



NATIONAL CONSTRUCTION
AUTHORITY

NATIONAL CONSTRUCTION RESEARCH AGENDA (NaCRA 2020)



NATIONAL CONSTRUCTION RESEARCH AGENDA (NaCRA 2020 - 2024)

SECOND EDITION

Published by:

National Construction Authority,
9th Floor, KCB Towers

P. O. Box 21046 - 00100, Nairobi, Kenya

Telephone: +254-709 126 102/172/173

E-mail: info@nca.go.ke

<http://www.nca.go.ke>

ISBN: 978-9914-9856-1-0

All Rights Reserved Copyright©2021

This report can be found at

Extracts may be published if the source is duly acknowledged

First printing, 2015

Second Printing, 2021

Table of Contents

Preface	ii
Acknowledgments.....	iv
Acronyms	vii
Executive Summary	viii
Chapter One: Introduction.....	1
Chapter Two: Recommended Research Areas	4
Chapter Three: Resource Mobilization for NaCRA.....	28
Chapter Four: Monitoring and Evaluation	29

PREFACE

The Construction industry in Kenya continues to make significant contribution to the economy of the country through the development of buildings and infrastructure valued at more than \$1.2 billion. The National Development Agenda "Big 4 Agenda" coupled with Vision 2030 projects postulates heavy investments in the foreseeable future. These investments may not over emphasize the importance of the sector in the country's economy.

The unique nature of construction activities has resulted in a deep multi-sectoral entanglement. This entanglement has caused several cross-cutting challenges that hinder development of quality construction products and formation of specialized trades. For these reasons, conducting research has been identified as sure way of innovatively developing solutions for the industry. The Authority has developed the National Construction Research Agenda (NaCRA) to spearhead research in the construction industry and provide local solutions. NaCRA targets partnership framework to allow and encourage research amongst practitioners in the construction industry. In 2014, the Authority commissioned NaCRA 2014-2017 and identified 17No. research areas towards improving the construction industry. The Authority appointed a special committee to review NaCRA 2014-2017 on 18th April 2019. The committee established that the industry has successfully addressed fifteen (15) thematic areas. This reflects 88% level of success in addressing the entire identified NaCRA thematic areas.

These improvements can also be attributed in part to the research and activities of the National Construction Authority. The special Committee was composed of persons with diverse backgrounds who have worked in academia, government, industry, and labour unions. To complete its tasks, the committee worked diligently, convening a series of meetings and also employing conference calls and e-mail correspondences. The committee engaged the stakeholders who gave valuable input to the Agenda and this culminated in the coming up with NaCRA 2020-2024. NaCRA 2020-2024 takes cognizance of the following; Kenya Vision 2030; the Big 4 Agenda; and international development blueprints such as AU agenda 2063-'The Africa we want', UN sustainable development goals among others.

Despite many obstacles, the committee noted that NaCRA is important tool for developing the research attitude in Kenya construction industry and have come up with NaCRA 2020-2024 that will form the basis of researches till 2024.

QS. David M. Gaitho
CHAIRMAN, NCABOARD

ACKNOWLEDGEMENTS

The National Construction Authority (NCA) through its Research, Business Development and Capacity Building Department, with the support of the Industry stakeholders, coordinated the evaluation and review of NaCRA (2014-2017).

The following institutions participated in the evaluation and review process ; State Department of University Education & Research, State Department of Vocational and Technical Training, State Department for Housing and Urban Development, Kenya Building Research Centre, State Department for Public Works, Institute of Quantity Surveyors of Kenya (IQSK), Institution of Construction Project Managers of Kenya (ICPMK), Kenya Law Reform Commission (KLRC), University of Nairobi (UON), Kenya Property Developers Association(KPDA), Institution of Surveyors of Kenya (ISK) and Kenya National Bureau of Statistics (KNBS).

The Authority would like to extend profound thanks to the committee members and for their effort to the evaluation and review process of this Agenda. It was composed of the team leader Dr. Ing. Christopher Mbatha (Chairperson) UoN, Dr. Edwin Oyaro (Vice-Chairperson) UoN, Dr.(Eng.) Anthony G. Kihuga - State Department for Public Works), Arch. Oliver Okello - KBRC, Ms. Faith Rotich - KLRC, Ms. Susan Kamau - KLRC, Qs. George Charles Omondi- State Department for Housing and Urban Development, Mr. Mark.O.Kenyatta- ICPMK, Archbishop Titus Zakayo Ingana- State Department of University Education & Research, Mr. David Ng'ang'a- State Department of Vocational and Technical Training, Qs. Jordan Opiyo - IQSK, Mr. Vincent Mwangi - KPDA, Mr. Charles Obiero - State Department of university Education, Mr. Isaac Ndeqwa-KNBS, Mr. Wafula Nabutola - ISK Qs. Susan Rutto - NCA, Eng. Raymond Karani- NCA, Mr. Paul Gesora- NCA, Mrs. Christine Kirimi - NCA, Arch. Stephen Mwilu - NCA, Eng. Stephen Nyakondo - NCA, Mr. Christopher Khaoya - NCA.

Members of the technical Secretariat: Stella Chami, Marion Kiranka, Kevin Okemwa, Maureen Mutanu, Benson Kimathi (all of NCA).

Special thanks to the Authority's General Manager CR, BD, T&CB - Qs. David Mathu for the effective leadership and coordination in the delivery of this important National Agenda.

Eng. Maurice Akech
EXECUTIVE DIRECTOR / REGISTRAR OF CONTRACTORS

ACRONYMS

ABMT	Alternative Building Material Technology
ADR	Alternative Dispute Resolution
AFDB	African Development Bank
CM	Construction Management
CPM	Construction Project Management
NCA	National Construction Authority
NaCRA	National Construction Research Agenda
KBRC	Kenya Building Research Centre
UoN	University of Nairobi
ICORCE	International Construction Research Conference
ICT	Information and Communications Technology
IQSK	Institute of Quantity Surveyors of Kenya
IFC	International Finance Corporation
ICPMK	Institution of Construction Project Managers of Kenya
KLRC	Kenya Law Reform Commission
KPDA	Kenya Property Developers Association
ISK	Institution of Surveyors of Kenya
KNBS	Kenya National Bureau of Statistics
SDG	Sustainable Development Goal
SME	Small Medium Enterprise
ToR	Term of Reference
TVET	Technical and Vocational Education and Training

EXECUTIVE SUMMARY

The broad mandate of NCA is to oversee the construction industry and coordinate its development. The Authority is further mandated to conduct or commission research in the construction industry, disseminate research findings and establish a construction industry information system. Research has been and remains pivotal to the gains realized in the past and into the future of the construction industry.

Kenya has participated in global and regional partnerships to conduct cutting-edge research which have generated ground-breaking findings that have informed local policy and practice. Gaps exist, with slow uptake of research findings. There has in the past existed no national guidance on research priorities against which researchers can develop questions and undertake investigations or partners align funding and other resources. Consolidation of research for accessibility to stakeholders, tracking of on-going studies and dissemination of results has increasingly become essential to fast track translation of relevant research results into policy and practice.

This Research Agenda addresses these gaps and further provides guidance on key interventions to address the practical elements of strengthened research coordination, implementation, dissemination and uptake. It takes cognizance of existing mechanisms for quality control including ethics review committees, outlines capacity development options for research, reviews and data analysis and embraces the use of technology to facilitate availability of research findings to programmers, policy makers, students, implementers and communities.

The country's development blueprint, Kenya Vision 2030 has identified the construction industry as one of the key drivers towards actualization of the vision's objectives in political, social and economic developments in Kenya.

CHAPTER ONE: INTRODUCTION

The National Construction Authority (NCA) is a state agency in Kenya established by the National Construction Authority Act No 41 of 2011 with an overall mandate to oversee the construction industry and coordinate its development. One of the Authority's key functions is to undertake or commission research into any matter relating to the construction industry. Under research, the Authority is mandated to:

- Undertake or commission research into any matter relating to the construction industry and disseminate research findings to the stakeholders;
- Encourage the standardization and improvement of construction techniques and materials;
- Maintain a construction industry information system;
- Provide consultancy and advisory services with respect to the construction industry.

Towards the realization of this mandate, NCA launched the National Construction Research Agenda (NaCRA) for the period 2014-2017. The Authority has been carrying out research based on priority areas published in NaCRA. NaCRA is a stakeholder driven process initiated by NCA to identify and prioritize gaps and challenges that need to be recorded. The setting of research priorities is guided by principles of stakeholder participation; inclusivity and need for answers to the identified priority gaps or/and challenges.

The wider objectives of NaCRA are thus:

- To highlight gaps and current issues affecting the construction industry.
- To dialogue and present ideas for a more effective research in the construction industry.
- Provide an opportunity to bring together researchers with policy makers, professional institutions and other construction industry stakeholders at a national level.
- To investigate the institutional means to better support research in the construction industry.

The Authority strategic plan is inspired by the long-term development blueprint for the country, which is the Kenya Vision 2030, whose aim is to create a globally competitive and prosperous country with a high quality of life by 2030. The Authority research activities are aimed at enhancing infrastructure development which is key sector in realization of this vision. Globally, the NaCRA report is aligned to the SDGs, with special emphasis on Industry, Innovation and Infrastructure and Sustainable Cities and Communities.

Since its inception, the Authority has achieved the following in terms of research:

- Research policies and procedures in place
- International linkage with important construction players
- Formulation of National Construction Research Agenda (NaCRA)-driven by NCA, academic and research institutions
- The International Construction Research Conference and Exhibition (ICoRCE)
- Baseline skills survey in the construction industry conducted
- Mapping of technical training institutions conducted
- Baseline studies in plant and equipment's carried out
- Past university research papers on construction matters availed for industry utilization
- Model for funding of SME contractors developed by NCA and IFC/World bank
- Capacity Assessment Study of local contractors ongoing with AFDB assistance

In pursuit of this, NCA has been organizing the International Construction Research Conference and Exhibition (ICoRCE), an international platform that allows individual researchers, research institutions and/or universities to discuss their research outcomes and innovations with the industry players. ICoRCE is a critical platform which assists the Authority and the country at large in the formulation of industry policies, making Kenya a model construction business hub in the region and beyond. ICoRCE is the biggest conference of its kind in the region, an outcome of the National Construction Research Agenda.

Majority of the priority areas in the inaugural Agenda have been addressed. There was a need to review the Agenda due to emerging issues in the construction Industry spectrum. The Special Committee was guided by below-stated Terms of References (TORs).

- Evaluate and review NaCRA 2014-17
- Develop an implementation strategy for reviewed NaCRA

It is essential to carry out the review of the Agenda to help identify research gaps in the previous research priorities and continue to build a platform for future work.

CHAPTER TWO: RECOMMENDED RESEARCH AREAS

This section presents the key recommended research areas which were identified as key research areas for Kenya. Within each of these technical disciplines, priorities topics are articulated in-order to express the rationale.

The table below shows summarized priority areas.

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
1. CONSTRUCTION TECHNOLOGY AND MATERIALS				
1	Digitization and Automation of Construction in Kenya	a. To assess the socio-enviro-economic impact of ICT application on constructions in Kenya	a. Reduced construction cost	Source of funds expected from Development partners
		b. To enhance productivity and efficiency by leveraging on ICT programs and platforms.	b. Promote a quality built environment	
		c. To assess the barriers to digitization & automation programs on construction projects in Kenya and recommend appropriate strategies	c. Increased innovations in construction	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
2	Suitability and adoption of local/indigenous construction materials	a. To establish opportunities for adoption of Appropriate Building Materials and Technologies (ABMT) with special focus on innovative housing and construction Models/Designs	a. Facilitate attainment of housing demand	Source of funds expected from Development partners
		b. To establish the suitability of the following indigenous Vernacular/Cultural construction materials such as Makuti, thatch, Mud (Maasai hut), volcanic ash, quarry dust and white coral stones.	b. Policy frame work and guidelines on standardization and utilization of locally available and imported construction materials and technologies.	
		c. To establish the utilization of local & composite materials in the construction industry in Kenya with special on achieving functionality and sustainability.	c. Increased use of composite materials that guarantees functionality and sustainability in the construction industry.	
3	Industrialized systems for construction components	To establish effective models for mechanization of construction materials and components production.	a. Enhanced adoption of emerging trends in programs in construction projects	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
4	The use of alternative and emerging technologies for construction products in Kenya	a. To establish the suitability of the following alternative construction technologies for AHP; 1) laying ground floor slabs without excavation in unstable grounds or deep soils, 2) EPS systems in response to seismic actions and acoustic properties 3) white coral stones among others.	a. Guidebook on available Appropriate Building Materials and Technologies (ABMT) in the country.	Source of funds expected from Development partners
		b. To illustrate a comparative analysis between traditional and emerging construction materials, technologies and systems.	a. Enhanced adoption of emerging trends in construction projects.	
		c. To illustrate the life cycle costs pertaining to current, innovative and emerging materials and technologies for resilience and sustainability.	c. Greater understanding of life cycle costs pertaining to current. Innovative and emerging materials and technologies.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
5	Standardization and approval mechanisms for building materials, components, equipment, technologies and systems.	a. To establish the level of standardization of construction materials, components, equipment, technologies and systems for conventional quality assessment in Kenya.	a. Enhanced Standard of Construction Materials & Equipment	Source of funds expected from Development partners
		b. To determine the adoption of Eurocodes, British standards, Indian standards or Kenyan standards in the construction industry in Kenya.	b. Increased awareness on adoption of Eurocodes, British standards, Indian standards or Kenyan standards in the construction industry in Kenya.	

2. CAPACITY DEVELOPMENT

6	The effectiveness of NCA training & capacity building programs	a. To assess the impact of NCA training programmes in the construction industry	a. To guide in the improvement of relevance, quality and content of the NCA training programmes for contractors, site managers' /site supervisors and construction workers.	GOK/NCA budgetary allocation
---	--	---	---	------------------------------

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
		<p>b. To assess the impact of NCA training programmes on contractors, site managers'/site supervisors and construction workers.</p> <p>c. To establish the extent of skills transfer into and from Kenya.</p> <p>d. To determine the modalities of exportation of construction services.</p>	<p>b. Framework to improve the training content</p> <p>c. Framework for skills transfer into and out of Kenya.</p> <p>d. Framework for exportation of construction services.</p>	
7	The preparedness of higher learning institutions to undertake requisite training of skilled manpower for the construction industry.	<p>a. To assess the effectiveness of higher learning institutions to adapt emerging trends in construction.</p> <p>b. To assess the relevance of the current curriculum vis-a-vis the required competencies and emerging trends in construction.</p>	<p>a. Flexibility in programmes by learning institutions that takes cognizance of emerging trends in construction.</p> <p>b. To guide in the improvement of relevance, quality and content of the programmes.</p>	GOK/NCA budgetary allocation

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
		c. To establish a link between Training and industry needs.	c. Appropriate linkages between training institution and the industry stakeholders.	
		d. To determine opportunities for collaboration to empower TVET and Universities graduates who undertake Disciplines in the construction industry.	d. Empowerment of TVET and Universities graduates who undertake Disciplines in the construction industry.	
		e. To establish the extent of collaboration and linkages between TVETs, Industry and Government.	e. Collaborations and linkages between TVETs, Industry and Government.	
8	The interaction between human skills and technology in the Construction Industry	a. To investigate the extent of mechanization of construction processes in Kenya	a. Increased awareness on mechanization of construction processes in Kenya	GOK/NCA budgetary allocation
		b. To ascertain the technological/skill diffusion between foreign and local firms	b. Formulation of guidelines & Policies on skill/technological transfer/diffusion	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
9	Feasible capacity building methods for construction entities	a. To assess the extent of community/stakeholder awareness on the emerging trends in technologies	a. Increased stock of knowledge transfer and awareness.	GOK/NCA budgetary allocation
10	Capacity of local contractors to undertake public projects.	a. To investigate the factors that determine contractors participation in a public construction projects	a. Increased interest in public construction projects.	GOK/NCA budgetary allocation
		b. To investigate the causes for stalled public projects.	b. Mapping of stalled public projects.	
		c. To ascertain the Impact of foreign contractors on development of capacity of local contractors"	c. Higher productivity of local contractors.	
3. CONSTRUCTION MANAGEMENT				
11	The management of specialized contract works in construction projects in Kenya.	a. To examine the main contractors coordination performance on project performance	a. Addressing of coordination challenges amongst contractors & Consultants working on the same project.	GOK/NCA budgetary allocation

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
		b. To assess the managerial competencies of domestic contractors in comparison to industry expectation	b. Initiatives to build managerial capacity of local contractors.	
12	Investigation of the current construction project management practice and its impact to quality of construction products in Kenya	a. To assess the impact of contractor's site management practices for construction projects in Kenya	a. Enhanced site management practices	Source of funds expected from Development partners
		b. To assess the extent of adoption of management tools and techniques in construction projects in Kenya	b. Better contractor's site management practices.	
		c. To examine the effect of current construction procurement systems on projects performance	c. Suitability selection procurement criterion	
		d. To examine the client & contractor relationship factors for construction quality management	d. Management tools and techniques	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
13	The role of socio-economic factors on project performance	To assess the impact of social-economic factors on project performance	Social-economic factors affecting project performance	Source of funds expected from Development partners
14	Institutionalization of Construction Project Management (CPM) and Construction Management (CM) practices	<p>a. To identify the opportunities for leveraging Construction Project Management (CPM) and Construction Management (CM) practices in Kenya</p> <p>b. Investigate the effect of non-institutionalized CPM & CM practices on performance of projects</p> <p>c. To evaluate the extent of adoption of CPM and CM practice in Kenya</p> <p>d. To establish the availability index for construction project managers</p>	Better understanding and adoption of Construction Project Management (CPM) and Construction Management (CM) practices in Kenya.	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
4. RISK & SAFETY MANAGEMENT				
15	The Risk Assessment and Management practice for construction projects in Kenya.	a. To establish a need and justification for mainstreaming risk assessment/analysis in construction projects' planning, implementation and management.	a. Policy framework on risk management in construction industry	Source of funds expected from Development partners
		b. To identify, classify and measure risks in construction projects.	b. Proper measurement of risks in construction projects.	
		c. To recommend, develop and advise on the appropriate and cost-efficient risk mitigation mechanisms and strategies in regard to construction projects.	c. Adoption of appropriate and cost-efficient risk mitigation mechanisms and strategies in regard to construction projects.	
		d. To determine the relationship between construction period and size of project (cost per m ³).	d. Efficiency in project delivery timelines.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
16	Integrated Disaster and Risk Management (IDRM) and preparedness on construction sites in Kenya.	To establish the level of disaster awareness and preparedness in the construction sites in Kenya.	Policy on Integrated, Disaster and Risk Management (IDRM) and preparedness on construction sites and during use.	Source of funds expected from Development partners
17	Construction Failures	<p>a. To identify, classify the causes of construction failures and recommend policy interventions in addressing the failures.</p> <p>b. To establish a framework for Audit and inspections of construction projects in Kenya</p> <p>c. To assess the extent and prevalence of substandard, risky and dangerous construction structures in Kenya.</p> <p>d. To establish the relationship between quality of locally manufactured construction materials and the collapse of buildings.</p>	<p>a. Identify causes of construction failures and develop mitigations measures.</p> <p>b. Policy framework for Audit and inspections of construction projects</p> <p>c. Mapping of prevalence of substandard, risky and dangerous construction structures</p> <p>d. Adherence to building code (regulations) in regard to performance of locally manufactured building materials.</p>	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
4. RISK & SAFETY MANAGEMENT				
18	The state of occupational safety and health in the construction industry.	a. To assess the level of awareness and observance of safety and health measures in construction sites in Kenya.	a. Enhanced awareness and observance of safety and health measures in construction sites in Kenya.	Source of funds expected from Development partners
		b. To evaluate the management options of occupational hazards in the construction industry. Such as Insurance, and compensation for injuries and fatalities.	b. Guidelines on the management options of occupational hazards in the construction industry.	
		c. To evaluate the adequacy, relevance and enforcement of laws, regulations policies and guidelines on safety and health in the construction industry.	c. Improved adherence to laws, regulations policies and guidelines on safety and health in the construction industry.	
19	The maintenance and functionality of construction products (infrastructure and buildings).	a. To ascertain suitability, convenience, comfort and functionality of construction products for use especially by people with physical disabilities and the elderly.	b. Enhanced awareness and adherence to laws, regulations and policies dealing with maintenance of infrastructure and buildings	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
4. RISK & SAFETY MANAGEMENT				
20	Risks associated with COVID-19	a. To investigate the level of preparedness for construction practitioners against force majeure conditions such as COVID-19, terrorism etc.	a. Resilient construction practitioners who are better placed to deal with force majeure conditions such as COVID-19, terrorism etc	Source of funds expected from Development partners
		b. To ascertain suitability and applicability of current legal framework on Force majeure conditions.	b. Appropriate legal framework on Force majeure conditions.	
		c. To investigate the long-term socio-economic impact for COVID-19 to the construction industry supply chain and its coping mechanisms.	c. Ameliorate the long term socio-economic impact for COVID-19 to the construction industry supply chain.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
5. ENVIRONMENTAL ISSUES				
21	The climate change and geological/ecological/social-cultural characteristics for the construction industry in Kenya.	a. To assess the impact of climate change and geological/ecological/social-cultural characteristics to the construction industry and the built environment.	a. Promote environmentally friendly construction methods	Source of funds expected from Development partners
22	Sustainable methods for harvesting natural resources for construction purposes.	a. To identify and illustrate sustainable methods for harvesting natural resources such as sand and timber for construction purposes.	a. Promote environmental conservation	Source of funds expected from Development partners
		b. To determine the level of adoption of environmentally friendly systems	b. Appropriate infrastructure and buildings designed and developed to suit areas which are geologically fragile and environmentally sensitive.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
23	Emerging trends that relate to climate change resilience like smart cities, railway cities, university cities, green buildings and intelligent buildings.	a. To determine the level of awareness and challenges in adoption of climate change resilience technologies such as smart cities, green buildings and intelligent buildings in the Kenya.	a. Cleaner environment	Source of funds expected from Development partners
		b. To determine the impact of landscaping activities on the air circulation, sound quality and visual aesthetics	b. Clean/conducive environment	
		c. To ascertain the level of use of renewable energy in construction processes and systems in Kenya.	c. Saving on energy	
24	Waste management practices in the construction.	To establish the effectiveness of current waste management practices and propose improvements.	a. Skills development in environmental clean systems by Youth who can be either self-employed or have sellable skills from development of Bio-digesters in all counties b. Improved Hygiene	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
25	Imported construction materials, technologies and their impact to the domestic construction industry.	a. To establish the factors leading to over-reliance on imported construction materials & technologies for construction projects in Kenya	a. Reduced reliance on imported construction materials & technologies for construction projects in Kenya	Source of funds expected from Development partners
		b. To evaluate and enhance local productivity of construction materials and components.	b. Improved productivity levels of local manufacturers/producers of construction materials and components.	
		c. To determine the quality of imported materials	c. Reduction in importation of poor quality and sub-standard construction materials.	
26	Protected Areas, heritage zones & Monuments.	a. To assess the preservation, conservation and restoration practices.	a. Well preserved and protected properties & heritage zones	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
6. CONSTRUCTION ECONOMICS				
27	The access of affordable construction finance, machinery, materials and equipment by local practitioners.	<p>a. To determine the level of access of affordable construction machinery, materials and equipment by local contractors,</p> <p>b. To evaluate and enhance the access of affordable construction machinery, materials and equipment by local contractors.</p> <p>c. To evaluate and enhance the access of affordable construction financing by local contractors.</p> <p>c. To illustrate a comparative analysis of owning and hiring construction machinery, equipment by contractors as means of project capitalization.</p>	<p>a. Cost effective arrangements of access to construction machinery, materials and equipment through purchase or leasing.</p> <p>b. Affordable construction financing.</p> <p>c. Better understanding of costs associated with ownership or leasing of construction machinery equipment by contractors.</p>	Source of funds expected from Development partners.

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
28	The status of growth and development of construction industry in Kenya.	a. To investigate and leverage on the opportunities for the development of local contractors	a. Growth and development of local contractors.	GOK/NCA budgetary allocation
		b. To establish the Impact of foreign contractors on Kenya's construction industry" The case of Chinese & Somali Contractors.	b. Enhanced skills transfer to local contractors by foreign contractors.	
		c. To determine the issues that negatively affect the construction industry and their reasons for occurrence.	c. Mitigation arrangement for factors that negatively affect the construction industry in Kenya.	
		d. To investigate factors that influence the contractor registration trends in Kenya	d. Framework of registration of contractors.	
		e. To establish the effectiveness of the site Supervisors and construction workers accreditation scheme	e. Framework for accreditation of site Supervisors and construction workers	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
		f. To determine the Performance of the local contractors and issues affecting their growth”	f. Policy intervention in addressing the challenges experienced by local contractors	
		g. To explore possible opportunities to be exploited by NCA to contribute towards the expansion of the GDP.	g. Enhanced contribution of the construction industry to the GDP.	
29	Investigate the efficacy of current construction contract payment processes.	a. To establish the factors leading to delay in payments for construction projects	a. Weakness and solutions in existing payment processes	GOK/NCA budgetary allocation
		b. To determine synergetic influence of delay in payment on project quality		
		c. To identify and illustrate best practices and standards on financial risk management in construction projects	c. Financial risk management matrix	
30	Project finance mobilization for construction projects	To assess challenges of cost and access experienced by developers in mobilizing financial resources for project implementation.	Affordable project finance.	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
7. LEGAL AND REGULATORY FRAMEWORK				
31	Harmonization of construction industry laws	a. To determine the effect of several construction and built environment laws on the construction industry in Kenya.	a. Recommendation on the harmonization of over 100 construction and built environment laws.	Source of funds expected from Development partners
		b. To assess the extent of fragmentation of the construction industry legal framework and propose a framework for harmonization of construction laws.		
32	Alignment of existing construction industry laws and regulatory framework to the Kenya constitution 2010.	a. To identify deviations of existing laws from the Constitution of Kenya, 2010 and propose alignment.	a. Robust legal framework	Source of funds expected from Development partners
		b. To assess the socio-economic impact of the current legal framework on the construction industry.	b. Functional and orderly built environment.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
7. LEGAL AND REGULATORY FRAMEWORK				
33	To investigate the implementation of built environment development laws, regulations, policies and guidelines.	a. To investigate the application and relevance of conditions of construction contracts	a. Guidelines in regard to construction contracts.	Source of funds expected from Development partners
		b. To assess challenges of enforcement of development control laws.	b. Improved adherence to development control laws	
		c. To review legal mechanisms of collaboration among government agencies in the construction sector	c. Reviewed legal mechanisms of collaboration among government agencies in the construction sector.	
		d. To assess the effectiveness for the national frameworks on local contents in the construction industry	d. Guidelines on the enforcement of local content in the construction industry.	
34	Climate change, environmental management and sustainability of the construction industry.	a. To assess the impact of construction in Kenya on climate change and develop mitigation measures.	a. The environmental & social implementation frame work.	Source of funds expected from Development partners

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
		<p>b. To assess the effects of the regulatory framework on the sustainability of the construction industry.</p> <p>c. To assess levels of awareness, adaptation and compliance to environment law and best practice protocols.</p> <p>d. To assess the effects of the regulatory framework on the sustainability of the construction industry.</p> <p>e. To assess the effectiveness for the national frameworks on local contents in the construction industry</p>		
35	Awareness and adoption of Alternative Dispute Resolution (ADR) mechanisms in the contract process (planning, design, construction and maintenance of construction projects	a. To assess the effectiveness of ADR mechanisms in resolving disputes/conflicts in the construction Industry	a. Increased adoption of ADR in resolving disputes/conflicts in the construction industry.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
36	Transitional challenges from graduate status to professional in the construction industry	a. To assess the effectiveness of professional development practice for built environment practioners in Kenya	Increased transition from graduate to professional status for built environment practitioners.	Source of funds expected from Development partners
		b. To assess the availability index for built environment practioners in Kenya		
37	Investigate development of public private partnerships & joint ventures in construction projects and its impact to project delivery.	a. To explore the synergetic role of politics in project delivery processes in PPP & Joint venture construction projects in Kenya.	a. Effect of politics in project delivery processes in PPP & Joint venture construction projects in Kenya.	Source of funds expected from Development partners
		b. To assess weaknesses in public-private partnership projects that impede uptake of construction projects by domestic contractors.	b. Awareness on building capacity for domestic contractors in order to effectively participate in PPP projects.	
		c. To explore ways of raising development and project finance by mobilization through options such as pension funds, Unclaimed assets funds and construction material manufacturers.	c. Improved access to development and project finance.	

S. NO	RESEARCH AREA IN ORDER OF PRIORITY	OBJECTIVES OF RESEARCH AREA	IMPACT/OUTCOME	FUNDING REQUIREMENT
8. CONSTRUCTION AND POLITICS				
38	Investigate the value systems and ethical practices in the Construction Industry	To assess weaknesses in project management processes in construction that actuate malpractices.	a. Safe /Quality Built Environment b. Develop mitigation measures	Source of funds expected from Development partners
39	Managing political influence in the initiation, planning, execution and closure of construction projects.	To explore the role of political leadership in construction project execution	Reduced corruption	Source of funds expected from Development partners
40	Investigate the enviro-socio-economic impact of politics on project implementation in the construction industry (Research could focus on sector specific infrastructure projects i.e., water - dams and water systems, road, buildings, electricity – generation and supply, etc.)	a. To explore potential synergy in political influence for quality construction projects	a. Minimized political interference	Source of funds expected from Development partners
		b. To assess the prevalence of political influence in construction projects in Kenya.	b. Well managed projects	
		c. To establish the effectiveness of contract supervision and involvement by politicians in Kenya.	c. Adherence to set project timelines and cost limits.	

CHAPTER THREE: RESOURCE MOBILIZATION FOR NaCRA

INTRODUCTION

Resource mobilization for the implementation of the NaCRA Agenda is critical for the realization of the goal and objectives of this Agenda. Stakeholders are therefore implored to support the financing of research geared towards addressing priorities outlined in this Agenda.

Resource Mobilization methods

- Government of Kenya/NCA budgetary allocation.
- Professional & Contractors Boards, associations/institutions can be encouraged to set aside some money to support research in the industry.
- Local and international organizations & universities that support research & capacity building.
- Editorial committee can advise on resource requirement for the research activities.

CHAPTER FOUR: MONITORING AND EVALUATION

INTRODUCTION

Monitoring and evaluation techniques shall be used to track and review the implementation of the research Agenda.

4.1 Tools for Tracking Adherence to the Agenda

4.1.1 Monitoring and Evaluation (M&E) Reports

The Authority shall work with relevant stakeholders to undertake periodical M&E visits to areas where the approved studies are being conducted.

4.1.2 Progress and Final Reports

Progress and final reports shall be submitted to the research committee.

4.1.3 Database and Directory of Research Studies

Final reports of studies shall be compiled in a database and directories of approved research

4.2 Review of the Agenda

This Agenda has a lifespan of Five years. Informed by emerging issues in construction industry, there shall be annual evaluations followed by a final review of the Agenda after five years. Quarterly reports to be done progressively and the editorial committee members to monitor the implementation of the Agenda.

NATIONAL CONSTRUCTION RESEARCH AGENDA REPORT

ISBN 978-9914-9856-1-0



