

Risk and Uncertainty Management of Projects: Challenges of Construction Industry

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Abstract

The Developing Countries are, because they are yet to develop the stock of their infrastructure. To develop the stock of infrastructure, the construction industries are pivotal and are the conduits. The challenges of sustainable development of developing countries are the challenges of development of stock of infrastructure. Subsequently, the challenges of development of stock of infrastructure are the challenges facing the Construction Industries.

The effective development of infrastructure through constructions, are issues of growing concern, satisfaction and study. One of the challenges to optimum construction is risk and uncertainty that project faces, due to evolving and emerging conditions through the project lifecycles, organisations and environment. To avoid construction projects from running out of control, optimise the deliveries of projects and to strengthen business positions, there is need for an effective and deliberate approach to risks and uncertainties management.

The paper introduces and discusses the concept of risk and uncertainty and their effect on construction projects management as one of the challenges facing Construction Industry in Developing countries. It concludes by advocating for systematic approach to risks and uncertainties management as the optimal prerequisite for Construction Industries to overcome the associated challenges.

Keywords: *Risks, Uncertainties, Challenges and Construction Project management.*

INTRODUCTION

The role and contribution of the Construction Industry are pivotal and the primary conduits for infrastructure development and maintenance. In construction industries and the various project stages, one of the silent day to day realities are risks and uncertainties. And construction industry is inherently risky and uncertain and these arise from the nature of the industry itself. These are faced due to evolving and emerging conditions through project lifecycles and project environmental circumstances. They are generally due to physical, economic, social and political circumstances *inter alia* with resources available and the project characteristics at hand.

Risks and uncertainties characterise all activities be they in production, services and exchange. They affects all the fundamental variables that determine planning, implementation, monitoring, adjustment, behaviour and explain choices, and bring about decisions. Patrick Chan (1990), observed that, in all fields the future remains uncertain and risky. James Esau Okema (1999), argued that, risk and uncertainty is the threat of variability, instability and lack of knowledge of events and activities; and lack of appropriate technology to

handle the events and activities. And that project risks and uncertainties are results of both exogenous and endogenous factors.

Knut Samset (1998), argued that, the main forces behind development is man's desire to manage uncertainties. He asserted that, the ancient struggle to conquer enemies and the transformation of nature to culture by applying technology is about managing uncertainties. This is to make food supply reliable, the habit safe and comfortable; work tolerable, transport and communication reliable, sickness curable, etc. The levels of predictability and stability of things in the developed countries are much better than in developing countries. And for the developing countries to develop, they need to increase the levels of predictability and stability. From this, one can suggest that, the level of risks and uncertainties as a whole could be used to determine the level of development of a country and developing countries are, because of the level of risks and uncertainties prevailing in general terms.

There is little evidence of application of risks and uncertainties management in construction in developing countries and yet it is apparent how they influence the course of construction projects and poses immense challenges. This should be of particular concern in developing countries because they need every coin and accelerated progress to propel them to develop. Therefore, to reduce the challenges of the Construction Industry and improve the role and contribution of the industry, to sustainable development of developing countries, it is great potential to focus more, than ever before, on the concept of risk and uncertainty. This should be covered through both theoretical and practical approaches at operational, strategic and development level. This shall promote construction project from running out of control, and optimise the deliveries of projects through strengthen business activities. The theoretical approach should be able to support the development of knowledge in the areas of risks and uncertainties, while the practical approach should be able to spread the benefits of the knowledge to bear results through various skills and techniques.

This paper concerns itself with the matter of risks and uncertainties as one of the challenges in construction industry in developing countries. It introduces and discusses the concept of risk and uncertainty and their effect on construction projects management. It uses various illustrations to explain the effect of risks and uncertainties. And to put the matter in a construction project management context, one road project has been discussed as a case study. Thereafter, it is pointing out that, the management of risks and uncertainty could be improved with great potential in construction industry in developing countries and advocates for systematic approach to their management in construction industry specifically and in the developing countries as a whole.

Principles of management of risk and uncertainty

There is no clear cut, definition of risk and uncertainty. Many scholars look at it from different perspectives. However, it is generally agreed that, in risk and uncertainty, the outcome or activities are likely to depart from expectations. It is considered that, the effect of the deviation from expectation could be Value-Neutral, Value-Negative or Value-Positive. In construction Industry project management, these values are in the form of Time, Quality and Economy of the project. Therefore, in construction project management, it is the effect of risks and uncertainties on project time, quality and economy that is the subject of management and management development.

In dealing with risks and uncertainties management as challenges facing construction industry in developing countries in project management, the focus should be on:

- Identification of the various risks and uncertainties that the project faces.
- Categorisation and Quantification of risks and uncertainties that the project faces.
- Risk and uncertainty sensitivity analysis for the project.
- Project risks and uncertainties allocation and distributions to those with better capacity and mechanism to handle each categorisation. This may include the traditional allocation to God/gods through prayers or by ignoring the risks and uncertainties. Sometimes, some people handle it in superstitious manners

either through fortune-tellers or witchdoctors or traditions for example sacrifices of some kind for certain type of projects. Risks and uncertainties allocation and distribution should be done through terms and conditions of contracts.

- Project risks and uncertainties response and mitigation by the responsible people or parties to whom they were allocated and distributed. So that when the threats occur partially or wholly, the project implementation is protected from their consequences or compensated for the consequences.

The fundamental bottom line of principles of management is that risks and uncertainties are not entirely negative but also holds significant opportunities that their proper management could be very much rewarding. It is this double edge notion of risks and uncertainties that is the benefit of the management challenge in Construction Industry. This is also the only managerial attitude that makes the management approach comprehensive, relevant and optimal.

PRACTICAL RISKS AND UNCERTAINTIES ILLUSTRATIONS

For presentation purpose, a generally elective approach to Ugandan's situation is being covered below with one case study of a road project. While the Uganda's case may not be a representative of all the developing countries, it is hoped that, the issues considered highlights the challenges of risks and uncertainties across the board and give practical examples that have similar nature in most developing countries, if not all.

Macro-Economic Risks and Uncertainty

In macro-economic management, the concept of risk and uncertainty is looked at from the perspective of stability and instability in the economy. The key areas of risks and uncertainty for the project management are:

- Terms of trade especially exchange rate. One of the characteristics of developing countries is that Terms of Trade is not in their favour. Most developing countries import quite a lot of construction materials, equipment and machinery for use in the construction industry, and balance of payment instability that can occur due to sharp fall in terms of trade can pose serious risks and uncertainties to projects. This could include scarcity of supplies. For example, Petroleum Products in Uganda, see Table 1 below. From January 1994, the fuel prices were liberalized and the prices quoted are average pump prices. There was a surprise increase between January and May 2000. In the road project, of Repair of Kaseses – Fort Portal and Equator Roads, the variation of prices was about US \$ 94, 000. This was due to increase in the cost of some specified materials, particularly with the cost of transportation of lime between August 1997, to October 1998 on a contract of about US \$ 5 million. In another project, Rehabilitation of Kafu-Karuma Road, the variation of prices amounted to about US \$ 1.5 million of contract sum of about US \$ 18 million between October 1994 to April 1997. In the case of improvement of Kampala – Entebbe Road, the variation of prices amounted to about US \$ 450, 000 on a contract sum of about US \$ 4.5 million between February 1996 to October 1997. From these three project sited, the total variation is about US \$ 3 million, which could have built either a school or health centre.

<i>Time frame</i>	<i>Jan</i> <i>'92</i>	<i>Jan</i> <i>'93</i>	<i>Jan</i> <i>'94</i>	<i>Jun</i> <i>'95</i>	<i>Jan</i> <i>'96</i>	<i>Jan</i> <i>'97</i>	<i>Jan</i> <i>'98</i>	<i>Jan</i> <i>'99</i>	<i>Jan</i> <i>'00</i>	<i>May</i> <i>'00</i>
Petrol	740	920	890	915	980	1160	1 170	1 150	1 305	1 375
Diesel	600	770	820	785	870	1 070	1 000	920	1 095	1 125
Kerosene	570	700	710	700	700	860	810	780	905	935
Exchange rate	970	1 065	1 113	965	1 018	1 045	1 148	1 369	1 526	1 580
(Shs/US \$)										

Table 1: Pump Prices for Selected Petroleum Product Ug. SH per litre, Kampala (Source: Ministry of Energy)

- The impact of inflation is a source of instability and poses risk and uncertainty to project management. It is well known that inflation erode the real value of money and act as a deterrent to holding and saving money. This brings about price instability that can occur due to a rise in the rate of inflation. In Uganda, in 1985, the annual inflation was standing at about 240% and in April 2000; it is 2% according to Uganda Bureau of Statistics. It is this kind of macro-economic management that earned for Uganda a name especially with the Multi-lateral and Bi-lateral donors and development agencies.
- The fiscal deficits factors of instability. In developing countries, governments are still the largest employers in construction industry and the budgetary or fiscal instability because of a rise in government deficit, is a direct risk and uncertainty in project management. In Uganda by June 1999, the debt owed to the private sector was amounting to U.Shs. 261 billion, (Approximately US \$ 188 Million). A sizeable part of this debt stock is owed to contractors, Material suppliers and consultants in Construction Industry. Due to this kind of risks and uncertainties associated with Government payment and budget deficit, some people would not attempt at all, in Uganda, to bid for jobs that are mainly finance by Government without major international donor support.

INSURANCE INDUSTRY RISKS AND UNCERTAINTY

In construction project, there is the essence of performance guarantee, insurance of goods, of works & workers, of equipment, etc. as a way of mitigating risk and uncertainty. In Uganda, due to poor performance of the insurance industry, the Ministry of Works, Transport and Communication, which is the single largest construction employer do not accept Insurance bond and instead instituted bank guarantee requirement for advance payment. There is also an allegation that poor performance of a certain foreign contractor on the extension of the Owens Fall Dam, at the source of the Nile has wipe out an insurance company, the underwriter of performance bond for the contract. And yet the loss the client suffered has not yet been fully mitigated. This was a demonstration of market wide problem of approaches to risks and uncertainties management.

Site production risks and uncertainties

In construction project management, the quality and efficiency of site production is what determine the success of the project management. At the site the condition are always very difficult to accurately determine and plan accordingly. Harsh weather patterns, labour unrest, equipment breakdown, unpredictable physical condition of the site, poor site management, poor engagement of skills and manpower, poor selection of equipment and understanding of the design, etc. are real problems that posses various risks and uncertainties to site production. The risks and uncertainties also include accident and injuries on site. For example, due to the recent boom in the Uganda economy and increased construction activities and poor health and safety practices, the rate of death and destruction on sites have increased to an alarming level. On July 13, 2000, two brothers died instantly, where they were buried alive in a pit latrine they were digging at a school within Kampala City. A tearful witness narrated that "I saw it. It was a small crack and I tried to shout to them. One of them raced to the other side near his colleague but it was all too late." On January 14, 2000, five workers were instantly electrocuted at Uganda Leather and Tanning Industries in Jinja Town and sixth narrowly survived when a colleague pulled him out from the pit of death. These are some of those many fatal accidents on construction site where lives have been lost and without hope of proper compensations.

Natural calamities risks and uncertainties

There are various natural calamities that effect risks and uncertainties in construction of unprecedented natures. The effects of these natural calamities emanate from natural calamities like flood, weather, earthquakes, etc. In Uganda, one can site two main calamities as examples. [a], El Nino in 1998, that affected the whole of East Africa. These affected many project implementations either through direct impediment or indirect related effect like destruction of supply routes and causing delays of deliveries.

Through El Nino Emergency Road Repair project Credit No 3064-UG, the World Bank offered approximately US \$ 30 million to Uganda to address the effect of the calamities. [b] The earthquake of 1994, in western Uganda with an epicenter at Kisomoro, Kabarole District, devastated areas in Kabarole and Bundibugyo district which are earthquake-prone areas. Eight people died in the earthquake and the damage to property was estimated at US \$ 60 million. Just like many other developing countries, Uganda does not have any coherent policy and action strategy to deal with these kind of natural calamities, even with the effect of those calamities. Yet, there is no guarantee that those calamities shall not repeat again and soon.

Bureaucracy and corruption risks and uncertainties

In construction project management, there are challenges faced due to factor of bureaucracy and corruption associated risks and uncertainties. While bureaucracy and corruption is not any monopoly of developing countries, its negative value effect is more devastating in developing countries. Due to corruption tendencies and some time the way the issues are being tackled, it poses various risks and uncertainties as challenges to project management. Some people either deliberately create bureaucracy bottlenecks to attract bribe for themselves or create bureaucracy 'red tape' to protect themselves from corruption allegations. It depends on how these approaches to bureaucracies are handled; they can pose various risks and uncertainties as challenges for the project management. As reported in a daily News Paper in Uganda, *The Monitor*, July 31, 2000 Anti-Corruption Supplement, average investor in Uganda loses upto 40% of expenses in bribe and over 40% of the people in over 18,000 household had paid a bribe to obtain a public service. This means that one does not get services consistently or as expected. In the daily News Paper *The Monitor*, business page, January 21, 2000, it was reported that, construction and arms industries lead business sectors with the greatest propensity to pay bribes to government officials in emerging market economies (developing countries), according to the leading anti-corruption organisation, Transparency International [TI]. This was base on in-depth interviews with more than 770 business executives, lawyers, accountants, bankers and officials of chambers of commerce in 14 leading emerging market countries.

Contract and contractual performance risks and uncertainties

Most if not all construction projects are managed through some kind of contract and expected contractual performance. These introduces into project management another aspects associated with it and subsequently associated risks and uncertainties. There are challenges that the client may pay or not or partially, timely or not. From clients perspectives, the contractor may perform or not and to take a performance bond does not even guarantee the contractual performances. For example, in Uganda, like it may be in other developing countries, payment from government is most uncertain and riddle with various bureaucratic red tapes. Late payment from client causes cash flow problems for contractors and often results into intermittent work. In one of the project, Kumi-Serere-Soroti road, the amounted interest on late payment by May 1999 was about US \$ 7,000.

Project risk and uncertainty due to public demand

In democracies or even in non-democracies, the voice of the public can not be ignored and this is increasing becoming critical the world over. In Uganda to date, no major project is implemented without Environmental Impact Assessment, which are subjected to public hearings. There, at the public hearing, any project can be rejected due to adverse public impact. The construction of the first private hydroelectric generation station at the Nile at Bujagali falls, in Uganda, is facing serious risks and uncertainties of survival. This is due to environmental campaigners and the demand of the people to be displaced by the dam construction. Another type of example of project risk and uncertainties due to public demand is associated with earlier performance of the firm. In the Business column of a daily NewsPaper, *The Monitor*, July 27, 2000, one Chinese business firm China Civil Engineering Construction Corporation (CCECC) was reported complaining that their business plans are being maligned. This is because another Chinese firm called SIETCO, failed to complete the Owen Falls Dam extension project at the source of the River Nile. In the daily News Paper, *The New Vision*, July 29, 2000, it was reported that, Environmentalists have sued Golf

Course Holdings Limited in an attempt to secure a permanent injunction restraining the proposed construction of a hotel on Plot 64 – 84, Kitante Road, Kampala. They were claiming that, the mandatory Environmental Impact Assessment [EIA] carried out by the defendants was irregular and would like to have it declared null and void. These kind of public pressures for the project management are bound to increase as developing countries get more democratised and sensitive. Therefore, project management shall increasingly face challenges of risks and uncertainties associated with public demand.

Political and insecurity risks and uncertainties

One of the distinct features of the developing countries is the political and insecurity problems they face. These vary in nature, complexity and characteristics from countries to countries. They can also be of mainly national nature like it is in Burundi, Ivory Coast, Nigeria or partially nationally and international like in Uganda, Sudan, Democratic Republic of Congo, or mainly of international nature like between Eritrea and Ethiopia. Many construction projects in developing countries faces risks and uncertainties of various natures associated with political and insecurity problems. A particular example in Uganda is Telecommunication House a Multi-story office block, in the center of Kampala City, which was under East Africa Community and many other projects. Following the collapse of the East Africa Community, the project faced various risks and uncertainties. For the Communication House, it had to stall for over fifteen years. The road case study presented later shows also the effect of insecurity amongst others.

Donor associated risks and uncertainties

Most Developing Countries are supported and continue to be supported by the donors. and a sizeable part of the support goes to construction industry. In Uganda, donor support accounts for more than 20 % of the Gross Domestic Product per capita. A considerable amount up to 50% of the support goes to the Construction Industry, a case that could be common in many other developing countries with various degrees. The risks and uncertainties associated with donors are of various natures, ranging from instability in their countries to conditionalities of their support and the shift in their focus. For example in the recent political change in Austria; there was a Cultural Centre for Ndere Foundation in Kampala, which they were funding and the project is facing financial support risks and uncertainties. The recent election brought in government a team with attitude against support to developing countries and the subsequent, cut in development support assistance which is affecting the above project. Uganda since 1986 has been having very good relation with donors as seen from the above level of support, however, due to Uganda's involvement in Democratic Republic of Congo, there have been warning signs. These is giving a sense of uncertainty because, should Uganda continue to be involved in Democratic Republic of Congo and donor take actions of withholding their support, serious business uncertainty shall be exhibited for those in Construction Industry.

QUALITY OF CONSTRUCTION RISKS AND UNCERTAINTIES

In many developing countries, there are lack of national standards and quality specifications. Enforcement of regulations is not consistent. The results are that construction materials are produced below standards. There is also associated capacity and competency problem of labour force in developing countries affecting the attainment of quality. In Uganda on the December 28, 1999, Ministry of works Housing and Communications through the Permanent Secretary [PS] issued a press release for the public caution against use of sub-standard construction materials on the market. The PS pointed out that, for sometime there were general outcries from the public regarding the quality of some construction materials in use countrywide. This had been substantiated by reported and documented cases of structure e.g. Public buildings, school blocks, offices, residential units, bridges, etc collapsing/failing in almost every District. The incidents had often regrettably resulted into loss of lives and properties. Technical audits overwhelmingly pointed at poor workmanship and/or use of inferior materials as the main causes of such failures.

CASE STUDY OF MOYO- ATIAK ROAD (NORTHERN UGANDA)

Introduction:

Description	Details
Date of tender	29.06.1993
Date of award	17.05.1994
Date of Engineer's Order to Commence	25.05.1994
Original Commencement date	24.06.1994
Revised Commencement date	13.12.1994
Time of Completion	200 days
Original completion date	10.01.1995
Revised Completion date	01.07.1995
Maintenance Period	6 months
Contract Price	Ushs. 6,666,802,501 (US \$ 6.35 Million)

Table 2: Moyo-Atiak Road Initial Contract Status Summary

The Government of Uganda has been facing armed conflict in Northern Uganda. In early 1990s, the situation improved and Government of Uganda initiated reconstruction and development of the war damaged region and instituted Northern Uganda Reconstruction Programme (NURP) with financial assistance from the World Bank. The highway component of NURP covered other roads including the Moyo-Atiak Road. The client for the contract was Government of Uganda, the Consulting Engineer was GIBB (East Africa) Limited and the contractor was China Sichuan International Co-operation Company Limited (SIETCO). This case study documentation is based on a report presented in January 1998 by the Consultant to the client representative. After the project had stalled due to risk and uncertainty factors of mainly insecurity due to attacks by rebels and lack of prior project management strategies that considered them. It is particularly chosen because it is a classical case of how risks and uncertainties can affect project time, costs and quality management. Also because, it is an example that despite the glaring risks and uncertainties that the project was going to face, there was no project management focus on it. And the contract had to be terminated due to the client (Government) budget deficit, that could not allow the project to be completed.

The contract awarded to SIETCO had the details as indicated in the table 2 above. The works was mainly to gravel-surfaced road and built associated drainage requirements. By February 24,1996, the contract execution was not yet finished, work covered was about 50% and progress was suspended by the contractor through invoking the relevant clause in the terms and conditions of contract. Construction of the works was at various stages but no section was substantially completed. Plant and equipment were left on site. The client on, February 10, 1997 gave assurance that security had been restored in the project area and gave instructions that the works should be started again.

An assessment to examine the state of the plant, materials and other facilities which had been abandoned on site, and the likely cost of completing the outstanding works and deterioration that had occurred in the unprotected and uncompleted works was done in March 1997. It also included out standing payment to the contractor. There were contractual claims including those connected with the stoppage of works and price adjustment. The contractor was unable to resume the works unless he was paid and rehabilitated his plants and equipment abandoned on site. The consultant's details of the outstanding payments to the contractor were given to the employer in June 1997.

Contractor termination:

Following receipt of the consultants recommendation on outstanding claims, the employer reached an agreement with the contractor to pay part of the outstanding claims so that the contractor could resume the works. The contractor re-mobilised his resources to site during August 1997 and early September 1997 whilst awaiting the payment of the interim certificate. By early November 1997, it became clear that payment of the above interim certificate would not be forthcoming from the employer. On November 11, 1997 the contractor therefore invoked his remedies for non-payment under the clause of the conditions of contract to terminate the contract and in December 1997 terminated the contract.

Progress:

A site inspection was conducted in January 1998 involving representatives from the World Bank, Ministry of Works, Transport and Communications, and the consultants. The site inspection revealed that, the contractor had withdrawn all his plant, equipment and some materials from site; some sections of the completed gravel-wearing course had deteriorated further; and bush had covered side drains in most sections of the completed works. At this stage, the stand was that, the political leadership in Uganda would like the outstanding works on the Moyo-Atiak road completed as soon as it is possible through the most efficient solution either by SIETCO or by other contractors. However, the Government of Uganda recognised that, outstanding payments, connected with standing time during the period of stoppage due to insecurity in the project area, are owed to SIETCO and they were unable to pay these outstanding amounts immediately due to budgetary constraints.

Challenges:

SIETCO was requested, whether they could again re-mobilise resources to the site for the execution of the outstanding and remedial works. They agreed on the conditions that; all outstanding issues including two other road contract of NURP for which the contractor was working for should be finalised, outstanding certificates paid and all submitted claims, on all the three contracts are verified and paid. The contractor also stated that all his plant and equipment were in Kampala, about 390 km away from the site, en-route to China. Some of the expatriate staff had already left for China and the rest were scheduled to leave Uganda. However, a detailed site survey would be necessary to accurately assess the full extent of such remedial works. The cost of outstanding works at the original contract rates is valued at approximately US \$ 3.7 million, which were about 50% of the initial contract sum.

As the earlier contract had been terminated, the contract rates were unlikely to be applicable, and it was expected that the actual cost of completing the works is likely to be considerably higher. The outstanding certificates and evaluated claims up to August 1997, amounted to about US\$ 2.5 million. This amount excluded the costs of claims connected with the termination of contract under clause of the condition of contract. Additional claims connected with the termination submitted plus others amounted to a total of US\$ 4,982, 340.62. The conditions of contract also allowed for the re-imbursment of the costs of repatriating staff and equipment and the final amount of claims were likely to be higher. It is even considerably higher if one put in consultant fees and the cost of the clients and financier in continuing to run the project.

Options for the completion of the works:

Two options were available for completing the outstanding and remedial works. The first option was to enter re-negotiations with SIETCO and the second is to re-tender the works. The advantages of completion of the works by SIETCO were that, SIETCO was familiar with the project and would be willing to work in the project area despite the perceived insecurity. They still had adequate plant in the country (Kampala yard) to complete the works. They could mobilise in a reasonably short time. And by retaining SIETCO, the Government of Uganda could negotiate a comprehensive agreement covering both the outstanding claims

and completion of the works. The disadvantages were that, SIETCO's resumption of the works would most likely be tied to the finalisation and payment of all outstanding claims, including the costs of the re-mobilisation and demobilisation of staff and equipment. This could take quite some time and SIETCO were unlikely to agree to carry out the outstanding works at terminated contract rates.

The advantages of re-tendering were that, the outstanding issues, claims and payment on SIETCO's contracts could be dealt with separately from the completion of the outstanding works. A new tender with updated quantities and new rates would remove the terminated contract that was 5 years old to then prevailing situations. The disadvantages of re-tendering were that, SIETCO would most likely pursue the settlement of their outstanding dues with more vigour and possibly involving arbitration and/or Litigation. This could end up being costly to the Government of Uganda. And a new tendering process would have to be undertaken involving the preparation of new documents, pre-qualification of contractors, tendering period evaluation award, mobilisation which would result in some delay to the re-commencement of the work. The new tenders were likely to result into considerably higher rates than those in SIETCO's contract were.

Pre-qualification and revision of tender documents	70 days
Approval by International Development Agency [IDA]	20 days
Tendering Period	60 days
Evaluation of Tender	60 days
Approval of evaluation by Tender Board/IDA	30 days
Negotiation, award formalities	30 days
Construction period	180 days
Total Estimated Period	450 days (15 months)

Table 3: The expected timetable for re-tendering estimated by the consultant

Therefore a project that should have got finished by July 1, 1995 could either have been finished by SIETCO in September 1998 or by another contractor at least in May 1999. There were already costs overrun, of huge amount. At one stage the contractor asked for risk allowance from the client but the client rejected it and they claimed that, the government would provide security without contractual obligations.

COMMENTS

Right from the inception of the project through design tendering and contract implementation, there were glaring risks and uncertainties. However, there was no scientific focus on the problem. Everybody concern gloss over the problem not that they are incompetent or negligible, but because the concept of scientific approach to risks and uncertainties is not yet entrenched in construction project management in Uganda and possibly in most developing countries. This case study is pointing to more than the eye can tell and critical analysis shows how far developing countries need to focus on risks and uncertainties both in management of society and projects. Many often it is the insurance industry that thrives on the scientific approach to risks and uncertainties mitigation management and focusing people's mind on the matter. However, in Uganda just like in many developing countries, insurance industry, which had public monopoly and inefficiency is not one of those to depend on and they are themselves at infancy stage.

CONCLUSION

The concept of risk and uncertainty is a fundamental of the development of the developing countries. The developing countries should focus in making living and things less risky and more certain. Risks and uncertainties as challenges of construction project management is a fact that, all those involve in one way or another needs to grapple and interface with seriously. Risks and uncertainties are not synonymous with failure and losses, thought they pose great project management challenges. They offer both threats and

opportunities. It is a concept where outcome of events and activities deviates from expectations and these expectations in construction project management are in the form of Time, Quality and Economy of the project.

As seen from the few selected illustrations and the case study, risks and uncertainties are real challenges of construction industry and in project management. They are both factored by endogenous and exogenous circumstances. As illustrated above, the key fundamentals of risks and uncertainties are the human factor, information, communication and technology. The general challenges are to have a sensitive human attitude backed up with capacity and competency. The human sensitivity, capacity and competency should be equipped with appropriate technology, information and communication capacity. These should enable systematic approach to risks and uncertainties management as the optimal pre-requisite for Construction Industries to overcome the associated challenges. This should also enable continuous improvement of risks and uncertainties management with great potential benefits in construction industry and sustainable development of developing countries.

While the various illustration and the case study has demonstrated the matter of risks and uncertainties in construction project management, the thrust of this paper is the concern for little, if any, the adoption of focussed scientific risks and uncertainties management approach in construction industry in developing countries. It is apparent that what brings about claims for project time extensions, cost escalations and compromises project qualities are associated with the concept of risk and uncertainty. Therefore, to improve the management of challenges in Construction industry, to improve construction project deliveries and to promote efficient and quality use of resources in construction in developing countries, there should be a systematic development and utilisation of risks and uncertainties management knowledge, skills and techniques. This shall enable construction industry to play their rightful and necessary role and contribution to sustainable development of developing countries.

RECOMMENDATION FOR RISK AND UNCERTAINTY MANAGEMENT IN PROJECTS

- 1- Recommended General Principles of Risk and Uncertainty management.
 - All possible risk and uncertainty should be identified, assessed, analysed and distributed amongst the parties involved or those that can get involved according to their capacity, competency and characteristics.
 - Allocation and distribution of the various risks and uncertainties to those that can handle them better should be done through terms and conditions of contract.
 - Monitoring, evaluation, response and mitigation by those assigned by terms and conditions of contracts.
- 2- The consultants and the contractors should be under legal, professional ethics and code of conducts to point out project risks and uncertainties to their clients and advise the clients on the possible course of actions.
- 3- The recommendation for dealing with the macro-economic risks and uncertainties is the promotion and support of prudent macro-economic management. This is in the domain of devaluation and trade liberalisation to care for balance of payment deficit; promoting market force to operate to fix prices and remove the excess demand and inflation; and reduction in public sector deficit. Many developing countries, which have adopted some good and prudent macro-economic including Uganda, have registered some good degree of management of macro-economic risks and uncertainties. There should be also, deliberate efforts to influence the development of insurance industry in developing countries to promote risks and uncertainties mitigation.
- 4- Each firm should develop risks and uncertainties management policies, guidelines and procedures applicable to their respective practices. One of these should focus on the capacity and practices for increasing the stock of corporate information, capacity to logically and correctly interpret them, use them and communicate them to the appropriate points or persons. Another one should include human

resource development in the areas of risks and uncertainties management. This is to support more, especially, managerial and strategies development for Consultants and Contractors.

- 5- There should be more focus on the concept through research, teaching in institutions of higher learning, collaboration and dissemination of information about risks and uncertainties, their effects in construction industries and how to appropriately management them. For International Council for Research and Innovation in Building and Construction, CIB, a special Task Group on Risks and Uncertainties in Construction could be established to focus more attention on the matter.

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