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Resource Planning and Leveling (RP&L): A Look at Its Use by Construction Firms in Kenya

K.Nanchari,Waseem Ahmed,G Anjaneyulu

Abstract:
Effective resource management is crucial to the success of building projects. Both resource planning and leveling are essential parts of resource management that should be completely included and practiced on every site. Project expenditures, timeline overruns, and quality decline due to insufficient resource management via lack of planning and leveling. This claim is supported by the work of Tarek (2010), who argues that adequate resource planning and leveling aids in resolving resource conflicts, which present a number of difficulties for the organization, including the following: delays in completing certain tasks, difficulties in assigning a different resource to a certain task, inability to alter task dependencies, addition or removal of certain tasks, and overall time and cost overruns of projects. He goes on to state that the goal of resource leveling is to maximize project efficiency by making the most of available resources. Although many writers have written on the need of effective resource management, the author of this piece believes that resource planning and leveling within the Kenyan construction sector is under-explored. This is because of many factors that call for more investigation. Many authors, including Abeyasinghe et al. (2001), Ballard (2000), and Bandelloni et al. (1994), have delved into many facets of resource leveling and planning. However, it should be noted that all of these scholars discuss the issue in industrialized nations. The industrial sector is the inspiration for some of the available literature on the subject. This necessitates research into the Kenyan construction sector to determine the causes of widespread use of resource allocation and equivalization strategies. This study set out to investigate what role resource planning and leveling (RP&L) plays in the Kenyan construction sector and what variables influence contractor participation. Case studies with accompanying questionnaires were the primary method of data collection for this study. Nairobi served as the study location, and NCA Levels 1-3 Contractors were the subjects of interest. The 106 participants were selected via a random-sampling process. The final tally for the percentage of people who responded was 76%. Descriptive statistics, a relative significance index, and a spearman's correlation were used to assess the data. Despite widespread use of RP&L in Kenya's largely unstructured construction industry, the study found that: construction projects' progress is still impacted by delayed materials, a lack of labor, and a lack of equipment at the points of need; RP&L is more common in older contracting firms and where there is support from top management.Manuscript, Revised Version Dated February 16, 2017 as received.
Student at Jomo Kenyatta University of Agriculture and Technology (JKUAT), Juja, Kenya; full name, ShadrackMutungi Simon; major: construction project management.Dr. Abednego Gwaya, School of Architecture and Building Sciences (SABS), Jomo Kenyatta University of Agriculture and Technology (JKUAT), Juja, Kenya.
Department of Construction Management, School of Architecture and Building Sciences, Jomo Kenyatta University of Agriculture and Technology, Juja, Kenya, Dr. Stephen Diang'a.management; and finally a high degree of RP is associated with reduced negative impact of construction project progress

Keywords: Resource Planning, Resource Leveling, ConstructionProjectPerformance.

INTRODUCTION

The term "construction industry" refers to the broad sector of the economy that employs people at every stage of the process from planning and design through constructing, maintaining, and tearing down structures in the built environment (Chitkara, 1998). The building sector is crucial in emerging economies like Kenya, says K'Akumu (2007). This is as a result of the positive effects it has on the national economy as a whole,including the Gross Domestic Product (GDP), gross fixed capital creation, inter-sector links, and job opportunities it provides for the general people (United Nations Centre for Human Settlements, 1984).

However, successful expansion of the construction business depends on the timely and well completed building projects.

Department of civil
sairam3640@gmail.com,mdwaseem500@gmail.com,g.anjaneyulu143@gmail.com
ISL Engineering College.
International Airport Road, Bandlaguda, Chandrayangutta Hyderabad - 500005 Telangana, India.

Good preparation usually leads to greater effectiveness. Reddy and Nagaraju (2015) state that materials are crucial to the success of any building project. Unskilled workers, skilled workers, management, administrative support, technical support, tools, equipment, construction materials, and financial support are all examples of resources that may be needed throughout a project's duration. It is largely dependent on how well these resources are handled that the building sector performs (Abeyasinghe, Greenwood, & Johansen, 2001).

Planning for a building project is done with the assumption that the contractor will have constant access to all necessary materials and labor (Aslani, et al 2009). Resource planning refers to the practice of allocating resources to meet the needs of different project activities. This is carried out in a manner that causes little disruption to the projected end date of the project (Dubey, 2015).

In situations when there are adequate or even plentiful supplies of a given resource, yet it would be beneficial to smooth out the pattern of that resource's use, the resource leveling issue occurs. These variations are very undesired since they often cause contractors financial, utilization, and labor challenges (Schultz, Slevin, & Pinto, 1987). The goal of scheduling is to achieve relatively consistent resource demand, or to achieve acceptable non-uniform resource levels in resource leveling. The goal of the scheduling technique known as "Resource Leveling" is to minimize the impact of cyclical increases and decreases in resource demand. Using this method,

the resources so that we may distribute them as evenly as possible. Cost and schedule overruns are the direct outcome of inefficient resource management. Mendoza (1995) concurs, noting that most projects experience unnecessary delays due to insufficient resource planning and management. Low quality work is often associated with mismanaged resources. Planning and allocating resources fairly are the two most crucial parts of any resource management strategy.

LITERATUREREVIEW

Projectplanning

Projectplanninghasbeenarguedbymanytobethecornerstoneofanyprojectimplementation.Projectmanagementrequiresaproperstrategywhichisusuallyformulated at the planning stage. It gives a road map of howtheprojectwillbeimplementedandtheresourceswhichshallbeemployedintheprocessofexecutingtheproject.Planninginvolvesdefiningprojectgoals,specifyingtasksandformulating how the objectives shall be met (Badawiyeh,2010).

ProjectConstraintsinProjectPlanning

(a) LabourConstraints

Human resources are typically classified by the skills theybring to the project: carpenter, steel fixer, welder, painter,operator,inspectorandengineeramongothers(Cunningham,2013). Sometimes, the available labour lacks the skill andexpertise to effectively execute their mandates in the

project.Itisforthisreasonthatoncetheprojectteamorcontractorgeteffectiveworkforce,theyfinditverydifficulttoreleaseth em.They feel that they may get jobs elsewhere and lose them.They will then tend to hold on to them even when there is noworkfor thematthe moment.

(b) MaterialsConstraints

Most of the material resources required for constructionactivities are in non-renewable and not easily replenished.Some are not available locally and have to be imported fromoverseas. Periodic shortages are also bound to occur. Poorperformanceofprojectshasbeenblamedonmaterialunavailability and shortages within the construction industry(Lau&Kong,2006).

(c) EquipmentConstraints

Equipment is usually presented by type, size, and quantityand is often overlooked as a constraint. The most commonmistakeistheassumptionthattheresourcepoolissatisfactoryfor the entire project. High crashing or delay costs can beavoided by recognizing all equipment constraints before thestartoftheproject (Lau&Kong,2006).

ResourcePlanning&LevelinginConstructionProjects

Thefourmainessentialresourcesrequiredinanyconstruction project include; materials, equipment, peopleand time. For the project to accomplish the project plan andschedule, it is important to make sure that the necessarymaterials,personnel,equipmentandtimeareavailedindesiredquantitiesatthetimetheyarescheduledforinthe

projectplanandschedule.

Despite resource planning phase being very important inconstruction projects, many projects suffer avoidable delaysfrom inadequate resource planning and control (Mendoza,1995).Resourceplanningaimstoidentifyresourcequantitiesfor different activities and schedule these resources over theprojectduration.

The aim of undertaking resource planning is to identify the:typesoflaborrequiredfortheproject;rolesandkeyresponsibilitiesforeachlabortype;numberofpeoplerequiredtoundertakeeachrole;quantitiesandtypesofequipment required; items of equipment needed and theirpurposesandtotalamountofmaterialsrequired(Kass,2012;Kumari&Vikranth,2012;Stukhart,1995;Badawiyeh, 2010).

Resource Planning and Leveling can either be carried out inthe head office or site office depending on where the personexecuting the exercise is based. It can either be carried out in aformally written or informal unwritten format. A range ofpersonnel working under the contractor can be utilized tocarryout the exercise.

LabourResourcePlanning&Leveling

The most important resource to a project is its people; theprojectteam.AccordingtoMendoza(1995),humanresourcesforconstructionprojectscanbegroupedintothreecategories;officepersonnel,construction

personnel(fieldsupervisionandlabor)andconstructionsub-contractors.

Thetaskofpersonnelrecruitmentforconstructionprojectslieswiththeprojectmanagerwhomaydelegatetheresponsibility to the construction manager or other projectteam members. It is thus the responsibility of the recruitingofficer to acquire the personnel according to the needs of theproject. It is also their responsibility to release the personnelfromtheprojectiftheyarenolongerneededbytheproject.

MaterialResourcePlanning&Leveling

The materials plan is used to guide the project manager inplanningformaterialresources.Dependingonsiteconstraints,differentapproachescouldbeusedtoplanforthematerials schedule. Concepts like Just-In-Time (JIT) havebeen used for confined sites. Though this concept is widelyconsidered as the best for procuring materials, it can only beused for materials whose future availability is certain. Whiledifferentsitesadoptdifferentstrategiesformaterialsplanningandscheduling, they shouldall ensure that materials arepresent on site at the time the project schedule dictates andthey should not be seen to delay the project (Ala-Risku&Kärkkäinen, 2006).

EquipmentResourcePlanning&Leveling

This involves identification of all the equipment that will berequired to accomplish the project, e.g.: office equipment(PCs,photocopiers,mobilephonesetc.),telecommunicationsequipment(cabling,switchesetc.)andmachinery(heavyandlightmachinery)(Charoenngam,2003).Sequencingofconstruction activities should be in such a way that equipmentfrom one activity can be shifted to the other on its completion.Thisaimstoreducethetotalrequirementofequipmentatanygiventime.Italsoseekstoachieveeffectiveutilizationof

equipmentontheproject.

I. RESEARCHMETHODOLOGY

BasedontheargumentraisedbyBryman,(2004),Bryman& Bell, (2007), Creswell, (2009),and Spector, (1981), thisstudy can be classified as a survey research design, becausequantitativedatawascollectedonseveralvariablesduringthesametime.Surveyresearchcomprisesacross-sectionaldesign in relation to which data are collected predominantlyby questionnaire or by structured interview and at a singlepointintimewiththeaimofcollectingabodyofquantitativeor quantifiable data in connection with the variables, whicharethenexaminedtodetectpatternsofrelationshiporassociation (Bryman, 2008).Broadhurst, Holt, & Doherty,(2012) indicate that methods used to collect data in a surveyresearchincludequestionnaire,interview(structuredorloosely structured), observation, analysis of documents andunobtrusive methods.The researcher used questionnaires toseek theopinions and actual information from the targetpopulation.

TheresearchsitefortheproposedstudywasNairobiCounty. This formed the basis for establishing the targetpopulation.Theresearchwasconfinedtobuildingcontractorsregisteredundercategories NCA1toNCA3inthisgeographicalscope.

The target population comprised of 145 contractors drawnfromNCA1toNCA3categories.Asuitablesamplesizewasdeterminedusingthefollowingformulaextractedfrom Ankrah (2007) and originally postulated by Czaja& Blair(1996).Thesameformulahasalsobeenadopted byMugenda&Mugenda,(1999).

N=(z^2xp(1-p))/c^2Where:N=samplesize;z=standardizedvariable(1.96 whichcorrespondsto95%confidencelevel);p=percentagepickingachoice,expressedas a decimal (50% or 0.5 was used.); 1- p = proportion of thetargetpopulationnothavingtheparticularcharacteristics;c= confidenceinterval,expressedasadecimal(degreeofaccuracyrequired,usuallyset at0.05).

Random sampling was used to select the 145 respondentsinthisstudy.DataobtainedwasanalyzedusingtheStatisticalPackagefor SocialScientists(SPSS v.21).

DATAANALYSISANDDISCUSSIONS

Respondents'ResponseRates

Outofatotalof106questionnairesdistributedtorespondents,81 werereturned.Thiswasequivalenttoaresponserate of76%.

DemographicProfilesofRespondentsandtheirFirms

RoleoftheRespondentintheFirm

Table4.1belowindicatesthatthehighestpercentage(24.7%) of respondents were Site Agents while the lowestwere Architects with a representation of 1.2%. These resultsdepict the norm in the Kenyan construction industry; that thecontractorismainlyintheoffice(henceafrequency of23.5%) and mostly represented by a Site Agent (hence afrequencyof24.7%)inmostconstructionsites.Whilealmostallconstructionsiteshaveforemeninchargeofdifferent tradesorevenageneralforemaninchargeofallotherforemen, a low frequency was due to the desire to mostlyengage academically competent persons to respond to thequestionnaire.TheroleofanArchitecthadthelowestfrequencypossiblyduetothefactthatmajorityofcontractorsinKenyarelyengageindesignworksincethemostprevalentprocurement systeminthecountryisthetraditionaldesign-bid-buildwherethecontractorisengagedwhenallthedesignworkhasbeenaccomplished.

firmsregardingresourceplanningandleveling.

ThepracticeofRP&LamongcontractorsA number of questions were included in the questionnaireto explore the practice of resource planning and levelingamong contractors. These included: the extent to which theycarryoutresourceplanningandleveling;thekindofresourceplanningandlevelingcarriedoutbythecontractors;extentofsupport by top management in executing resource planningand leveling; the person bestowed with the responsibility ofcarrying out resource planning, educational background ofsuchpersonandtheiracademicqualification;aimsofundertakingresourceplanningandleveling;effectofdelayedmaterials, lackoflabourandequipmentonprojectprogress.

ExtentofEquipmentPlanning

When respondents were asked to rate the extent to whichtheycarryoutEquipmentResourcePlanning,theirresponsesproduced a mean of 3.67 as indicated in table 4.4. It is

clearfrom this that majority of contractors in the country practiceResource Planning in the Equipment category. The cost ofequipment in most building projects ranges between 20-30%ofthetotalprojectcost.Kumari&Vikranth,(2012)pointoutthat the equipment cost has to be controlled properly byallocating various items of equipment efficiently in differentphases of the project. Kass (2012) asserts that equipmentplanning is necessitated by the need to establish the size andvarious types of equipment needed either on rent or outrightpurchase.

ExtentofLabourPlanning

Contractors were asked to give the extent to which theycarriedoutLabourResourcePlanning,theresultsproduced ameanof3.94asindicatedintable4.4.Itisclearfromthisthatmajority of contractors in the country also practice LabourResource Planning. Labour planning helps the organizationmaintaintherightnumberofemployeesattheright timewiththe capability to execute tasks which are aimed at ensuringsuccessoftheproject (Thomas*et al*,2004).

ExtentofMaterialPlanning

Respondents were asked to rate the extent to which theycarryoutMaterialResourcePlanning.Theseresponsespro duced a mean of 4.23 as indicated in table 4.4. It is clearfrom this that majority of contractors in the country practiceMaterial Resource Planning. The cost of materials in mostbuilding projects ranges between 60-70% of the total projectcost. A study by Stukhart (1995) argues that the cost ofinstalled materials is more than 50% of the total project cost.According to Kumari&Vikranth, (2012), material planningisnecessarytofulfiltherequirementsoftheprojectatdifferent phases of the project while reducing wastage at thesametime.

Comparison between Equipment, Labour andMaterialPlanning

AsseeninTable4.4,themeansfortheextentsofresourceplanning bycontractorsinthecategoriesofEquipment/Plant,Labour and Materials were 3.67, 3.94 and 4.23 respectively.Thismeansthathighestlevelofresourceplanning bycontractorsisinthecategoryofmaterialresources.However, means of 3.67, 3.94 and 4.23 indicate that contractors in theKenyan construction industry carry out extensive resourceplanninginallmajor categoriesofresources.

Source:(Author,2016)

Theresults,aspertable4.8indicatedthatthemostsignificant factorconsidered when carrying out ResourcePlanning and Leveling was “Identify the total amount ofmaterials needed” with a RII of 0.8988. Other factors indescending order were: “Identify the types and quantities ofequipment needed” (RII=0.8765); “Identify the number ofpeople required to fill each role” (RII=0.8765); “Identify therolesandkeyresponsibilitiesforeachlabortype”(RII=0.8625) and lastly “Identify the Items of equipment to beused andtheir purposes” (RII=0.8716)

Since the questionnaire gave the option of respondentssuggestingotheraimswhichtheyconsideredtoberelevant,anumberoffactorswereobtainedfromthestudy.These were:identify time needed to complete a specific task; determinerate of labour and equipment in terms of time; to identifywhichtradeoflabourerswouldbetobelaidoffastheamountof work decreased; identify and prioritize procurement ofresources time wise; to assist in planning accordingly; toensuretheprojecthastherightskillsandmaterialsattherightti me; identifying the cost of the project; identifying the timeneeded and timelyplanning.

Effects of resource unavailability on projectprogress

Respondentswereaskedtoindicate(onalikertscale)howoften the progress in their projects was affected by delayedsupplyofmaterials,lackoflabouronsitesandlackofequipmentonsites.

Althoughthisresearchhasalreadyestablishedthatcontractors pay more attention to material resource planningcomparedtolabourresourceplanningandequipmentresource planning, the table 4.9 below indicates that projectscarried out by respondents’ firms were more likely (3.11) tobe affected by delayed material compared to lack of labour(2.68) and lack of equipment (2.68). This means that moreneeds to be done with regard to material resource planning ifbuildingprojectsaretoproceedmoresmoothly.Howeveritcould also be argued that material resources are an extensivearea which involves many external project participants in thename of suppliers. This means that even though proper plansmaybeputinplacetoensurematerialsareonsiteeverytime they’reneeded,itishardtocontrolparties(suppliers)whoarenot on site and whose activities are also affected by otherparties(manufacturers).

CONCLUSIONS&RECOMMENDATIONS

Conclusions

Thefollowingconclusionsweremadefromthisstudy:

ThereisahighlevelofusageofResourcePlanningandLevelingintheKenyanconstructionindustry.Howevermuchofthisiscarriedoutinanon-structuredmanner.

Sincetheemergenceofprojectmanagementprofession,project managerscontinuetoberelieduponbycontractorstohandleresourcemanagementinconstructionprojects.

ThereasonsestablishedforcarryingoutResourcePlanningand Levelingfromcontractorswereallanchoredtothethreemaincategoriesofresourcesnamely;material,labour andequipment.

Despite contractors carrying out Resource Planning,construction projects’ progress continue to be affectedbydelayedmaterials,lackoflabourandlackofequipmentatthe pointsofneed.

Older contractors perform better in Resource PlanningandLevelingcompared toyounger firms.

Resource Planning and Leveling is practised more incontractingfirmswherethereissupportfromtopmanagement.

Recommendations

Thefollowingrecommendationsweremade

Personnel engaged in Resource Planning and Levelingin contracting firms should not just be academicallyqualifiedbutshouldalsopossessadequateexperienceintheareaofresourcemanagement.

All levels of employees should be integrated in theresourceplanningandlevelingexercise.Labourersemployed in construction sites should also be properlytrainedonthebenefitsofresourceplanningandleveling.Thiswillhelpimprovetheirmorale.

Contractorsshouldpreferablyemployprofessionalswho have a background in the construction industry intheir sites.

REFERENCES

Abeyasinghe, Greenwood, & Johansen. (2001). An efficient

methodforschedulingconstructionprojectswithresourcecons
traints.InternationalJournalof
ProjectManagement,19(15),29–45.
Ala-Risku, T., &Kärkkäinen, M. (2006). Material delivery problemsin construction projects: A possible solution. International Journal ofProduction Economics,
104(1), 19–
29.http://doi.org/10.1016/j.ijpe.2004.12.027
Ankrah, A. (2007). An investigation into the impact of culture onconstruction project performance.UniversityofWolverhampton.
Aslani,P.,Christodoulou,S.,Griffis,F.H.,Ellinas,G.,&Chiare
lli,L.(2009).Activityprioritisationunderresourceconstraintsu
singautilityindexmethod.TheOpenConstruction&BuildingT
echnologyJournal,3,33–41.
Badawiyeh,B.H.(2010).TheEffectofPlanningandResourceL
eveling.
Ballard.(2000).Thelastplannersystemofproductioncontrol.U
niversityof Birmingham,UK.
Bandelloni, M., Tucci, M., & Rinaldi, R. (1994).Optimal resourceleveling using non-serial dynamic programming. European Journal ofOperationalResearch,EuropeanJournalofOperationalRese
arch,78(2),162–177.
Broadhurst,K.,Holt,K.,&Doherty,P.(2012).Accomplishingp
arentalengagementinchildprotectionpractice?:Aqualitativea
nalysis of parent-professional interaction in pre-proceedings
workunderthePublicLawOutline.QualitativeSocialWork,11
(5),517–534.http://doi.org/10.1177/1473325011401471
Bryman,A.(2004).SocialResearchMethods(Fourth).London
:Oxforduniversitypress.
Bryman, A. (2008). Social Research Methods (3rd ed.). New York:Oxforduniversitypress.
Bryman, A., & Bell, E. (2007).Business Research Methods. London:Oxforduniversitypress.
655–663. Retrieved
fromhttp://www.irbnet.de/daten/iconda/CIB4451.
pdf
Mendoza, C. (1995). Resource Planning and Resource Allocation intheConstructionIndustry.Universityof Florida.
Mugenda,O..,&Mugenda,A..(1999).Researchmethods:Qua
ntitativeandQualitativeApproaches. Nairobi:Acts Press.
Naief,H.(2002).Acomparativeevaluationofconstructionand manufacturing materials management. International Journal of ProjectManagement,20(4),263–270.
Reddy,B.S.K.,&Nagaraju,S.K.(2015).AStudyonOptimizati
onofResourcesforMultipleprojectsbyusingPrimavera.Journ
alofEngineeringScienceandTechnology,10(2),235–248.
Schultz,R.L.,Slevin,D.,&Pinto,S.K.(1987).Strategyandtacti
csinaprocessmodelofprojectmanagementinterfaces.Manage
mentJournal,17(3),34–46.
Siboe,W.(2016).InvestigatingtheAdequacyofConstructionP
lanninginKenya.JomoKenyattaUniversity ofAgriculture andTechnology(JKUAT).
Spector,P.E.(1981).Researchdesigns,84.http://doi.org/10.41
35/9781412985673
Stukhart, G. (1995). Construction materials management. New York:MarcelDekker Inc.
Tarek,H.,& Wail,M.(2010).Critical pathsegmentsschedulingtechnique.JournalofConstructionE
ngineeringandManagement,AmericanSocietyfor
CivilEngineers(ASCE),138(6),786–787.
Thomas, S., Skitmore, R., Lam, & Poon, A. (2004). Demotivatingfactorsinfluencingtheproductivityofcivilengin
eeringprojects.InternationalJournalof
ProjectManagement,136–146.
Charoenngam, C. (2003). Planning and scheduling consideration
andconstraintsinautomatedconstructionenvironment.13thIS
ARC,475–482.
Chitkara.(1998).Essentialsofconstructionprojctmanagemet.
Newsouthpublishing.
Clough, R., & Sears, G. (1991).Construction Project Management.NewYork:JohnWiley&Sons,Inc.
Creswell, J. (2009). Research Design; Qualitative, Quantitative andMixed Methods Approaches.Journal of Chemical Information andModeling(Second,Vol.53).London:SagePublications.htt
p://doi.org/10.1017/CBO9781107415324.004
Cunningham,T.(2013).FactorsAffectingTheCostofBuilding Work
-AnOverview.DublinInstituteofTechnology,0–21.
Czaja,R.,&Blair,J.(1996).Designingsurveys:aguidetodecisi
onsandprocedures.London:PineForgePress.
Dubey,A.(2015).ResourceLevellingforaConstructionProjec
t,12(4),5–11.http://doi.org/10.9790/1684-12440511
Hegazy,T.(2010).ResourceLevelingVsResourceAllocation, 59–65.Retrieved from
http://www.tutorialspoint.com/management_concepts/reso
urce_leveling.htm
K'Akumu,O.a. (2007). Construction statistics review for Kenya.ConstructionManagementandEconomics,25(3),315–
326.http://doi.org/10.1080/01446190601139883
Kass, M. M. A. E.-A. (2012). A construction resources managementsystemfor gazastripbuildingcontractors,131.
Kumari, K. S., &Vikranth, J. (2012).A Study On Resource PlanningInHighwayConstructionProjects,2(August),1960–
1967.
Lau,E.,&Kong,J.J.(2006).IdentificationofConstraintsinCon
struction.ProjectsToImprovePerformance.SustainableDevel
opmentthroughCultureandInnovation,
655–663. Retrieved
fromhttp://www.irbnet.de/daten/iconda/CIB4451.
pdf
UnitedNationsCentreforHumanSettlements.(1984).TheCon
structionIndustryinDevelopingCountries.UNCHSHabitat,2.