. In the European Union, the United States and Japan combined, more than 40 million people work in construction. It is estimated that for every 10 jobs directly related to a construction project, another 8 jobs may be created in the local economy. Small domestic firms account for most of the sector's output and most of its jobs (World Bank, 2010).

Striking the right balance is a challenge when it comes to construction permitting. Good regulations ensure the safety standards that protect the public while making the permitting process efficient, transparent and affordable for both building authorities and the private professionals who use it. If procedures are overly complicated or costly, builders tend to proceed without a permit (Agence France Presse, 2006). By some estimates 60–80% of building projects in developing economies are undertaken without the proper permits and approvals. In the Philippines 57% of new construction is considered illegal. In the Arab Republic of Egypt this share might reach 90% (De Soto 2000). In Georgia before the new permitting process that was initiated in 2005, fewer than 45% of construction projects had legal permits.

Where informal construction is rampant, the public can suffer. Take the case of Nigeria, which lacks an approved building code that sets the standards for construction. Many of the buildings erected do not comply with proper safety standards. Without clear rules, enforcing even basic standards is a daunting task. Structural incidents have multiplied. According to the Nigerian Institute of Building, 84 buildings collapsed in the past 20 years, killing more than 400 people (Agence France Presse, 2006). This situation is not quite different from that of Ghana. Overly complicated construction rules also can increase opportunities for corruption. Analysis of World Bank Enterprise Survey data shows that the share of firms expecting to give gifts in exchange for construction approvals is correlated with the level of complexity and cost of dealing with construction permits (World Bank, 2010).

Economies that score well on the ease of dealing with construction permits tend to have rigorous yet expeditious and transparent permitting processes. Speed matters. A study in the United States shows that accelerating permit approvals by 3 months in a 22-month project cycle could increase construction spending by 5.7% and property tax revenue by 16% (World Bank, 2010).

In a 2009 survey of 218 companies in 19 Asia-Pacific Economic Cooperation (APEC) member economies, respondents identified the time and procedures in construction permitting as the biggest “regulatory impediment” to doing business (World Bank, 2010). For many entrepreneurs, building construction regulations are a critical factor when deciding where to establish their businesses. A recent competitiveness report by KPMG indicated that construction costs and the permitting process were among the top 20 factors in determining the location of a start-up in the United States (World Bank, 2010).

2.2 Recent Incidents Involving Collapse of Buildings and Fire Outbreaks in Ghana

Over the last few years, Ghana as a nation has recorded major catastrophes from collapsed buildings and fire outbreaks (Nyan & Koffie, 2012). Some recent incidents involving collapsed of buildings in Ghana are listed below:

- On the 7th November 2012 – Achimota, Accra: A six-storey building which houses Melcom collapsed, trapping a number of people. After the rescue efforts, 81 persons were retrieved and 14 died.
- On the 5th January 2011 – Dormaa Ahenkro, Brong Ahafo: Two persons died on the spot and three others seriously injured, when a two-storey building under construction collapsed on them at Antwirifu, near Dormaa-Ahenkro, in Brong Ahafo Region.
- On the 5th June 2010 – Spintex Road, Tema: A four-storey building situated along the Spintex Road,

near Tema, collapsed-stirring conflicting reports on the number of casualties. While some eyewitnesses said as many as six persons, including a four-year-old boy, could have been buried under the debris, officials of the National Fire Service said only two masons, sustained injuries and had to receive treatment at the Sakumono Hospital

- On the 31st January 2010 – Tarkwa, Western Region: Three persons were killed when part of a five-storey hotel building under construction collapsed on some workers in Tarkwa.
- On the 9th October 2009 – Ashaiman, Accra: Four persons lost their lives when an uncompleted two-storey building collapsed on them at Zenu, a suburb of Ashaiman.
- On the 14th August 2008 – Kejetia, Kumasi: Pandemonium broke out at Kejetia Terminal in Kumasi on Thursday when the middle section of a two-storey building suddenly collapsed. The incident which happened in the afternoon affected 40 stalls and shops. Although there were no casualties, all merchandise in stock were destroyed.
- On the 6th March 2008 – Danyame, Kumasi: A 27-year-old man died on the spot when a two storey building which he and his colleagues were constructing collapsed at Danyame, a suburb of Kumasi.
- On the 15th December 2006 – Asafo, Kumasi: A four-storey office building complex with car park under construction at the O&A Travel and Tour terminal at Asafo-Labour collapsed around midnight.
- On the 13th December 2002 – Accra: Four-storey Building Collapsed in Accra. An observant fire officer saved hundreds of lives in Accra by evacuating a four-storey building moments before it collapsed. The collapsed of the uncompleted building, located near the Central Post Office could have resulted in several deaths and injuries if the fire officer had not organized the evacuation.
- On the 23rd April 2000 – Madina, Accra: Two people were reported missing and 16 others injured, eight of them were serious, when a three storey building they were working on, suddenly collapsed on them at Madina.

In terms of fire outbreaks, Statistics for the first quarter indicated that from January to March, 2012, the Ghana National Fire Service recorded 704 fire outbreaks nationwide and domestic fires were the highest with 206 representing 36.93 per cent (Korli, 2012). The facts on the collapse of structures and fire outbreaks enunciated above corroborate the fact that the NBR is not being implemented effectively in Ghana.

2.3 The Way Forward

Efficient building regulations starts with establishing a coherent body of rules that defines what is required from builders. Today 116 economies around the world including 15 joining this group in the past 7 years have a comprehensive set of building rules, in the form of either a national building code or a law that most fully governs the construction process (World Bank, 2010). Ensuring clarity in these rules is important. When regulations lack clarity and may be subject to broad interpretation, there is a risk that builders and authorities will become confused about how to proceed. This can lead to unnecessary delays, disputes and uncertainty. The adverse effects of ambiguous building regulations can become especially apparent in urban settings as more and more people move to cities and the need for construction of new buildings grows. Since 2007, 50% of the world's population has been living in urban areas, generating more than 80% of global GDP. By 2050 the urban population share is expected to reach 70% (De Soto, 2000)

One example of confusing regulation is the Solomon Islands. The country's national building code has been in preliminary draft form since April 1989. The parliament has not yet enacted the code into law because of differences on how to proceed. In the absence of clear rules, building inspectors can potentially impose additional technical requirements on builders. The ability to engage in such practices can create conditions for some inspectors to extort unofficial payments. Yet having an approved building code does not guarantee uniform implementation. Local authorities may interpret the code differently. The Philippines has had a national building code since 1977, but rules vary substantially among cities. Taguig and Pasig are both part of the Metro Manila area, but their interpretation of which documents need to be notarized and which kinds of buildings need certain inspections is very different (World Bank, 2010). As a result, according to a recent sub-national *Doing Business* report, completing all construction permitting formalities takes 25 procedures and 85 days for an entrepreneur in Taguig but 36 procedures and 148 days for one in Pasig (World Bank, 2010).

Besides being clear, building rules also need to be adaptable so that they can keep up with economic and technological change, particularly important in the light of growing environmental concerns. New Zealand chose an effective approach: performance-focused building codes set targets and overall technical standards but do not regulate how to achieve those standards. This allows room for innovation in building techniques. Overly precise provisions make it challenging to keep regulation up to date. Some building regulations specify what materials can be used in construction. This seems to make sense. The materials are tested for safety, and their technical parameters mandated in the code. But this approach works only when regulations are regularly updated. And they rarely are in the transition economies of Eastern Europe and Central Asia, where such rules are most

common. Construction norms in Ukraine still refer to specific materials that used to be produced in the former Soviet Union. Today these materials are no longer available, so no one can fully comply with the regulations. Flexible rules that are clear and coherent are fundamental to maintaining a safe and vibrant construction sector. Easy access to information on documentation and fees required by building authorities can make compliance with regulations easier and reduce transactions costs for businesses.

In 2012, *Doing Business* collected additional data in 159 economies on the different ways in which building authorities and related agencies make such information accessible. In the majority of the 159 economies covered, understanding which documents are needed to apply for a building permit and obtaining necessary forms requires a meeting with a public official. OECD high-income economies make it easier for businesses. In nearly all these economies information on what is needed to obtain a building permit is available on the internet, in printed brochures or on posters displayed at the building authority or a related agency. In the Middle East and North Africa this is the case in around a third of the economies. In economies where entrepreneurs have access to such information online or through brochures, applications are processed more quickly and building permits granted in less time. In these economies obtaining a building permit and necessary approvals takes 177 days on average. Where an appointment with an official is required, the process takes 199 days on average. Policies promoting access to information cannot on their own increase the accountability of officials and actively counteract corrupt practices. But easier access to the information needed to comply with regulatory requirements is associated with lower transactions costs, lower levels of perceived corruption and stronger voice and accountability mechanisms.

Before a building plan is approved, appropriate clearances are needed to ensure quality and safety. Often several agencies are involved. To prevent overlap and ensure efficiency, many economies have opted to put the agencies in one location. These one-stop shops improve the organization of the review process, not by reducing the number of checks needed but by better coordinating the efforts of different agencies. That way, more resources can be devoted to safety checks rather than to multiple interactions between the client and the various agencies.

In 2010/2011 Mauritania, Taiwan, and China, introduced one-stop shops while Morocco made improvements to the one created in 2006. Yet today only 26 economies around the world have some kind of one-stop shop for construction permitting, including the 15 that established or enhanced one in the past 7 years. One successful example is in Hong Kong SAR, China. In 2009 the local government, as part of its “Be the Smart Regulator” program, merged 8 procedures involving 6 different agencies and 2 private utilities through a one-stop center. A single window facilitates interactions for customers, and today only 6 procedures are needed to deal with construction permits.

In other economies too, more efficient procedures allowed agencies to process greater volumes of permit approvals and increased client satisfaction. In 2006 Burkina Faso was among the 10 economies with the most complex requirements in the world. Not surprisingly, a survey that year found that more than 23% of local companies identified licenses and permits generally as a major constraint to doing business in the economy (World Bank, 2010). To help address this concern, Burkina Faso opened a one-stop shop for construction permits, the Centre de Facilitation des Actes de Construire, in May 2008. A new regulation merged 32 procedures into 15, reduced the time required from 226 days to 122 and cut the cost by 40%.

3. Research Methodology

Questionnaire survey and interview were used to elicit the views of local authority staff, building practitioners, and building owners towards the factors affecting the implementation of the NBR in Ghana. Questionnaires were sent to selected local authority staff in eight districts in the eastern region and building practitioners whereas interview schedule was used to elicit the views of building owners with building development permits. 120 questionnaires were distributed among local authority staff and building practitioners whereas interview was conducted among 60 building owners with development permits. In all, 180 respondents participated in the study. The details are presented in table 1.

The respondents were asked to indicate, based on their experience the level of importance of each of the identified factors affecting implementation of the NBR on a five-point Likert scale as: not important, slightly, moderately, very, and extremely important. The respondents in the group of the local authority staff were coordinating directors, planning officers, town and country planning managers, engineers, technician engineers and building inspectors with average experience of 14 years. The respondents in the group of building practitioners were construction project managers, architects, civil/ structural engineers, and private builders with average experience of 18 years in the construction industry.

The factors believed to affect the implementation of the NBR were considered in this study based on a preliminary interview conducted amongst experienced local authority staff and building practitioners. Measures to enhance implementation of the NBR were also considered in the preliminary interview. The purpose of the preliminary interview was essentially to validate a preliminary set of implementation factors from some

connoisseurs and to determine from their experience other factors which affect the implementation of the NBR in Ghana. To ensure a balanced view, the interview consisted of 10 each of local authority staff and building practitioners. This approach was adopted for the reason that literature in this domain was lacking. This phase resulted in the identification of the factors affecting the implementation of the NBR and measures to enhance implementation of the NBR. The second stage involved the development of questionnaire and interview schedule incorporating the implementation factors and measures to enhance implementation of the NBR identified.

The relative importance index method (RII) was used herein to determine local authority staff, building practitioners', and building owners with building development permits' perceptions of the relative importance of the identified factors affecting implementation of the NBR. The RII was computed as:

$$RII = \frac{\sum W}{A \times N}, \dots \dots \dots (1)$$

Where:

- RII = Relative importance index;
- W = the weight given to each factor by the respondents and ranges from 1 to 5;
- A = the highest weight = 5;
- N = the total number of respondents (Enshassi, Mohamed, & Abushaban, 2009).

To determine whether there is a significant degree of agreement among the 3 groups of respondents (local authority staff, building practitioners and building owners), Kendall's coefficient of concordance was used as a measure of agreement among raters. Kendall's coefficient of concordance indicates the degree of agreement on a zero to one scale, and is computed by the following equation (2):

$$W = \frac{12U - 3m^2n(n-1)^2}{m^2n(n-1)}, \dots \dots \dots (2)$$

Where:

- $U = \sum_{i=1}^n (\sum R)^2$,
- n = number of factors;
- m = number of groups;
- i = the factors 1, 2... N (Frimpong, Oluwoye, & Crawford, 2003; Enshassi, Mohamed, & Abushaban, 2009).

Null hypothesis: H0: There is significant degree of agreement among local authority staff, building practitioners and building owners.

Alternative hypothesis: H1: There is insignificant degree of agreement among local authority staff, building practitioners and building owners.

Mean scores and standard deviation were also used to analyze the responses on measures to enhance implementation of NBR.

4. Results and Discussion

Relative Importance Index

Table 2 illustrates the significant factors affecting the implementation of the NBR in Ghana. It can be gathered from table 2 that the five (5) most important factors according to the perception of local authority staff, building practitioners, and building owners are: corruption; bureaucratic procedures; lack of public education about the building regulations; inadequate resources for implementers; and political interference.

Corruption obtained the highest average rank among all the factors. It was ranked by the building owners in the first position with relative importance index (RII) equal to 0.953. Also, it was ranked by building practitioners in the first position with RII equal to 0.948, while local authority staff ranked it as the fourth most important factor with RII equal to 0.906. Building Owners and building practitioners perceived that the most important factor that affects the implementation of the NBR is corruption. It is disheartening to note that building owners interviewed admitted that application for building permit is at times delayed as a result of kickback not being paid to some implementers. According to the respondents, there are situations where monies paid as kickback was higher than the official money paid with receipt. This practice thwarts the smooth implementation of the NBR.

As indicated in Table 2, bureaucratic procedures was ranked by building owners as the second most important factor with RII equal to 0.937. It was also ranked by building practitioners in the second position with RII equal to 0.945 whereas it was rated by local authority staff in the fifth position with RII equal to 0.898. This factor was very important to the building owners and practitioners probably because they have had personal experiences and observed that the procedure needs to be streamlined. According to the respondents, the permit

application goes through numerous offices, inspections and signatures which lead to a very cumbersome procedure. The respondents observed that this factor deters the public from obtaining development and building permit before putting up their building.

All the three groups observed that lack of public education about the regulations strongly affect the implementation of the NBR. According to the respondents, some members of the public are not even aware they have to obtain building permit before commencing building development. Those who are aware also do not know the importance of obtaining building permit before developing their building.

Inadequate resources for implementers have been rated by the local authority staff in the first position with RII equal to 0.978 whilst building practitioners ranked it as the fourth most important factor with RII equal to 0.926. It was ranked by building owners in the fifth position with RII equal to 0.873. It was not astounding to realize that inadequate resources for implementers is the most important factor for local authority staff because local authorities remarked that they are not able to implement the NBR because they lack resources.

Political interference was ranked by local authority staff in the second position with RII equal to 0.970. Also, it was ranked by the building practitioners in the fifth position with RII equal to 0.919 whilst it was rated by building owners as the sixth most important factor with RII equal to 0.837. This factor was also important to the local authority staff for the reason that they remarked passionately that political heads usually interfere with the implementation of the NBR. They also intimated that they most times lack the will to empower them to implement the regulations.

In order of importance, the significant factors affecting the implementation of the NBR in Ghana agreed by the local authority staff, building practitioners, and building owners are: corruption; bureaucratic procedures; lack of public education about the building regulations; inadequate resources for implementers; political interference; inadequate personnel; unavailability of highly experienced personnel; Lack of qualified personnel; Lack of commitment by central government; and ambiguities of some part of the national building regulations.

4.1 Degree of agreement analysis

To determine whether there is a significant degree of agreement among the 3 groups (local authority staff, building practitioners, and building owners) Kendall's coefficient of concordance was used as a measure of agreement among raters. For all the factors, the p-values (Sig.) are greater than $L = 0.05$ (L is the level of significance), the null hypothesis, H_0 , is not rejected. Thus, it can be said that there is an insufficient evidence to support the alternative hypothesis, H_1 . Therefore, it can be said that there is a significant degree of agreement among the local authority staff, building practitioners and building owners regarding factors affecting the implementation of the NBR by local authorities in Ghana.

4.2 Measures to Enhance Implementation of NBR

In the opinion of the practitioners, the first three most important measures to enhance implementation of the NBR as presented in figure 1 are 'sanctioning professionals who compromise the NBR', 'Using one-stop shops to improve coordination' and 'establishing of fund by local authorities for implementation of NBR'. Other equally important measures to enhance implementation of the NBR are 'Allowing easy access to information', 'education and sensitization of the public about the NBR', 'Setting clear and coherent regulations', training existing staff and employing adequate staff' and 'reviewing existing regulations'. All the measures assessed in the study have mean scores greater than 2.5 (Field, 2005) and therefore considered significant and important for enhancing the implementation of the NBR.

5. Conclusion

The results indicated that corruption was the most important implementation factor as it has the highest average rank among all the factors. Local authority staff, building owners and building practitioners perceived that the most important factor that affects the implementation of the NBR is corruption. The most important factors agreed by the local authority staff, building practitioners, and building owners as the main factors affecting the implementation of the NBR in order of importance were: corruption; bureaucratic procedures; lack of public education about the building regulations; inadequate resources for implementers; political interference; inadequate personnel; unavailability of highly experienced personnel; Lack of qualified personnel; Lack of commitment by central government; and Ambiguities of some part of the national building regulations.

Kendall's coefficient of concordance was used to determine, whether there is a degree of agreement among implementation factors for local authority staff, building practitioners, and building owners. For all the factors, there is a significant degree of agreement among the local authority staff, building practitioners, and building owners. This is because all local authority staff, building practitioners, and building owners are concerned with these factors. The first three most important measures to enhance implementation of the NBR according to the respondents are 'sanctioning professionals who compromise the NBR', 'Using one-stop shops

to improve coordination’ and ‘establishing of fund by local authorities for implementation of NBR’.

The paper thus recommends that the implementation system should be restructured to identify implementers who compromise the regulations as a result of their selfish interest. Such persons should be sanctioned to deter others from compromising with the regulations. This will help resolve the issue of corruption in the system. Local authorities should also streamline the implementation process such as the procedure for obtaining building permits to reduce the bureaucracy. This will mitigate the issue of bureaucracy in the system. Local authorities and government agencies ought to also formulate programs to educate and sensitize the public about the purpose and importance of the NBR and the need to cooperate with implementers. There is the need to establish or set aside a special fund by all local authorities to provide resources for the implementation of the NBR. This will assist to solve the issue of inadequate resources. Local authorities must continuously train their existing staff, employ sufficient personnel who are experienced and qualified. There is the need to also review the national building regulations and streamline certain aspects of the regulations. The review of the regulations should include some emerging areas such as energy efficiency, accessibility to all and environmental sustainability.

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Table 1: Percentage of questionnaire distributed/ interview conducted and responses received

Respondents	Questionnaires Conducted	Distributed/Interviews	Responses Returned	Percentage of Responses
Local Authority Staff	55		54	98.18%
Building Practitioners	65		62	95.38%
Building Owners	60		60	100%
Total	180		176	97.78%

Table 2: Relative Importance Index and Rank of Implementation Factors according to the 3 Groups

Factors(Affecting Implementation)	Local Authority Staff		Building Practitioners		Building Owners	
	RII	Rank	RII	Rank	RII	Rank
Lack of public education about the national building regulations	0.963	3	0.939	3	0.900	4
Bureaucratic procedures	0.898	5	0.945	2	0.937	2
Corruption	0.906	4	0.948	1	0.953	1
Political interference	0.970	2	0.919	5	0.837	6
Inadequate knowledge of the regulations by implementers	0.696	10	0.848	11	0.783	9
Inadequate resources for implementers	0.978	1	0.926	4	0.873	5
Unavailability of highly experienced personnel	0.607	12	0.900	7	0.910	3
Lack of qualified personnel	0.630	11	0.887	8	0.793	8
Inadequate personnel	0.870	6	0.906	6	0.807	7
Ambiguities of some part of the national building regulations	0.801	7	0.858	10	0.660	12
Lack of commitment by local authorities	0.767	9	0.842	12	0.670	11
Lack of commitment by central government	0.793	8	0.868	9	0.687	10

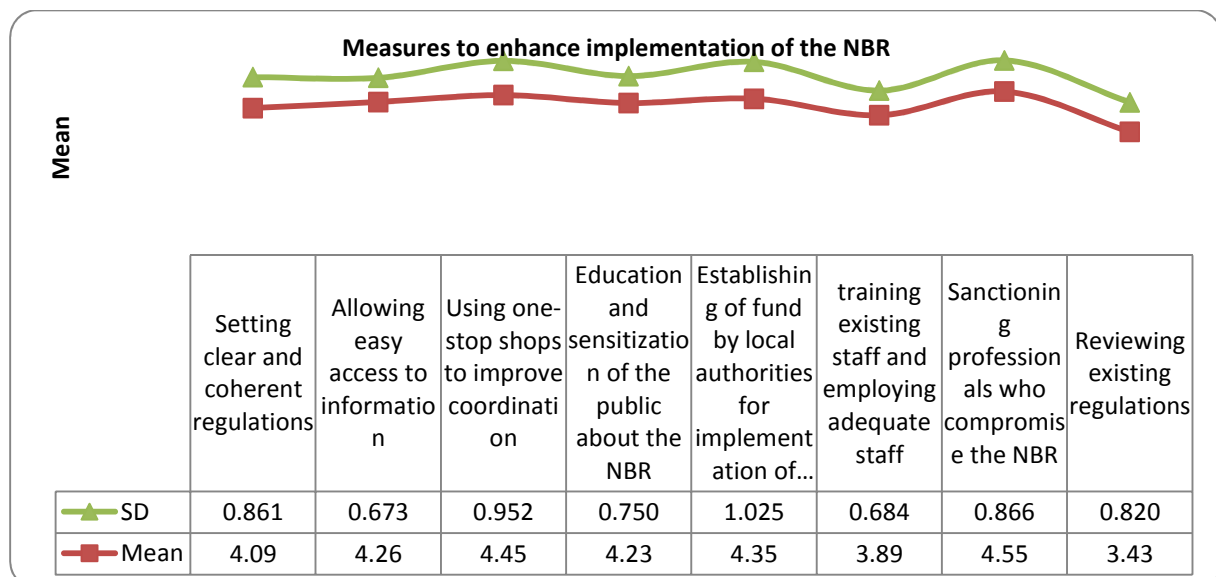


Figure 1: Mean scores of measures to enhance implementation of NBR

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