Moderating Influence of Environmental Factors on the Relationship between Participatory project Management Life Cycle and Performance of Mango Farming Projects in Makueni County, Kenya

Charles Kyale Kisumbi[1], Dr. Angeline Sabina Mulwa[2], (Ph.D.), Dr. John Mwaura Mbugua[2], (Ph.D.)
[1]Ph.D. Candidate and Corresponding author, Department of Management Science and Project Planning, University of Nairobi, Kenya
[2]Senior Lecturer, Department of Educational Management, Policy and Curriculum studies, University of Nairobi, Kenya
DOI: https://doi.org/10.47772/IJRISS.2023.70580

Received: 26 April 2023; Accepted: 16 May 2023; Published: 12 June 2023

ABSTRACT

The objective of this research, based on a PhD thesis, is to highlight the need for crafting a resilient and robust environmental policy for managing the effects of anthropogenic social hazards in numerous mango projects. The rate at which human-caused anthropogenic pressures have deteriorated pristine ecosystems has converted them into multi-faceted areas of environmental concern. Unplanned activities caused by human economic factors have drastically intensified the growth of uncontrolled polluting projects across the globe and in Africa. They influenced climate change, global warming, and desertification in sub-Saharan Africa. This study advocates for a pragmatic and resilient environmental policy that acts as a catalyst for reducing environmental degradation, which stifles long-term economic growth in mango-growing regions. The performance of the Mango projects did not achieve economic efficiency and optimality yields in this research due to variable rainfall, climate change, and global warming, among other natural and human economic consequences. Reduced forest cover resulted in environmental disruption that impacted the well-being of water catchment towers and their self-sustaining and self-replenishing riparian ecosystems. It also endangered the biosphere, the life-support compartment, the only part of unique biotic and abiotic compartments that supply nutrients and support flora and fauna in a wide range of riparian ecosystems. The study examined how environmental factors influenced the relationship between the participatory life cycle and project performance. The study also sought to investigate how "strategic-fit" those project environments in mango zones were due to the emerging existential risks occasioned by the sporadic proliferation of polluting projects on the global and local scene. Data were collected using structured questionnaires, interviews, and observation guides. The pragmatism research paradigm was selected since it collects both quantitative and qualitative data.From the statistical analyses of correlation and regression, results indicated that, with DF (2, 367) =9.23, t=6.511 at the 95 % significance level P=0.000<0.05, r=0.324 and R2= 0.124, depicted, the test was statistically significant and the null hypothesis rejected. The paper recommends designing a resilient environmental policy to manage the adoption of SMART regenerative agriculture on mango farms, with the backup of participatory regulations that guide carbon sequestration measures to control emerging anthropogenic disasters.In this study, mango fruit was adversely affected by extreme weather conditions and erratic environmental changes. Majorly, the environmental changes were triggered and exacerbated by uncontrolled human activities that disrupted the self-replenishing steady state of nature, leading to global warming and climate change in many mango project environments. For this reason, people should have the smallest ecological footprint to enhance environmental justice and foster sustainable development in volatile mango project environments.

Key Words: Environmental factors, project performance, project environment, climate change and global warming, emerging anthropogenic forces, smallest ecological/environmental footprint, carbon sequestration, carbon pricing and carbon sinks.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue V May 2023

INTRODUCTION

The mango fruit formed the study's foundation. The performance of the mango crop was affected by unplanned human activities that carried over from the pre-harvest to the later post-harvest phases of the projects, as well as by unforeseen changes in the projects' natural environment. The mango projects were to contribute economically to alleviate the looming, pervasive poverty in the rural community. The extent to which environmental factors primarily stifled mango production eventually affected mango farmers' income in the whole agriculturally-based economy. Mangoes in Makueni County performed moderately but had a lot of growth potential. If this is scaled up, the incomes of mango farmers and the county's and nation's economies could be of great economic benefit. Reports on mangoes in a study reveal they have faced numerous issues. (Muthini, 2015).

The incompatibility between political economics and ecological economics, which touched on spatial environmental policies that affected the long-term sustainability of the natural environment, was the study's focus on environmental issues. But then again, these two economic approaches were not always compatible or in tandem with enhanced mango performance as one outdid the other by creating competition, an existential state of nature, of uncontrolled human wants, when eking out a living from the already burdened and volatile environment.It might only be a matter of time before environmental economies fail to break the vicious cycles of existential poverty if such disparities fail to reduce needless competitive tendencies. In reality, the degradation of the environment increases reliance on the government's social welfare allocations because most people cannot fend for themselves. If environmental issues remain constant, poverty's shackles and the pervasive poverty pathologies that afflict developing countries will reappear, as they did during Latin America's Crisis and Perplexity during the 1980s economic meltdown and depression (Manfred-Maxneef, 1991; Cherry, 1995). That is why forest cover in Kenya is below 10% of the United Nations' prescription for the number of forests a country should have to check the bare minimum of excessive deforestation. A tangible solution via a bottom-up baseline in balancing the natural environment through the people, earth, and profit triple-p analogy, as stipulated in the book 'Carnivals with Forks,' to call on the global community to maintain the pristine environment across the globe needs adoption (Elkington, 1999).

Generally, many environmental spheres of influence impact the performance of mango projects. These environmental spheres are, such as the atmosphere (air, vapour, and steam), lithosphere (supportive earth's surfaces, ground minerals), biosphere (life biodiversity, for flora and fauna), hydrosphere (water), and stratosphere (protective layers of gases surrounding the earth's atmosphere, for instance, the ozone layer) (Chu and Karr, 2013). Due to a lack of well-formulated, resilient pro-environmental policies and regulations backed by legal frameworks to govern the natural environment, excessive economic 'disturbance' of land use would lead to the dismal performance of mango and other food crops. It would also negate the very functionality of agricultural policies, which are often uncertain and unclear when trying to craft national development policies that spur socio-economic growth and development through situational awareness.For instance, the formulation of the UN SDGs called for "hard-nosed" strategic plans to tactically maneuver an effective redistribution of national and county resources to improve community social welfare to reduce poverty levels. It enhances individual and government projects' efficiency on development agendas executed as projects globally.Today's economic liberation in rural agriculture entails adoption of UN's 2030 SDGs (UN, 2015), as they offer a wholesome Pareto optimality redistribution of social welfare to alleviate the economic pitfalls and perils of the world's poor communities.In environmental terms, what happens in the East occurs spontaneously in the West, and vice versa, due to the linking of many earth's ecological ecosystems. That is why some pollutant projects on the international scene considered "safe" due to their immense contribution to economic growth and development ended up disrupting environmental sanity on a grandiose scale globally. External debt burdens in developing countries have made it more difficult for governments to direct tangible human and monetary resources toward combating environmental degradation

and decay, which has become a global threat that can only be reversed through a People, Earth, and Profit (Triple Baseline Footprint) approach (Elkington, 1999; Cherry, 1995).

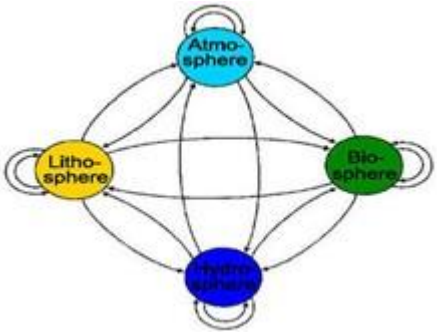
The strategic mission and vision in crafting the UN's resilient SDGs envisaged a utopian people-centred project environment, a utopian state of nature where people would improve their economic status by living in harmony with nature to eke out sustainable livelihoods. It would improve their lives without excessive disruption of the already burdened project environment. Given the numerous economic issues that plague today's project environment, political governance can enhance adherence to environmental laws through checks and balances. Water catchment towers are deteriorating, forest cover is lost, and riparian ecosystems are deteriorating, all while the ozone layer is depleting at an alarming rate globally. There is unabated degradation of water catchment towers, destruction of forest cover, and deterioration of riparian ecosystems, in addition to persistent ozone layer depletion, which is occurring at an alarming rate globally. The uncontrolled release of toxic gaseous emissions into the atmosphere, releasing harmful liquids to various flora and fauna, jeopardises the life-sustaining fundamentals of biotic and abiotic ecological ecosystems. A plethora of remedial application methods can minimise excessive carbon emissions to the environment where such polluting projects contribute to developmental redistribution and the allocation of community social welfare and resources. With climate-SMART sustainable strategies, carbon credits, carbon pricing monetary systems, and stringent carbon sequestration trapping technologies are employed to minimise excess carbon and enhance livelihoods (World Bank, 2014).

Mango production has the potential to alleviate food insecurity due to its local and global economic value. Mango cultivation should be integrated into agricultural and extension curricula in universities to address food security issues because of its value. In higher education institutions, the number of students studying agriculture as a discipline has decreased (Minde, Terblanche, Bashaasha, Madakadze, Snyder, and Mugisha, 2015). Educating and transferring mango production and management skills to farmers for use on farms is vital. Generally, mango farmers should also be taught in workshops a wide array of resilient agricultural principles and practises that enhance modern farming methods. The workshops should include, but not be limited to, robust regenerative, modern farm animal and crop husbandry methods, dryland agricultural practises, and the use of farm tools and implements to enhance mechanisation and innovative technology for better farm ploughing activities. Even though many Kenyans are hard-working farmers, food security remains an ongoing issue throughout the country. Agriculture is still the backbone of the economy, employing a large percentage of the population (USAID, 2021). The best management practices should facilitate and mitigate the white-collar syndrome that has bedevilled food insecurity for a long time due to a lack of markets and credit (Adesina and Eforuoku, 2016). Young people should be encouraged to take up agriculture as a career to be bequeathed farm work by the ageing generation since their dwindling energies to feed the ever-increasing population have become untenable (Minde et al, 2015).

Project waste management should embrace viable containment measures for reducing the number of greenhouse gases, such as chlorofluorocarbon emissions, released into the atmosphere. The greenhouse gases deplete the radiation-protective ozone layer and predispose the earth to environmental disasters. A better-quality continuum measure of a well-sustained project environment is the only economic emblem of sustainable economic development, essential for faster rural development. Nevertheless, due to a lack of clear and stringent measures to address and limit environmental difficulties, pollutant projects have been 'officially' permitted to habitually continue degrading project environments by emitting carbon dioxide and other chlorofluorocarbon agents into various environmental ecosystems, such as the lithosphere, atmosphere, biosphere, hydrosphere, and stratosphere (Husar, 2015). When it continues for a long time, it will expose the earth to imminent climate change, global warming, and desertification. Unless addressed and new technologies are adopted to combat climate change and global warming, it would be humanity's next time bomb of immense catastrophic magnitude to deal with at once in the future.

Global Interlinkageon Earth's Environmental Spheres ofBiotic and Abiotic Ecosystems

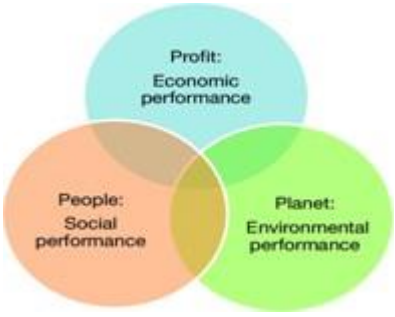
On the moderating influence of environmental factors contributed by humankind and nature, the basic concept of a sustainable project environment revolves around linking biotic and abiotic ecosystems as one leverage unit to balance control of anthropogenic forces across the globe. The figure above exemplifies the environmental spheres analogue, consisting of the biosphere, lithosphere, atmosphere, and hydrosphere, depicting how chemicals get distributed across the four major compartments of the environment of the earth's conceptual spheres (Husar, 2015):



Source: Metaphors for human-induced material flows (Husar, 2015).

The biosphere section is critical for organic matter, which occupies the surface that includes the other spheres and thus serves as the chemical heart pump through which matter flows in nature (Husar, 2015). The biosphere's responsibility is to recycle energy and matter on a large scale by mobilising biotic matter across all regions of the world (Husar, 2015). Furthermore, human activities resemble the function of the nature, for the redistribution of chemicals (Husar, 2015). The atmosphere is the transport-conveyor compartment that moves hydrologic substances through the hydrosphere and acts as a conveyor in watersheds (Husar, 2015). The lithosphere comprises soils and rocks that reach depths of about 50 km below the earth's surface (Husar, 2015).

It is paramount for project managers to be aware as they determine the future state of the project environment as a whole (Husar, 2015; Clark and Munn, 1986).Thus, project managers need to be more vigilant and attuned to the surroundings of a project environment to understand its cultural, organizational, and social settings to identify the project stakeholders that influence positive project outcomes (Wideman, 2001). The figure below shows a simple analogy of 'political economics' on environmental performance driven by the profit motive:



Source: Socially Responsible Business: A Model for a Sustainable Future (Franco and Masato, 2017).

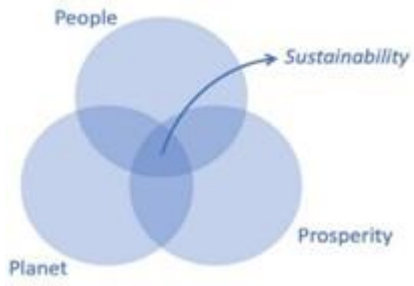
Key environmental models showing people's justice in accessing environmental benefits, planet earth's ability to withstand proliferation of pollutant projects in respect to economic prosperity, and the overall sustainability for the sake of future generations; must always be set up for policy guidance purposes. The

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue V May 2023

optimal project environment concept view of Sustainability concerns the question of Triple P (planet, people, profit); which is about discovering an unequivocal balance between the quality of environment, economic motive for human prosperity; including the key element which many business and development project organizations have tended to overlook for a long time, **''the social justice element''**; which in essence moves business and project organizations to an absolute state of sustainability, replete withal its humankind economic happiness trickledown for optimally sustained environment (Elkington, 1999).

This environmental view has been supported and documented fervently on the idea of sustainability in developing countries, showing that a sustainable society lives within the self-perpetuating boundaries of its environment. (Coomer, 1979); to enhance people's living standards. In this environmental endeavor, humankind should always make sure their environment is sustainable because it was revealed that immense deficits in project environmental setups are usually occasioned by ***''present generations consuming more than the replenish-able resources belonging to the future generations'',*** in years to come (Brown, 2002). A sustainable environment entails ***a 'careful assemblage of humankind, innovative and dynamic environmental systems which mimics nature's*** self-replenishing systems to check and control environmental deterioration and decay in rural areas (Jorna, 2004).

A sustainable environment is attainable through adherence to ecological inducements, fronted as the only humanity's systemic economic and environmental emancipator to curb the already flourishing ecological menace. It is vital to adopt an ecological subsystem able to leverage a balance between people, planet, and profit for redeemable and reversible '*induced economic disturbances'* as depicted in the figure below, which drives sustainability as environmental and social justice (Elkington,1999):



Source: 3 Ps (on Elkington's sustainable environment) Triple Bottom Line Really Mean (Kraaijenbrink Jeroen, 2020).

In order to achieve a sustainable project environment, project organizations, agencies and other meso-actors engaged in care of environment, should always be steadfast in searching for good project management practices that hasten the fundamental wheels of socio-economic development to realise faster rural development. A feasible pragmatic search to understand the volatile environment has been overwhelmed by many ambiguous environmental policies and regulations, some contradicting each other. Duplication of legal frameworks and unclear environmental planning methods conflict with each other on the optimal use of land spaces occupied by natural resources and people-centred development projects. There is an urgent need therefore, to put an end to environmental degradation as it affects sustainable development and people's health in the long run.

Statement of the Problem

Climate changes in the environment have had a negative influence on mango performance. In any project environment, there are experiences with various environmental concerns and internal and external factors that affect socio-economic development in growing areas.Some impediments limit mango farmers' progress, which revolves around their skills in a changing environment (Mulinge, 2015 The external factors inherent in mango farming zones include but are not limited to political goodwill and support, changes in socio-

economic trends, financing motivation, technology, public policies, global warming, and climate change exacerbated by acts of nature and other anthropogenic factors. Other issues raised in mango growing zones included marketing, go-between threats of collusion in offering lower prices, a lack of collective bargaining power, disorganized mango collection points, and postharvest losses (Purushottam, 2015; Muthini, 2015; Osena, 2011).

The project environment is affected by the existence of local and global pollutant projects which spewed liquid effluences without abandon of toxic gaseous emissions and dumped solid wastes, which damaged the environment and eventually altered the regular rainfall precipitation patterns. Many projects that use combustion fossil fuels to run industries end up spilling waste oils and emitting gases that affect the environment and human health. It led to environmental deterioration, posing an imminent ecological disaster for human life and mango production. Degradation endangers environmental sanity (Choudhary, Chauhan, and Kushwah, 2015).The pollutant projects around the globe contribute negatively to global warming and climate change affecting most of the developing countries in the tropics. Carbon sequestration measures that use natural carbon sinks (such as soils, forests, lakes, seas, and oceans), including carbon pricing deterrent measures, should be imposed on project organizations and industries that harm the environment. Diligent care is needed since carbon dioxide and other harmful greenhouse gases that harm the environment globally will continue to affect human life through climate change and global warming. Pollutant projects in any project environment degrade the environment by releasing chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), and other fluorinated greenhouse gases, all of which eventually deteriorate and degrade the naturally pristine environment (Greenpeace, 2009).

Mango farming projects in Makueni County, besides other agricultural projects in developing countries, have not been spared by environmental degradation and weather changes. Many greenhouse gases, if not all, are the primary contributory global threat to humankind's survival as they destroy and deplete the ozone layer, exposing the earth's global warming. The Triple P (planet, people, and profit) analogy suggests that humankind needs to find a sustainable balance between the planet's environmental quality, people's social justice, and desired economic profit-motive for a safer world (Elkington, 1999). There are cases of mango trees drying in Makueni County due to global changes in climate. The destruction of the ozone layer by ultraviolet rays has led to catastrophic droughts and crop failure, especially on lands within the tropics. Pollutant projects in diverse projects environments are known to create climate changes and global warming by stimulating tsunamis and other ocean-strong tornado winds, earth's seismic tremors in the Pacific Ring of Fire (PRF), and earthquake fault lines in the world's continents. Besides other greenhouse gaseous emissions, the HFCs are worse off than CO2 in being to the environment (Greenpeace, 2009).

The study on the environment shows that if it is not taken care of, it might interfere with the survival of humankind on the planet earth. Despite numerous environmental global conferences and forums, including the Brundtland Commission in 1987, the Rio Earth Summit in 1992, and the Kyoto Protocol in 2005, environmental degradation has continued unabated (FAO, 2017). The world has seen many conferences on climate change and global warming: Glasgow 2021, Paris Club 2018, Cancun Mexico 2010, and Durban South Africa 2011; all came and went, but still, the problems of the environment are yet to be solved. The Glasgow 2021 conference on resilience environment needs implementation to realize a meaningful positive change in the world. The Paris Club 2018, on the same environmental issues, adjourned abruptly in disarray without a clear state of global concern for the future, necessitating the Glasgow 2021 convention on climate change. Projects are the sources of economic growth and development, but their negative impacts affect the benefits of the mango projects. Otherwise, for a safer environment, man should have the smallest footprint on the earth in finding a balance between the triple P (planet, people, and profit) (Elkington, 1999). In maintaining a resilient, pristine environment, people should have the smallest environmental footprint possible to conserve the natural world for the present and successive generations by keeping the TBL (planet, people, and profit) on planet Earth (Elkington, 1994).

Experiences of rain-changing patterns, and over-flooding of the coastlines due to thawing frozen icebergs in the southern hemisphere ocean, are something this article is concerned about since it affects human life and mango farming in far-flung countries in the developing world. The people's daily insatiable endeavours to eke a living out of nature have trampled with their big footprint causing economic misery and underdevelopment, especially in developing countries in tropical lands. All ozone layer-depleting substances that degrade and deteriorate environmental sanity should be cut to a minimum or be eradicated for human survival (Greenpeace, 2009). The world seems to be living at crossroads and courting an environmental disaster, aware or unaware. Carbon sequestration methods to control environmental degradation in all pollutant projects need penalties as a deterrent measure. In combating climate change and global warming, environmental protection needs expert direction for the world to become one interconnected ecological unit (Elkington, 1999). Writing for the twenty-first-century generation, John Elkington predicted a worldwide catastrophic climate change and global warming in his book "Cannibals with Forks: The Triple Bottom Line of Twenty-First-Century Business" (Elkington, 1999).All ozone layer-depleting substances that degrade the environment, affecting the planet earth negatively, should be cut to a minimum or eradicated from the face of the world (Greenpeace, 2009).

Hypothesis

H_{01}:There is no significant relationship between moderating environmental factors and performance of mango farming projects in Makueni County, Kenya.

LITERATURE REVIEW

In most agricultural development projects, there were observed realities in weather changes which had serious environmental consequences (Normand, Lauri and Legave, 2015). Nature and people are inseparable in an environment where human beings eke out a living from the very environment for survival. Environmental factors as the moderating variable involves natural and human activities that affect performance of mango projects. Addressing environmental factors collectively is key to improved mango production as depicted in the study's conceptual framework. On the containment measures of climate change and global warming, human beings should have the smallest footprint on the planet earth so as to seesaw-balance the competing environmental constraints of triple 'P', planet, people and profit (Elkington, 1999). The intricacies of environmental factors are two-fold; natural involving acts of nature, and human-made, based on human inducements of microeconomic issues affecting the environment. As depicted in Kenya's Vision 2030, only three pillars from the PESTEL Analysis (political, economic, social, technological environmental, and legal) of Professor Francis J. Aguilar, 1964, on macro (external) factors adopted; political, social, and economic, as a strategic blueprint for making Kenya a middle economy earner with better living standards, come the year 2030 (Kenya Vision 2030, 2008). Scanning of business environmental factors is essential because every other business starts as a project in any project business case. Towards this end, environmental factors affect the agricultural environment.

The agricultural sector is prone to climatic changes, governance, and environmental policies, which eventually affect the performance of the projects. Human beings need to have a sustainable quality balance between environmental qualities (for Planet), social justice (for people), and safe economic returns (for Profit) to achieve an environmentally safer world for humankind to live in harmony (Elkington, 1999). The agricultural sector faces numerous environmental issues, some human-made and others by acts of nature that seem unending in many developing countries. The concern is how various environmental factors affect the performance of mango farming projects. Climate variability poses challenges to agriculture, requiring the adoption of efficient agricultural methods which promote socio-economic development and guarantee success (Makate, Makate, and Mango, 2018). There are emerging environmental issues experienced today:

erratic rainfall precipitation, degradation, and destruction of water catchment towers supposed to replenish nature's ability to sustain all life; humans, flora, and fauna. Climate change and global warming have compounded the environmental problem further by human encroachment in water catchment towers and riparian ecosystems have diminished rainfall precipitation and availability of water affecting the whole agricultural sector. Climate-Smart Agriculture (CSA) is about developing new technologies to intervene in agriculture (Makate *et al,* 2018).

Environmental factors contributedto socio-economic issues, controls extermination of crop-cross pollinators, environmental degradation and acts of nature (FAO, 2015). Mango fruits cultivated by Kenyan farmers are classified into three categories for the development of new prolific mango breeds adaptable to local environment (Gitahi, Kasili, Kyallo and Kehlenbeck, 2016). The moderating influence of environmental factors have contributed in success as well as failure of mango farming projects due to number constraints. The crop and animal husbandry endeavours by individual farmers, government agencies, NGOs, local and international research and agricultural organizations have been affected environmental factors. Environmental factors have become an area of great concern to United Nations, world governments, NGOs and individual farmers due experiences in diminished production in agriculture sector. Susceptibility to pests was reported on exotic cultivars, also being prone to diseases that lowers productivity leading to losses; unless mango farmers could afford safe chemicals for spraying the affected mango trees. Indigenous local landraces cultivars of mango varieties were tolerant, able to with stand droughts and in being more resistant and less susceptible to mango diseases and pests. Environmental sanity has been proven to involve the environmental balancing of triple P(planet, people, profit) in taking care to achieve environmental quality, its social justice to people and the economic profit element without affecting or degrading the planet earth (Elkington, 1999).

Nowadays, environmental degradation is being witnessed even under governments watch. Destruction of water catchment towers, forest cover, encroachments of riparian ecosystems and productivity depletion arable lands have led to reduced mango production. Climatic changes and global warming are some of dangers mango farm lands experienced. Fragmentation of arable lands into small uneconomical units of farm lands was shown to reduce mango performance. Changing land tenure systems and population increase were some of the challenges facing mango performance. The unpredictable production has seen an incremental surge in bilateral and multilateral partnerships in agricultural findings and sustainable ways of feeding the world's increasing population. The growth in technology, agricultural education and research stations, extension services, famines, and hunger need new containment measures. Incorporating stakeholders may enhance the performance of mango projects to spur economic growth and development. The impediments found in the socioeconomic factors call for proactive decision-making to control adverse environmental impacts that may affect the feasibility and viability of mango projects since they spur economic growth and development. The failure to comply with environmental laws and policies has thrown the national development agenda into disarray, leaving development programs unable to meet their pre-determined goals. To mitigate ecological degradation and destruction of forest cover, thus creating an array of sensitization measures and awareness through civic education, vital in reversing the negative trends. It has been alluded that despite environmental legislations and policies in statute books, monumental degradation of the environment has continued unabated (Agbazue and Ehiemobi, 2016).

Theoretical Framework

The study employed project management theory (Warburton and Cioffi, 2014) to decompose the project life cycle phases and their project stakeholders. The study also uses the ladder of citizen participation formulated by Sherry Arnstein in 1969 as a community planning process that organized and involved various stakeholders. The theories combined would address the impending environmental issues in a systematic and organized manner that would mitigate environmental concerns rife in mango growing zones.

Conceptual Framework

The diagrammatic interplay depicts the framework.

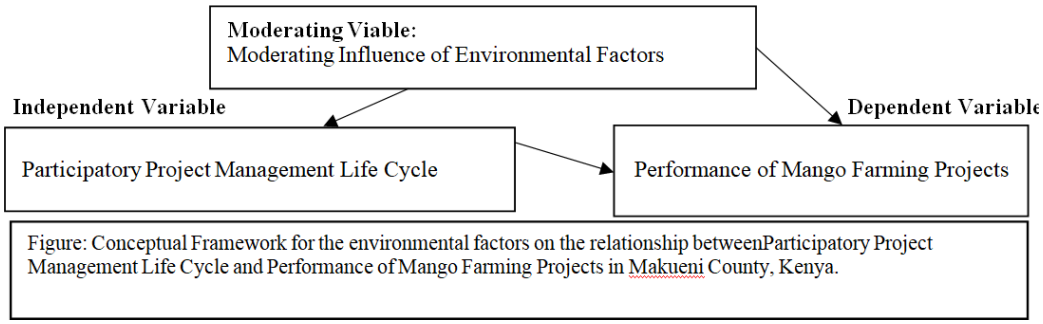


Figure: Conceptual Framework for the environmental factors on the relationship betweenParticipatory Project Management Life Cycle and Performance of Mango Farming Projects in Makueni County, Kenya.

RESEARCH METHODOLOGY

Makueni County, Kenya, was the area of the research. As it supports mixed-method data collection and analysis, the study used qualitative and quantitative research approaches guided by the Pragmatism research paradigm The study used the descriptive research design as the road map for collecting empirical data at a specific point in time. The study used the descriptive research design as the road map for collecting empirical data at a specific point in time.

Source: Map of Makueni County (Government of Makueni County, 2016; Musyoka, 2016)

There were 12,622 mango farmers in the study, with 375 chosen using the Krejcie and Morgan Table formula from 1970.In the final analysis, 369 questionnaires and analyzed, as indicated in the descriptive and inferential statistical tables.

RESULTS AND DISCUSSION OF FINDINGS

Moderating influence of environmental factors:

Table 3.1: Environmental Factors and Performance of Mango Projects

No.	Statement	SD	D	N	A	SA		
		F (%)	(F (%)	F (%)	F (%)	F (%)	Mean	SD
18a	Political leadership goodwill has not empowered mango farmers to achieve feasible and viable mango projects	60 (16.3)	70 (19.0)	23 (6.2)	104 (29.2)	121 (32.8)	3.6	3.25

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue V May 2023

18b	Political leadership in the area has led to increase of mango farming projects	152 (41.2)	130 (35.2)	28 (7.6)	32 (8.7)	27 (7.3)	2.1	1.90
18c	Political leadership has assisted mango farmers to find markets in local and international scene	102 (27.6)	97 (26.3)	69 (18.7)	50 (13.8)	51 (14.1)	2.6	2.46
18d	Mango prices has been stabilized making farmers reap more benefits in mango farming	121 (32.8)	108 (29.3)	42 (11.4)	43 (11.7)	55 (14.9)	2.5	2.37
18e	Socio- economic trends usually affect markets and consumption of mangoes leading to low market prices	40 (10.8)	61 (16.6)	63 (16.3)	101 (27.4)	104 (28.2)	3.5	3.2
18f	Financing in mango farming is not expensive and does not need collaborations of various mango actors	69 (18.7)	81 (22.0)	59 (16.0)	72 (20.0)	88 (23.8)	3.1	2.91
18g	Technology is used in telemarketing, management control of diseases and pests	87 (23.6)	84 (22.8)	61 (16.5)	82 (22.2)	55 (14.9)	2.8	2.67
18h	Managerial competences has not increased efficiency and effectiveness of production in mango farming	62 (16.8)	64 (16.6)	51 (13.8)	87 (23.6)	105 (24.5)	3.3	3.11
18i	Land tenure systems in land ownership does not affect mango farming projects	103 (27.9)	102 (27.6)	23 (6.2)	71 (19.2)	74 (20.1)	2.8	2.7
18j	Your mangoes are usually affected by variability of climate changes and rainfall patterns	32 (8.7)	36 (9.8)	28 (7.6)	108 (29.3)	165 (44.7)	3.9	3.6
18k	There is no lack of enough M & E experts in mango farming projects	102 (27.6)	108 (29.3)	71 (19.2)	42 (11.4)	46 (12.5)	2.5	2.37
18l	Environmental factors contribute to loss and waste of mangoes in pre-harvest and post-harvest phases of mango cycles	36 (9.8)	33 (8.9)	32 (8.9)	124 (33.6)	144 (39.0)	3.8	3.55
	Composite mean and standard deviation						3.04	2.84

n=369

Composite mean =3.04

Composite standard deviation=2.84

Cronbach's Alpha (a) Reliability coefficient =0.911

Table 3.1 establishes that the composite mean (M) was 3.04 and SD 2.84.It inferred that the respondents were more neutral and that environmental factors influenced the performance of mango projects. The Cronbach's alpha (a) reliability coefficient was 0.911, indicating items with strong internal consistency.

Item 18a investigated political leadership and how goodwill had not empowered mango farmers to achieve feasible and viable projects. According to the findings, the majority (32.8%) strongly agreed. The item had a mean of 3.6 and an SD of 3.25, which showed they were neutral about the statement. The mean was higher than the composite mean, implying that political leadership and goodwill influenced mango project performance. The results agreed with the key informants, indicating that political leadership and goodwill

influenced performance. The results were also in line with the interview report from the farmers, where one of them said,

"Political factors are key to improved mango production because most mango farmers are needy and need political support to do their mango farming".

Item 18b sought to investigate the claim that the area's political leadership increased mango farming. The findings show that 30.1% of respondents strongly agreed.The item had a mean of 2.1 and a standard deviation of 1.9, and respondents agreed with the statement. The mean was less than the composite mean, indicating political leadership in the mango performance.

Item 18c examined whether political leadership helped mango farmers find markets locally and internationally. Results showed that 27.6% of respondents strongly agreed with the assertion. The item's mean of 2.5 and standard deviation of 2.37 indicate that respondents were unbiased. The fact that the mean was less than the composite mean shows that political leaders influenced how successfully the mango projects performed.

The purpose of Question 18d was to learn what respondents thought about the claim that because mango prices have stabilized, farmers are benefiting more fromventures involving mango growing. Following the results, 32.8% strongly disagreed. The respondents did not agree with the statement, as indicated by the item's mean of 2.5 and SD of 2.37. The fact that the mean was less than the composite mean suggests the item influenced the mango projects.

The purpose of Item 18e was to find out what the respondents thought about the claim that socioeconomic factors had an impact on mango consumption and market prices. Findings showed that 28.2% of people strongly agreed with the assertion. The response was neutral, as evidenced by the item's mean and SD of 3.5 and 3.2, respectively. The fact that the mean was more than the composite mean suggests that socioeconomic factors had influence on mango performance. These findings were in line with a research by the FAO from 2015, which found that environmental factors had a moderating effect on socioeconomic problems, the eradication of crop-cross pollinators, environmental deterioration, and natural disasters.With regard to the claim that finance for mango growing was inexpensive and did not require the cooperation of diverse mango stakeholders, Item 18f attempted to obtain the respondents' opinions. According to the item's mean of 3.1 and SD of 2.91, 23.8% of respondents did not agree with the statement.The fact that the mean was more than the composite mean suggests that the performance of mango projects was influenced by financing for mango growing. The findings were consistent with the main informants' claims that mango growing requires the cooperation of many different mango stakeholders and is a very expensive endeavour. Throughout the interview, the farmers claimed receiving similar outcomes. As one of the farmers put it:

"Financing mango growing is highly expensive, and the government is doing little to help mango producers."

The findings aligned with the (FAO, 2015) study, which said that socioeconomic challenges required proactive decision-making to prevent adverse environmental consequences that impacted the feasibility and sustainability of agricultural initiatives to drive economic growth and development.

Question 18g sought respondents' opinions of the statement that technology was used in telemarketing, disease management, and pest control. According to the findings, 23.6% of respondents strongly disagreed. The question had a mean of 2.8 and a standard deviation of 2.67, indicating that respondents were unbiased in their response to the statement. The item had an effect on mango projects because the mean was lower than the composite mean.According to the findings, famines and starvation have not been eradicated in Africa or most of the developing world (Gitahi et al., 2016).

Question 18h aimed to elicit respondents' perspectives on the assertion that management competencies have not boosted the efficiency and effectiveness of mango agricultural output. According to the research

Item 18k seeks to obtain respondents' opinion on the statement that there was no shortage of M&E experts in mango growing projects. Following the results, 27.6% of respondents strongly disagreed. The item had a findings, 24.5% of respondents strongly agreed. They disagreed with the statement based on the item's mean of 3.3 and standard deviation of 3.11.The mean was higher than the composite mean, indicating that managerial abilities influenced mango project performance.

Question 18i sought to elicit respondents' thoughts on the statement that land tenure systems in land ownership had little effect on mango growing projects. According to the findings, 27.9% of respondents strongly disagreed. The question had a mean of 2.8 and a standard deviation of 2.7, indicating that respondents were unbiased in their assessment of the statement.

Item 18j was to investigate respondents' opinions on the claim that climate changes and rainfall patterns influenced mangoes. The statement was highly agreed with by the majority of responders (44.7%). The statement had a mean of 3.9 and a standard deviation (SD) of 3.6, indicating that the respondents agreed.The mean was higher than the composite mean, indicating that climate change variability affected mango project performance. The findings support the key informant report, which said that environmental elements are critical to increased mango output since, in most agricultural development projects, weather variations have major repercussions in mango production and culture. The findings were likewise consistent with the interview report:

"Many mango farming projects suffer an array of environmental difficulties, which include some that are man-made and others caused by climate change."

The findings concurred with (Elkington, 1999), who stated that humankind needs a sustainable quality balance between environmental factors (for the planet), social justice (for people), and sustainable economic returns (for profit) in the interest of creating an ecologically safer world for humans to live in. mean of 2.5 and a standard deviation of 2.37, suggesting they were impartial towards the statement. The mean was less than the composite mean, indicating that M&E specialists had no impacton mango projects performance. According to one farmer,

"The extension officers who undertake monitoring and evaluation appear to have other agricultural responsibilities and have insufficient time for M & E in mango farming projects."

Question 18l intended to get respondents' perceptions on the assumption that environmental factors led to mango waste and loss in the pre and post-harvest stages of the mango cycle. As indicated by the results, the majority (39%) agreed wholeheartedly with the claim. The mean of the question was 3.8, with a standard deviation of 3.6, indicating that the respondents agreed with the statement. The mean was higher than the composite mean, indicating that environmental factors influenced the performance of the mango projects. These findings concur with (Gitahi et al, 2016), who upheld that environmental problems have become a major concern for the United Nations, world governments, NGOs, and individual farmers as a result of decreased agricultural productivity.

Exotic cultivars have indeed been found to be pest and disease prone, resulting in large losses unless mango farmers can afford safe pesticides to apply on afflicted mango trees. The same findings were presented in the farmer interview, where one farmer stated,

"It is true that environmental factors such as minimal rain and a lengthy drought in Makueni County have resulted in mango spoilage and waste during the mango cycle's pre-harvest and post-harvest stages."

Correlation Analysis and Linear Regression Model

Testing of the Hypothesis

$H0_7$: There is no significant relationship between environmental factors and performance of mango farming projects in Makueni County Kenya.

Relationship between Environmental Factors and Mango Performance

Table 3.2:Correlation between Moderating Influence of Environmental Factors and Mango Projects Performance

		Moderating environmental factors	Performance of Mango Farming Projects
moderating environmental factors	Pearson Correlation	1	.668(**)
	Sig. (2-tailed)		.000
	N	369	369
Performance of Mango Farming Projects	Pearson Correlation	.668(**)	1
	Sig. (2-tailed)	.000	
	N	369	369

**** Correlation is significant at the 0.01 level (2-tailed)**

The results in Table 3.2 demonstrate that there was a significant positive relationship between moderating environmental factors and the performance of mango projects (r=0.668, p=0.000). This implies that there isa very strong relationship between the two variables. Based on these data, the null hypothesis was rejected, and it was decided that there was a significant relationship between the variables.

Model 7

Mango's performance, as dependent variable, is a function of f (environmental variables), and regression model seven is:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, \varepsilon)$,
$Y = \alpha + \beta_0X_1 + \beta_1X_2 + \beta_2X_3 + \beta_3X_4 + \beta_4X_5 + \beta_5X_6 + \beta_6X_7 + \varepsilon$,
$Y = \alpha + \beta_0X_7 + \varepsilon$,
Model 7: $Y = f(X_7, \varepsilon)$.

Testing of Environmental Factors on Relationship between Participatory Project Life Cycle and Mango Performance

It was tested using simple linear regression. Table 3.3 summarizes the findings:

Table 3.3: Environmental Factors on the Relationship between Participatory Project Life Cycle and Mango Projects Performance

Model Summary						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		.324(a)	0.124	0.0632	11.332	
ANOVA (b)						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	63.21	2	33.21	9.23	.000(a)
	Residual	22.11	367	12.33		
	Total	85.32	369			

Coefficients (a)						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	4.33	2.127		9.172	0
	Environmental factors (X_7)	2.12	0.211	0.213	6.511	0

1. **Dependent Variable: performance of mango farming projects**
2. **Predictor Variable: environmental factors**

Table 3.3 shows the following results: DF (2,367), F =9.23, t=6.511, P=0.000<0.05, r=.324 and R square = 0.124. The test was statistically significant at both the 5% and 95% levels of significance, and hence the null hypothesis was rejected. The adjusted R squared is 0.0632, indicating that environmental variables affected 6.3% of the changes in mango farming project performance, whereas other factors accounted for 93.7% of the variance. The ANOVA results showed that the predictive model was statistically significant, with F (2,367) = 9.23, and the linear regression model is Y= 4.33 + 2.12X_7. With a beta of 2.12, increasing environmental factors by one unit increased mango performance by 2.12, and vice versa. Environmental factors, according to the study, influenced mango performance. The null hypothesis $H0_7$ is rejected as a result of these findings. According to the statistics, there was a significant correlation between environmental factors and mango performance.

There was no significant relationship between environmental factors and mango performance, as per Table The findings were DF (2, 367), F=9.23, t=6.511, P=0.000<0.05, and R square= 0.124. Because therewas a significant correlation between environmental factors and mango performance, the null hypothesiswas rejected. The study was to establish the extent to which environmental factors moderated the relationship between participatory project management life cycle and mango performance. The inferential statistics showed a positive relationship between the influence of environmental factors on the participatory project management life cycle and mango projects. From the interviews conducted and the key informants' views, it is evident that there was a significant positive relationship between the variables. The studyconcludes that all the variables in this study significantly influenced the performance of mango farming projects.

Environmental factors collectively are inevitable in the performance of mango projects and were composed of natural and human-induced actions that affected performance. Mango farming projects are part and parcel of agricultural projects essential for addressing food insecurity and greening the surroundings to control environmental degradation and enhance water catchment tower ecosystems. Mango trees, just like many deciduous and perennial trees, can intervene in zoned ecosystems by preserving water catchment towers and alleviating climate change and global warming problems experienced the most in developing countries. Mango trees can absorb the forces of nature by being human-made carbon sequestration sinks for trapping excess carbon in the atmosphere, which would be the best way of trapping carbon besides maximizing mango production. Mango farming projects are an essential environmental greening process for mitigating the adverse effects of frequent droughts, climate change, and global warming in Makueni County. The preharvest and postharvest choices of mango farmers' marketing channels revealed that mango farming projects could assist in mitigating food insecurity, rampant food shortages, and the declining agricultural potential of staple food crops.

CONCLUSION

Mango trees can absorb the forces of nature by being human-made carbon sequestration sinks for trapping excess carbon in the atmosphere, which would be the best way of trapping carbon besides maximizing mango production. Mango farming projects are an essential environmental greening process for mitigating the adverse effects of frequent droughts, climate change, and global warming in Makueni County. The

preharvest and postharvest choices of mango farmers' marketing channels revealed that mango farming projects could assist in mitigating food insecurity, rampant food shortages, and the declining agricultural potential of staple food crops. To improve mango performance, the government and professionals must work together to address environmental sustainability issues at the beginning of the project cycle. Mango trees act as a people-centred greening activity for reducing the effects of recurrent droughts, climate change, and global warming in an uncertain project environment. Mango trees hold enormous economic potential, both now and in the future.

RECOMMENDATION

A resilient and robust environmental policy must be undertaken and implemented to mitigate thedegradation of the environment in mango-growing areas. Mango trees have the potential to act as carbonsequestration sinks in already unstable environments, so it is vital to promote mango cultivation. Moreresearch is needed to understand the long-term viability of the dynamic project environments where peoplemake a living out of nature.

REFERENCES

1. Adesina, T. K., & Eforuoku, F. (2016). Determinants of Participation in Youth-in-Agriculture Programme in Ondo State, Nigeria, Journal of Agricultural Extension, ISSN: (e) 24086853, ISSN (Print) 1119944X. https://www.ajol.info/index.php/jae/article/view/149326.
2. Agbazue, V.E., & Ehiemobi, M.C. (2016). Centre for Environmental Management and Control (CEMAC), Enugu Campus, University of Nigeria. The Challenges of the Environmental Impact Assessment Practice in Nigeria, published in the International Journal of Scientific Research Engineering & Technology (IJSRET), ISSN 2278 – 0882 Volume 5, Issue 6, June 2016.
3. Ambuko, J (2019). Senior lecturer and postharvest specialist, Department of Plant Science and Crop Protection, University of Nairobi, https://www.hortinews.co.ke/2019/01/30/exploiting-the-value-of-mango-fruit-during-peak-season.
4. Boakye, L.G., (2014). African Studies Association of Australasia and the Pacific – AFSAAP 36th Annual Conference – Perth – Australia – 26-28 November 2013 Conference Proceedings (Publication Date February 2014) African Renaissance and Australia.
5. Burz, R. D., (2013). "The Concept of Performance," SEA – Practical Application of Science, Romanian Foundation for Business Intelligence, Editorial Department, issue 1, pages 255-261, June, 2013.
6. Cherry, R. (1995). The Culture-of-Poverty Thesis and African Americans: The Work of Gunnar Myrdal and Other Institutionalists. Journal of Economic Issues, 29(4), 1119-1132. Retrieved May 29, 2021, from http://www.jstor.org/stable/4227025.
7. Choudhary, M. P, Chauhan, G. S & Kushwah, Y. K (2015) Environmental Degradation: Causes, Impacts and Mitigation, Conference: National Seminar on Recent Advancements in Protection of Environment and its Management Issues (NSRAPEM-2015) At: Maharishi Arvind College of Engineering and Technology, Kota, Rajasthan, India.
8. Chu, E.W & Karr, R.J, (2013). Environmental Impact, Concept and Measurement ofEncyclopedia of Biodiversity, 2013, Pages 278-296.
9. Cisco, O.B., & Olungah, C.O., (2016). Factors Affecting Rural Women's Participation in Agriculture for Development in Gatundu South Sub County, Kiambu County, Kenya. International Review of Social Sciences and Humanities Vol. 11, No. 2 (2016), pp. 97-107 www.irssh.com, ISSN 2248-9010 (Online), ISSN 2250-0715 (Print). http://www.irssh.com/yahoo_site_admin/assets/docs/8_IRSSH-1340-V11N 2.2 491 05418.pdf.
10. Clark, W.C. and R.E. Munn (1986): "Sustainable Development of the Biosphere". Cambridge University Press, Cambridge, 1986.
11. Coomer J. C (1979). "Quest for a Sustainable Society", management of sustainable growth" by Woodlands Conference on Growth Policy 1979.

http://www.kennuncorked.com/sustainable_defined.html.

12. Cotula, Lorenzo, & Sonja Vermeulen. (2009). Land grabs in Africa: Can the deals work for development? London: International Institute for Environment and Development. IIED Brie?ng September 2009.
13. Doran, G.T., (1981). There is S.M.A.R.T. way to write management's goals and objectives. Management Review (AMA FORUM) 70 (11): 35–36.
14. Dubin, Simon (1976). https://books. Google.co.ke/books?Id=JUKTMx8ZeKsC&pg=PA9&dq=meaning +of+theoretical+and+conceptual+framework+by +Dublin+in+1976&source.
15. El Makawy A. I., Ashoush I. S. & Abed-Elmoneim O. M,(2015). Evaluation of Mango By-product Extracts as Antioxidant Against Pb-Acetate-Induced Oxidative Stress and Genotoxicity in MicPol. J. Food Nutr. Sci., 2015, Vol. 65, No. 1, pp. 39–47 DOI: 10.1515/pjfns-2015-0009 http://journal.pan.olsztyn.pl.
16. Elkington, J. (1994) 'Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development'. California Management Review 36 (2), 90-100.
17. Elkington, J. B., (1999). Environmental excellence, green growth, green consumer, the triple bottom line and People, Planet & Profit (or Prosperity). http://johnelkington.com/.
18. Elkington, J. (1999) Cannibals with Forks: Triple Bottom Line of 21st Century Business. Oxford: Capstone Publishing.
19. FAO (2007). Approaches to linking producers to markets, Andrew W. Shepherd Agricultural Management, Marketing and Finance Service FAO Rural Infrastructure and Agro-Industries Division, Food and Agriculture Organization of the United Nations, Rome, 2007. http://www.fao.org/3/a-a1123e.pdf.
20. FAO, (2015). The economic lives of smallholder farmers an analysis based on household data from nine countries. Food and Agriculture Organization of the United Nations, Rome, 2015, http://www.fao.org/3/a-i5251e.pdf.
21. Farmbizafrica (2018). Mango juice factory to benefit 12,000 Makueni mango farmers. http://farmbizafrica .com/markets/2010-mango-juice-factory-to-benefit-12-000-makueni-farmers.
22. Freshplaza, (2019). Kenya: Enhance value addition mango farming. https://www.freshplaza. com/article/9066388/kenya-enhance-value-addition-mango-farming/.
23. Franco, I. B and Masato, A. (2017. Socially Responsible Business: A Model for a Sustainable, Future Publisher: UNESCAPISBN: 978-92-1-120757-6
24. FSD Kenya, (2015). Opportunities for financing the mango value chain: a case study of Lower Eastern Kenya, contribution of William Grant – DAI, Esther Kadondi, Michael Mbaka and Silas Ochieng, http://s3-eu-central-1.amazonaws.com/fsd-circle/wp-content/uploads/2015/08/30093918/15-06-29-Mango-value-chain-report.pdf.
25. Gitahi, R., Kasili, T., Kyallo, M & Kehlenbeck, K (2016). Diversity of threatened local mango landraces on smallholder farms in Eastern Kenya, Forests, Trees and Livelihoods, 25:4, 239-254, DOI: 10.1080/14728028.2016.1201436. ISSN: 1472-8028 (Print) 2164-3075 (Online) Journal homepage: https://www.tandfonline.com/loi/tftl20.
26. GRAIN, (2008). Seized: The 2008 Land Grab for Food and Financial Security'. Barcelona: Grain.
27. Greenpeace, (2009). Greenpeace International, OtthoHeldringstraat 5, the Netherlands. https://courses.edx.org/c4x/DelftX/RI101x/asset/hfcs-a-growing-threat_greenpeace.pdf.
28. Hart, T., Burgess, R., Beukes, O & Hart, C (2005). Reducing Pitfalls in Agricultural Development Projects: A Case for the Participatory Project Management Cycle (PPMC), S. Afr. Tydskr. Landbouvoorl. /S. Afr. J. Agric. Ext., Hart, Burgess, Beukes & Hart, ISSN 0301-603X, Vol 34(1), 2005.
29. Hart, T., Burgess, R., & Cornel, H., (2005). A participatory project management cycle: can it add value to agricultural development? South African Journal of Agricultural Extension ISSN 0301-603X, Vol. 34(2) 2005: 201-220, https://www.ajol.info/index.php/sajae/article/view/3670.
30. Hansen, Tuan &Somwaru, (2011). Jim Hansen, Francis Tuan, AgapiSomwaru, (2011) "Do

China's agricultural policies matter for world commodity markets?" China Agricultural Economic Review,Vol. 3 Issue: 1, pp.6-25, https://doi.org/10.1108/17561371111103516.

31. Husar, R., (2015). Ecosystem and the biosphere: metaphors for human-induced material flows, Center for Air Pollution Impact and Trend and Trend Analysis (CAPITA). Chapter in "Industrial Metabolism: Restructuring for Sustainable Development", by Robert U. Ayres and Udo E. Simonis, (eds.), United Nations University Press, 1994.
32. Jisheng, Y., (2013). "Tombstone: The Great Chinese Famine, 1958–1962". Book Review. New York Times. Dec, 2012. 3 March 2013. https://www.nytimes.com/2012/12/09/books/review/tombstone-the- great-chinese-famine-1958-1962-by-yang-jisheng.html.
33. Jorna R.J. (2004). Lecture presented at NIAS (www.nias.nl) (Netherlands Institute for Advanced Science): The concept of "Sustainability "and Sustainable Innovation: An attempt to reconceptualise Sustainability.
34. Kehlenbeck K, Rohde E, Njuguna J.K, Jamnadass R., (2012). Mango: cultivation in different countries. In: Sudha GV, Rajmohan K, Govil JN, Peter kV, Thottappilly G, editors. Mango production in Kenya. Vol. 2. Houston, TX:Studium Press LLC; p. 186–207.
35. Kenya Constitution (2010). Http://kenyalaw.org/kl/fileadmin/pdfdownloads/bills/2018/ Public Participation Bill_ 2018.pdf
36. Kenya Vision 2030 (2008). https://vision2030.go.ke.
37. Kraaijenbrink J., (2020). What the 3Ps of the Triple Bottom Line Really Mean, https://www.forbes.com/ sites/jeroenkraaijenbrink/2019/12/10/what-the-3ps-of-the-triple-bottom-line-really-mean/#465d097a5143.
38. Kaneene, J.B., Haggblade, S., &Tschirley, D.L., (2015). "Special issue introduction: Sub-Saharan Africa's agri-food system in transition", Journal of Agribusiness in Developing and Emerging Economies, Vol. 5 Issue: 2, pp.94-101, https://doi.org/10.1108/JADEE-02-2015-0012.
39. Leahy, S., (2009). Agriculture: Foreigners lead global land rush. Inter Press Service News. 5 May. http://www.ipsnews.net/news.asp?idnews.
40. Lakitan B., (2018). "Research and technology development in Southeast Asian economies are drifting away from agriculture and farmers' needs", Journal of Science and Technology Policy Management, https://doi.org/10.1108/JSTPM-11-2017-0061.
41. Lewis, J., (2007). Project Planning, Scheduling & Control, 3rd Edition ISBN-10: 0071360506 ISBN-13: 978-0071360500. https://www.amazon.com/Project-Planning-Scheduling-Control-3rd/dp/0071360506.
42. Makate C., Makate, M. & Mango, N (2018). Farm household typology and adoption of climate-smart agriculture practices in smallholder farming systems of southern Africa, African Journal of Science, Technology, Innovation and Development, 10:4, 421-439, DOI: 10.1080/20421338.2018.1471027, ISSN: 2042-1338 (Print) 2042-1346 (Online) Journal homepage:https://www.tandfonline.com/loi/rajs20.
43. Mele P. V., Nguyen T. T. C. & Huis A. V. (2001). Farmers' knowledge, perceptions and practices in mango pest management in the Mekong Delta, Vietnam, International Journal of Pest Management, 47:1, 7-16, DOI: 10.1080/09670870150215559, 2001, 47(1) 7± 16, ISSN0967-0874print/ISSN1366-5863online.
44. Mango Infopedia (2017). http://eresources.nlb.gov.sg/infopedia/articles/SIP_872_2005-01-11.html#commentForm. An electronic encyclopaedia on Singapore's history, culture, people and events, National Library Board, Singapore.
45. Mbithe, M. M., (2012). Factors Influencing Mango Value Addition in Kenya: A Case of Group Projects in Makueni County, a thesis undertaken at the University of Nairobi, 2012.
46. MIF, (2010). Mango as an opportunity for long-term economic growth in Haiti, Document of the Inter-American Development Bank Multilateral Investment Fund, Donors Memorandum.
47. Mulinge W. (2015). Thesis by Wellington Kasee Mulinge on factors influencing grafted mango (mangiferaindica l.), Production in Matinyani Division, Kitui County. South Eastern Kenya

University, June 2015.
48. Normand, F., Lauri, P.E., & Legave, J.M. (2015). Climate Change and its Probable Effects on Mango Production and Cultivation. Acta Hortic. 1075, 21-31 DOI: 10.17660/ActaHortic.2015.1075.1.
49. Osena, E.D (2011). An Analysis of the Mango Fruit Value Chain in Embu, Emily Dorothy Osena, University of Nairobi, 2011.
50. PIM, (2018) Plantation International Mangoes., https://www.plantationsinternational.com/mango.
51. Purushottam B., (2015). Challenges facing mango cultivators of India and the feasible solutions. International Journal of Management and Development Studies 4(3): 250-255 (2015) ISSN (Online): 2320-0685. ISSN (Print): 2321-1423.
52. PMI's PMBOK (1996). Project Management Institute's, Project Management Book of Knowledge.
53. Rahman M. S., Khatun, M. A. &Monayem M., (2019). Profitability analysis of mango cultivation and its impact on farmer's livelihood in some areas of Bangladesh. ISSN 0258-7122 (Print), 2408-8293 (Online) Bangladesh J. Agril. Res. 44(1): 139-152, March 2019.
54. Ravishankar, H. &Misra, A.K. (2010). Good management practices for mango production and trade.
55. Rehman, A., Malik, A.U., Ali, H., Alam, M.W & Sarfraz B., 2015. Preharvest factors influencing the postharvest disease development and mango fruit quality. Journal of Environmental &Agricultural Sciences. 3:42-47.
56. Ronnie, S. N., Irlan A. R., Lies S. &Zumi S., (2014). Improving the participation of smallholder mango farmers in modern retail channels in Indonesia, The International Review of Retail, Distribution and Consumer Research, 24:5, 564-580, DOI: 10.1080/09593969.2014.970212.
57. Sennhenn A, Prinz K, Gebauer J, Whitbread A, Jamnadass R, Kehlenbeck K. (2013). Identification of mango (Mangiferaindica L.) landraces from Eastern and Central Kenya using a morphological and molecular approach. Genet Res Crop Evol. 6:7–22.
58. Simiyu, N. R. (2018). Project Management Practices and Performance of Agricultural Projects by Community-Based Organizations in Bungoma County, Kenya. https://ir- library.ku.ac.ke/ bitstream/handle/123456789/18978/Project%20management……pdf?sequence=1&isAllowed
59. Simiyu, N.R., Ngugi, L., &Minja, D, (2018). The Influence of Project Planning and Implementation on the Performance of Agricultural Projects by Community Based Organizations in Bungoma County, Kenya. European Journal of Business and Management; ISSN (Paper) 2222-1905 ISSN (Online) 2222-2839, Vol 10, No 28 (2018), Simiyuhttps://iiste.org/Journals/ index.php/EJBM/article/view/44532.
60. Sridhar, R., Sachithanandam, V., Mageswaran, T., Purvaja, R., Ramesh R., Senthil A. V. & E. Thirunavukkarasu E (2016). A Political, Economic, Social, Technological, Legal and Environmental (PESTLE) approach for assessment of coastal zone management practice in India, International Review of Public Administration, 21:3, 216-232, DOI: 10.1080/12294659.2016.1237091.
61. Swart, R., Sedee, A.G.J., Pater, F., Pater, Goosen, H., Pijnappels, M., & Vellinga, P., (2014). Climate- Proofing Spatial Planning and Water Management Projects: An Analysis of 100 Local and Regional Projects in the Netherlands, Journal of Environmental Policy & Planning, 16:1, 55-74, DOI: 10.1080/1523908X.2013.817947.
62. Tharanathan, R.N., Yashoda, H.M. & Prabha, T.N. (2006). Mango (Mangifera Indica L.), "The Kingof Fruits"—an Overview, Journal of Food Reviews International Vol. 22: Issue 2, 95-123, DOI: 10.1080/87559120600574493.
63. Tharani, G., Akther, M.S.R., &Nanthakumaran, A., (2016). Assessment of Women Participation in Agriculture in Vavuniya District, Sri Lanka, Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka. 2Vavuniya Campus of the University of Jaffna, Sri Lanka. 15137-Article Text- 51373-1-10-20160723.pdf.
64. UN (2015). United Nations Sustainable Goals, https://www.un.org/sustainabledevelopment/wp-content/ uploads/2015/08/Factsheet_Summit.pdf.

65. UN women, (2018). Mango farmers in Kenya get access to new technology to counter post-harvest losses: https://www.un.org/africarenewal/news/mango-farmers-kenya-get-access-new-technology - counter-post-harvest-losses.
66. UN (2019). World Population Prospects 2019 of the United Nations, https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf.
67. USAID (2021). Agriculture and Food Security in Kenya. https://www.usaid.gov/kenya/agriculture-and-foodsecurity#:~:text=The%20agricultural%20sector%20is%20the,percent%20of%20the%20rural% 20 population.
68. Wallace, K.J., Behrendt, R., & Mitchell, M.L, (2016). Changing agricultural land use: evaluating the benefits and trade-offs, Australasian Journal of Environmental Management, 23:1, 36-50, DOI: 10.1080/14486563.2014.999727, https://doi.org/10.1080/14486563.2014.999727.
69. Wideman, R. M., (2001). Managing the Project Environment, A E W Services, Vancouver, B.C.,Canada. http://www.maxwideman.com/papers/projenviron/projenviron.pdf.
70. World Bank (2014). Kenyans Earn First Ever Carbon Credits From Sustainable Farming. https://www.worldbank.org/en/news/press-release/2014/01/21/kenyans-earn-first-ever-carbon-credits-from-sustainable-farming.
71. Yaro J. A., &Tsikata D., (2013). Savannah fires and local resistance to transnational land deals: the case of organic mango farming in Dipale, northern Ghana, African Geographical Review, DOI:10.1080/19376812.2012.759013.