

*Integrating Natural Resources Management for Efficacy*

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**Kariuki Muigua**

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# **Integrating Natural Resources Management for Efficacy**

**Kariuki Muigua\***

## **Abstract**

*Natural resources play a fundamental role in the life of human beings which may be classified as economic, social and cultural. The importance of natural resources therefore demands the effective use, access and management of natural resources for the benefit of present and future generations. Sustainable use and management for natural resources is therefore necessary for development. This paper discusses the need for integrating natural resources management for efficacy. It examines the concept of natural resources management. The paper explores various approaches adopted towards management of natural resources. It also highlights the strengths and weaknesses of such approaches. In addition, the paper offers suggestions towards integrating natural resources management for efficacy.*

## **1.0 Introduction**

The term natural resources refers to the functional utility that humanity derives from the environment<sup>1</sup>. In addition, the term natural resources describes products of biological, ecological, or geological processes that satisfy human wants<sup>2</sup>. It has further been noted that natural resources include all aspects of the environment which are not man-made and are of value to man such as forests, minerals, oceans, freshwater, soil and air<sup>3</sup>. The *Constitution of Kenya*<sup>4</sup> defines natural resources to mean the physical non-human factors and components, whether renewable or non-renewable, including sunlight; surface and

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<sup>1</sup> Bridge. G., 'Natural Resources' *International Encyclopedia of Human Geography*, 2009., pp 261-268

<sup>2</sup> Ibid

<sup>3</sup> Muigua. K., 'Natural Resources and Environmental Justice in Kenya' Glenwood Publishers Limited, 2015

<sup>4</sup> Constitution of Kenya., 2010., Government Printer, Nairobi

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groundwater; forests, biodiversity and genetic resources; and rocks, minerals, fossil fuels and other sources of energy<sup>5</sup>.

It has been noted that natural resources play a fundamental role in the life of human beings which may be classified as economic, social and cultural<sup>6</sup>. Economically, natural resources are not only a source of food and raw materials but are also a source of income for individuals and the state<sup>7</sup>. Socially, natural resources like water bodies play recreational role amongst others and also contribute to the improvement of the quality of life of individuals<sup>8</sup>. Culturally, communities especially in Africa attach importance to some natural resources that may be revered as shrines, dwelling places for ancestors and sacred sites where rites of passage and other cultural celebrations take place<sup>9</sup>.

According to the United Nations Environment Programme (UNEP), natural resources are the foundation of social and economic development<sup>10</sup>. Natural resources have also been described as the lifeblood of the world economy<sup>11</sup>. They are the essential material conditions and bases for economic development<sup>12</sup>. As a result, abundant natural resources are often regarded as a great advantage for a country's economic development, while resource shortage is associated with underdevelopment<sup>13</sup>.

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<sup>5</sup> Ibid, article 260

<sup>6</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>7</sup> Costanza. R., 'The Ecological, Economic, and Social Importance of the Oceans.' *Ecological Economics*, Volume 31, No. 2 (1999)

<sup>8</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit  
<sup>9</sup> Ibid

<sup>10</sup> United Nations Environment Programme., 'Sustainable Natural Capital' Available at <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/sustainable-natural> (Accessed on 25/03/2024)

<sup>11</sup> Bridge. G., 'Natural Resources' Op Cit

<sup>12</sup> Ibid

<sup>13</sup> Ibid

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The importance of natural resources therefore demands the effective use, access and management of natural resources for the benefit of present and future generations<sup>14</sup>. UNEP further notes that in order for all countries to reap the economic and social benefits inherent in their natural wealth, it is necessary to urgently address such issues as the management and the economic and environmental impacts related to their sustainable use<sup>15</sup>. Sustainable use and management for natural resources is therefore necessary for development<sup>16</sup>.

This paper discusses the need for integrating natural resources management for efficacy. It examines the concept of natural resources management. The paper explores various approaches adopted towards management of natural resources. It also highlights the strengths and weaknesses of such approaches. In addition, the paper offers suggestions towards integrating natural resources management for efficacy.

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<sup>14</sup> Child. B., et al. 'Zimbabwe's CAMPFIRE Programme: Natural Resource Management by the People.' *IUCN-ROSA Environmental Issues Series No. 2*, (1997)

<sup>15</sup> United Nations Environment Programme., 'Our work in Africa' Available at <https://www.unep.org/regions/africa/our-work-africa#:~:text=Africa%20is%20rich%20in%20natural,%2C%20minerals%2C%20forests%20and%20wildlife> (Accessed on 25/03/2024)

<sup>16</sup> Ibid

## **2.0 Approaches to Natural Resources Management**

Various approaches have been adopted towards managing natural resources. Key among them is the command and control approach<sup>17</sup>. It is one of the most commonly used approach towards environmental governance<sup>18</sup>. The command and control approach is based on standards or regulations<sup>19</sup>. Under this approach, the management of natural resources relies on laws, regulations and penalties<sup>20</sup>. It has been noted that such laws typically involve three elements: identification of a type of environmentally harmful activity, imposition of specific conditions or standards on that activity, and prohibition<sup>21</sup>. Further, it has been asserted that command and control approach is one where political authorities mandate people, by enacting a law, to bring about a behavior and use an enforcement machinery to get people to obey the law<sup>22</sup>. It involves the setting of standards to protect or improve environmental quality<sup>23</sup>. Under this approach, a standard is a mandated level of performance enforced through a piece of legislation<sup>24</sup>. The command and control approach embraces environmental quality standards such as ambient, emission and technology standards<sup>25</sup>.

This approach is embraced in Kenya under the *Environmental Management and Co-ordination Act*<sup>26</sup> which establishes the National Environment Management Authority (NEMA) as the body in charge of general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the

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<sup>17</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>18</sup> Ibid

<sup>19</sup> Ibid

<sup>20</sup> Davies. J.C., & Mazurek. J., 'Pollution Control in the United States: Evaluating the System' *Resources for the Future*, 1998, p 15

<sup>21</sup> Ibid

<sup>22</sup> Philippine Institute for Development Studies., 'A Law of Nature: The Command-and-Control Approach' Available at [https://sswm.info/sites/default/files/reference\\_attachments/PIDS%202002%20Standards%20in%20Command%20and%20Control.pdf](https://sswm.info/sites/default/files/reference_attachments/PIDS%202002%20Standards%20in%20Command%20and%20Control.pdf) (Accessed on 26/03/2024)

<sup>23</sup> Ibid

<sup>24</sup> Ibid

<sup>25</sup> Ibid

<sup>26</sup> Environmental Management and Co-ordination Act, No. 8 of 1999, Government Printer, Nairobi

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implementation of all policies relating to the environment<sup>27</sup>. The Act further sets out several environmental quality standards including water quality standards, air quality standards, standards for waste, and standards for noise<sup>28</sup>. There is also a number of sectoral laws which create specific standards and establish agencies to deal with particular natural resources in Kenya. They include the *Wildlife Conservation and Management Act*<sup>29</sup>, *Water Act*<sup>30</sup>, and the *Forest Conservation and Management Act*<sup>31</sup>. The command and control approach can be effective in environmental governance due to several reasons including the establishment of criminal sanctions for environmental harm and protection of the public from environmental malpractices such as pollution<sup>32</sup>.

Another major approach towards managing natural resources is the market based approach<sup>33</sup>. It has been noted that market-oriented environmental policies create incentives to allow firms or individuals to incorporate environmental conservation into their planning and operational processes<sup>34</sup>. Market-oriented approaches to environmental management include pollution charges, marketable permits, and better-defined property rights<sup>35</sup>. This approaches can be effective in managing natural resources. For example, a pollution charge is a tax imposed on the quantity of pollution that a firm emits<sup>36</sup>. It has been noted that this approach gives a profit-maximizing firm an incentive to figure out ways to reduce its emissions as long as the marginal cost of

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<sup>27</sup> Ibid, S 7 & 9

<sup>28</sup> Ibid, Part VIII

<sup>29</sup> Cap 376

<sup>30</sup> Cap 372

<sup>31</sup> Cap 385

<sup>32</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>33</sup> Ibid

<sup>34</sup> Khan Academy., 'What are Market-Oriented Environmental Tools?' Available at <https://www.khanacademy.org/economics-finance-domain/microeconomics/market-failure-and-the-role-of-government/environmental-regulation/a/market-oriented-environmental-tools-cnx#:~:text=Market%2Doriented%20environmental%20policies%20create,and%20better%2Ddefined%20property%20rights>. (Accessed on 26/03/2024)

<sup>35</sup> Ibid

<sup>36</sup> Ibid

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reducing the emissions is less than the tax<sup>37</sup>. Further, the ideal of property rights can provide private landowners with an incentive to protect endangered species on their land<sup>38</sup>. It has been noted that the use of market based approaches such as incentives can achieve the same level of natural resources protection as command and control approaches but they allocate the burden of this protection more efficiently among different stakeholders including corporations<sup>39</sup>.

Community Based Natural Resources Management (CBNRM) is another major approach towards managing natural resources<sup>40</sup>. This approach is characterized by a commitment to involve community members and local institutions in management of natural resources, devolution of power and authority to the grass roots, a desire to reconcile the objectives of socio-economic development and environmental conservation, the tendency to defend and legitimize local and indigenous property rights and a desire to include traditional values in modern management of natural resources<sup>41</sup>. It is premised on the view that sustainable management of natural resources is most likely where local communities are able to manage and derive benefits from natural resources<sup>42</sup>. It has been noted that CBNRM is a major global strategy for enhancing environmental conservation outcomes while also seeking to improve rural livelihoods<sup>43</sup>. It is a modern attempt to revive indigenous mechanisms for the conservation of natural resources<sup>44</sup>. It has been

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<sup>37</sup> Ibid

<sup>38</sup> Ibid

<sup>39</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>40</sup> Ibid

<sup>41</sup> Nelson F. & Agrawal, A., "Patronage or Participation? Community-based Natural Resource Management Reform in Sub-Saharan Africa," *Journal of Development and Change*, Vol. 39, No.4, 2008

<sup>42</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>43</sup> Pailler. S et al., 'Impacts of Community-Based Natural Resource Management on Wealth, Food Security and Child Health in Tanzania' Available at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0133252> (Accessed on 26/03/2024)

<sup>44</sup> Nelson F. & Agrawal, A., "Patronage or Participation? Community-based Natural Resource Management Reform in Sub-Saharan Africa," Op Cit

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argued that giving local communities the rights to manage, use or own resources, creates incentives for them to collectively invest in natural resources management<sup>45</sup>.

Ecosystem based approaches are also key in managing natural resources<sup>46</sup>. It has been noted that an ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way<sup>47</sup>. It is based on appropriate scientific methodologies focused on levels of biological organization encompassing essential processes and interactions among organisms and their environment<sup>48</sup>. This approach recognizes human beings and their cultural identities as integral components of ecosystems<sup>49</sup>. It has been pointed out that Integrated Water Resource Management (IWRM) and Integrated Coastal Zones Management (ICZM) are some of the key examples of ecosystem-based approaches to natural resource management<sup>50</sup>. According to UNEP, Integrated ecosystem-based management seeks to balance ocean, coastal, and freshwater resource use with conservation while acknowledging ecosystem connectivity<sup>51</sup>. It involves coordinated land and sea activity management to minimize cumulative impacts on marine and coastal ecosystems<sup>52</sup>. It has been noted that this approach overcomes limitations of single-sector strategies, offering holistic human-ecosystem interaction management<sup>53</sup>.

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<sup>45</sup> Ibid

<sup>46</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>47</sup> Ibid

<sup>48</sup> Ibid

<sup>49</sup> Ibid

<sup>50</sup> Ibid

<sup>51</sup> United Nations Environment Programme., 'Ecosystem-Based Approaches' Available at <https://www.unep.org/topics/ocean-seas-and-coasts/ecosystem-based-approaches#:~:text=Integrated%20ecosystem%2Dbased%20management%20seeks,on%20marine%20and%20coastal%20ecosystems>. (Accessed on 26/03/2024)

<sup>52</sup> Ibid

<sup>53</sup> Ibid

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The foregoing approaches have contributed to the efficient management of natural resources<sup>54</sup>. However, there are some underlying challenges with these approaches. For example, under the command and control approach, it has been noted that penalties for violating standards tend to be too low and enforcement tends to be weak<sup>55</sup>. Further, under this approach, there are complications and other considerations that have to be addressed such as the level of standards, uniformity of standards, equity effects and enforcement<sup>56</sup>. In addition, it has been posited that the use of market based approaches such as incentives may be limited since such approaches do not fit to every problem<sup>57</sup>. Uniform application of incentives does not categorically consider varying performance levels of environmental malpractices such as pollution thereby ignoring the efficiency principle<sup>58</sup>. It has further been noted that there may be bureaucratic obstacles to the successful use of incentives including the difficulties of the economic calculations involved<sup>59</sup>. Use of CBNRM also raises concerns over how to structure participation and representation<sup>60</sup>. In light of these among other challenges, it has been correctly pointed out that there is need to integrate natural resources management for better environmental outcomes<sup>61</sup>.

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<sup>54</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>55</sup> Ibid

<sup>56</sup> Philippine Institute for Development Studies., 'A Law of Nature: The Command-and-Control Approach' Op Cit

<sup>57</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>58</sup> Philippine Institute for Development Studies., 'A Law of Nature: The Command-and-Control Approach' Op Cit

<sup>59</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>60</sup> Robinson. L. W et al., 'The Challenges of Community-Based Natural Resource Management in Pastoral Rangelands' Available at <https://www.tandfonline.com/doi/full/10.1080/08941920.2021.1946629> (Accessed on 26/03/2024)

<sup>61</sup> Morrison. T. H., McDonald. G. T., & Lane. M. B., 'Integrating Natural Resource Management for Better Environmental Outcomes' Available at <https://www.tandfonline.com/doi/full/10.1080/0004918042000311304> (Accessed on 26/03/2024)

### **3.0 Integrating Natural Resources Management**

It has been noted that natural resources are embedded in complex social-ecological systems with a multitude of components, functions, and subsystems interacting across multiple levels and scales<sup>62</sup>. As a result, it has been asserted that effective environmental policies and programmes need to be informed by a comprehensive understanding of the biophysical, social, and economic components and processes of a system, their complex interactions, and how they respond to different changes<sup>63</sup>. The recognition of this complexity, and the uncertainty that comes with it, has led to the recognition that the management of natural resources demands integrated approaches<sup>64</sup>. Integrating natural resources management is necessary due to severe problems of fragmented policies and uncoordinated implementation which undermine natural resource management<sup>65</sup>.

Efforts towards managing natural resources are currently curtailed by several problems including climate change<sup>66</sup>. It has been noted that climate change is putting enormous pressure on the sustainability and availability of natural resources such as fresh water food production, and energy<sup>67</sup>. It has correctly been pointed out that in low-income countries, populations rely on natural resources such as water, land, forests, soil, wildlife, and fisheries for survival<sup>68</sup>. However, climate change is threatening these benefits as extreme weather events such as intense droughts and floods and slow-onset climate impacts degrade ecosystems and natural resources many of which are conserved and

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<sup>62</sup> Tengberg. A., & Valencia. S., 'Integrated Approaches to Natural Resources Management – Theory and Practice' Available at [https://www.researchgate.net/publication/324124744\\_Integrated\\_approaches\\_to\\_natural\\_resources\\_management-Theory\\_and\\_practice](https://www.researchgate.net/publication/324124744_Integrated_approaches_to_natural_resources_management-Theory_and_practice) (Accessed

<sup>63</sup> Ibid

<sup>64</sup> Ibid

<sup>65</sup> Morrison. T. H., McDonald. G. T., & Lane. M. B., 'Integrating Natural Resource Management for Better Environmental Outcomes' Op Cit

<sup>66</sup> United Nations Economic Commission for Europe., 'United Nations Resource Management System Principles and Requirements' Available at [https://unece.org/sites/default/files/2023-02/2229237\\_E\\_ECE\\_ENERGY\\_144\\_WEB.pdf](https://unece.org/sites/default/files/2023-02/2229237_E_ECE_ENERGY_144_WEB.pdf) (Accessed on 26/03/2024)

<sup>67</sup> Ibid

<sup>68</sup> Natural Resource Management., Available at <https://www.climatelinks.org/sector/natural-resource-management> (Accessed on 26/03/2024)

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sustainably managed by Indigenous Peoples and local communities<sup>69</sup>. Other key challenges including loss of biodiversity and pollution are a major threat to the sustainability of natural resources<sup>70</sup>. In light of these challenges, it has been argued that it is necessary to strengthen natural resource management in order to mitigate and reduce climate risks and build local capacity for resilience and resource sharing, including through socio-ecological approaches<sup>71</sup>. Therefore, a new model of integrated and sustainable management of natural resources that promotes resource efficiency and accelerates progress towards combating climate change is now becoming more urgent<sup>72</sup>.

Integrating natural resources management entails responsible and broad-based management of land, water, forest, biological resources among other natural resources in order to foster sustainability<sup>73</sup>. This concept has been defined as a conscious process of incorporating multiple aspects of natural resource use into a system of sustainable management<sup>74</sup>. It aims to achieve various goals including reducing poverty, increasing food security and achieving environmental protection<sup>75</sup>. It has been noted that integrating natural resources management focuses on ecosystems rather than commodities<sup>76</sup>; on underlying processes (both biophysical and socioeconomic) rather than simple relationships<sup>77</sup>; and on managing the effects of interactions between various elements of an ecosystem<sup>78</sup>.

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<sup>69</sup> Ibid

<sup>70</sup> United Nations Climate Change., 'What is the Triple Planetary Crisis?' Available at <https://unfccc.int/news/what-is-the-triple-planetary-crisis> (Accessed on 26/03/2024)

<sup>71</sup> Natural Resource Management., Op Cit

<sup>72</sup> United Nations Economic Commission for Europe., 'United Nations Resource Management System Principles and Requirements' Op Cit

<sup>73</sup> Hagmann, J. R., et al 'Success Factors in Integrated Natural Resource Management R&D: Lessons from Practice.' *Conservation Ecology*, Volume 5, No. 2: 29.

<sup>74</sup> Centre for International Forestry Research., 'Integrated Natural Resource Management Research in the CGIAR' Available at [https://www.cifor.org/publications/pdf\\_files/Books/INRM2000.pdf](https://www.cifor.org/publications/pdf_files/Books/INRM2000.pdf) (Accessed on 27/03/2024)

<sup>75</sup> Ibid

<sup>76</sup> Ibid

<sup>77</sup> Ibid

<sup>78</sup> Ibid

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Integrating natural resources management is a model that is uniquely suited to managing complex natural resource management challenges in densely settled areas where people are highly dependent on local resources for their livelihoods, thus heightening the tension between livelihood and conservation aims<sup>79</sup>. This idea aims to foster environmental protection, and social well-being<sup>80</sup>. Integrating natural resources management seeks to achieve the objectives of environmental protection and social well-being through: fostering sustainable management of natural resources including land, water, forests and fisheries<sup>81</sup>; enhancing local adaptive capacity while supporting adaptive management beyond community level<sup>82</sup>; emphasizing sustainable livelihoods<sup>83</sup>; and effectively solving problems related to the management of natural resources<sup>84</sup>. Integrating natural resources management is therefore necessary for sound, adaptive management of natural resources<sup>85</sup>.

The *Report of the World Commission on Environment and Development*<sup>86</sup> notes the importance of integrating natural resources management. According to the Report, a new approach towards managing natural resources in which all nations aim at a type of development that integrates production with resource conservation and enhancement, and that links both to the provision for all of an adequate livelihood base and equitable access to resources is necessary for Sustainable Development<sup>87</sup>. The Report acknowledges the importance of integrating the management of natural resources such as forests, land, and oceans<sup>88</sup>.

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<sup>79</sup> German. L., Mowo. J., & Opondo. C., 'Integrated Natural Resource Management: From Theory to Practice' Integrated Natural Resource Management in the Highlands of Eastern Africa, International Development Research Centre., 2012

<sup>80</sup> Ibid

<sup>81</sup> Ibid

<sup>82</sup> Ibid

<sup>83</sup> Ibid

<sup>84</sup> Ibid

<sup>85</sup> Ibid

<sup>86</sup> World Commission on Environment and Development., 'Our Common Future.' Oxford, (Oxford University Press, 1987)

<sup>87</sup> Ibid

<sup>88</sup> Ibid

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Integrating natural resources management is also a key target under the United Nations 2030 *Agenda for Sustainable Development*<sup>89</sup>. The agenda sets out the need to protect the planet from degradation, including through sustainable consumption and production, *sustainably managing its natural resources*, and taking urgent action on climate change, so that it can support the needs of the present and future generations (Emphasis added)<sup>90</sup>. It identifies key threats to natural resources including resource depletion, and adverse impacts of environmental degradation, including desertification, drought, land degradation, freshwater scarcity, loss of biodiversity, and climate change<sup>91</sup>. The 2030 Agenda for Sustainable Development urges states to *integrate* ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies (Emphasis added)<sup>92</sup>.

The *African Convention on the Conservation of Nature and Natural Resources*<sup>93</sup> also sets out the need for integrating natural resources management in Africa. It urges parties to take effective measures to prevent land degradation, and to that effect develop long-term *integrated strategies* for the conservation and sustainable management of land resources, including soil, vegetation and related hydrological processes<sup>94</sup>. It also urges parties to implement policies for the planning, conservation, management, utilization and development of water *including integrated management of water resources* (Emphasis added)<sup>95</sup>.

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<sup>89</sup> United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (Accessed on 27/03/2024)

<sup>90</sup> Ibid

<sup>91</sup> Ibid

<sup>92</sup> Ibid

<sup>93</sup> African Union., 'African Convention on the Conservation of Nature and Natural Resources' Available at [https://au.int/sites/default/files/treaties/41550-treaty\\_Charter\\_ConervationNature\\_NaturalResources.pdf](https://au.int/sites/default/files/treaties/41550-treaty_Charter_ConervationNature_NaturalResources.pdf) (Accessed on 27/03/2024)

<sup>94</sup> Ibid

<sup>95</sup> Ibid

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Further, the Convention urges parties to integrate conservation and management of natural resources into national and local development plans<sup>96</sup>.

Integrating natural resources management is efficacious in fostering sustainability<sup>97</sup>. This process can improve livelihoods, agro-ecosystem resilience, agricultural productivity and environmental services at community, national, regional and global levels<sup>98</sup>. Integrating natural resources management has been effectively utilized to manage natural resources such as water, forests and coastal zones<sup>99</sup>. With regard to water resources, it has been observed that Integrated Water Resources Management aims at ensuring the coordinated development of water, land and related resources to optimise economic and social welfare without compromising the sustainability of environmental systems<sup>100</sup>. It is a systematic process for the Sustainable Development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives<sup>101</sup>. This approach differs from the sectoral approach to the management of water resources which leads to uncoordinated water resource development and management, resulting in conflict, waste and unsustainable systems<sup>102</sup>. It has been correctly asserted that Integrated Water Resources Management can go a long way in

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<sup>96</sup> Ibid

<sup>97</sup> Thoma. R et al., 'Towards Integrated Natural Resources Management (INRM) in Dry Areas Subject to Land Degradation: The Example of The Khanasser Valley in Syria' Available at [https://www.google.com/url?sa=i&url=https%3A%2F%2Flib.icimod.org%2Frecord%2F13678%2Ffiles%2F3742.pdf&psig=AOvVaw1HB2Y2GSo2lp3AZ0F\\_LMLq&ust=1711611536298000&source=images&cd=vfe&opi=89978449&ved=0CAUQn5wMahcKEwjAhbD-95OFaxUAAAAAHQAAAAAQCA](https://www.google.com/url?sa=i&url=https%3A%2F%2Flib.icimod.org%2Frecord%2F13678%2Ffiles%2F3742.pdf&psig=AOvVaw1HB2Y2GSo2lp3AZ0F_LMLq&ust=1711611536298000&source=images&cd=vfe&opi=89978449&ved=0CAUQn5wMahcKEwjAhbD-95OFaxUAAAAAHQAAAAAQCA) (Accessed on 27/03/2024)

<sup>98</sup> Ibid

<sup>99</sup> Muigua. K., 'Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya' Available at <https://kmco.co.ke/wp-content/uploads/2019/01/Integrated-Natural-Resources-and-Environmental-Management-for-Sustainable-Development-in-Kenya-Kariuki-Muigua-January-2019.pdf> (Accessed on 27/03/2024)

<sup>100</sup> Global Water Partnership, "Integrated Water Resources Management", Global Water Partnership Technical Advisory Committee, Background Paper no.4, 2000

<sup>101</sup> Ibid

<sup>102</sup> Ibid

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realisation of Sustainable Development Goal (SDG) 6 which seeks to ensure availability and sustainable management of water and sanitation for all<sup>103</sup>.

Integrating natural resources management can also be effectively utilized in managing forests<sup>104</sup>. Integrated forest management refers to the management of forests for multiple societal demands such as wood production, biodiversity conservation, recreation, water and soil protection among other<sup>105</sup>. This approach has the potential to combine biodiversity conservation with wood production and other ecosystem services for large forest areas if compromises between different objectives are made, and to take advantage of synergies between those objectives<sup>106</sup>. Integrated forest management can foster the conservation of protected areas, good forest management, and forest landscape restoration<sup>107</sup>.

The approach of integrating natural resources management can also be utilized to manage land<sup>108</sup>. Integrated Land Management has been identified as a strategically planned approach to managing the use and development of the land resource, to reduce human induced impacts<sup>109</sup>. It has been noted that this approach can help countries to manage their land resources, while achieving sustainable utilization of all other natural resources such as water, forests, and wildlife<sup>110</sup>.

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<sup>103</sup> Muigua. K., 'Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya' Op Cit

<sup>104</sup> European Forest Institute., 'Advancing Biodiversity Conservation through Integrated Forest Management in Europe' Available at [https://efi.int/sites/default/files/images/governance/policy\\_brief\\_INFORMAR\\_oForest.pdf](https://efi.int/sites/default/files/images/governance/policy_brief_INFORMAR_oForest.pdf) (Accessed on 27/03/2024)

<sup>105</sup> Ibid

<sup>106</sup> Ibid

<sup>107</sup> Ibid

<sup>108</sup> World Bank Group., 'The Integrated Land Management: Case of the WAVES Program in Zambia' Available at [https://seea.un.org/sites/seea.un.org/files/1\\_integrated\\_land\\_management\\_presentation\\_20191117\\_ve r4.pdf](https://seea.un.org/sites/seea.un.org/files/1_integrated_land_management_presentation_20191117_ve r4.pdf) (Accessed on 27/03/2024)

<sup>109</sup> Ibid

<sup>110</sup> Ibid

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Integrating natural resources management can also be effectively applied in managing coastal zones<sup>111</sup>. It has been noted that coastal zones are faced by problems of poor planning and uncoordinated coastal development as a result of a sectoral approach in planning and management<sup>112</sup>; poor waste management<sup>113</sup>; declining water quality<sup>114</sup>; destruction and loss of coastal and marine habitats as a result of over-exploitation, poor land use practices, encroachment and unplanned and unregulated human settlements and urban development, amongst others<sup>115</sup>. Integrating Coastal Zone Management can foster effective planning and management of coastal ecosystems and resources, while taking into account traditional, cultural and historical perspectives and conflicting interests and uses, all within the limits set by natural dynamics<sup>116</sup>. It can foster the sustainable management and use of coastal zones, taking into account the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts<sup>117</sup>. It has been argued that adoption of this approach can foster the attainment of SDG 14 which seeks to enhance the conservation and sustainable use of the oceans, seas and marine resources for Sustainable Development<sup>118</sup>.

Integrating natural resources management is thus an effective tool for effective management of natural resources including water, forests, land, and coastal zones. It is necessary to embrace this approach for Sustainable Development.

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<sup>111</sup> Muigua. K., 'Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya' Op Cit

<sup>112</sup> Republic of Kenya., 'Integrated Coastal Zone Management Policy' Available at <https://www.nema.go.ke/images/Docs/Legislation%20and%20Policies/ICZM%20Draft%20Policy%20.pdf> (Accessed on 27/03/2024)

<sup>113</sup> Ibid

<sup>114</sup> Ibid

<sup>115</sup> Ibid

<sup>116</sup> Ibid

<sup>117</sup> Ibid

<sup>118</sup> Muigua. K., 'Integrated Natural Resources and Environmental Management for Sustainable Development in Kenya' Op Cit

#### **4.0 Conclusion**

Natural resources play fundamental economic, social, and cultural functions<sup>119</sup>. The importance of natural resources therefore demands the effective use, access and management of natural resources for the benefit of present and future generations<sup>120</sup>. Integrating natural resources management is necessary due to severe problems of fragmented policies and uncoordinated implementation which undermine natural resource management<sup>121</sup>. It can foster responsible and broad-based management of land, water, forest, coastal zones, biological resources among other natural resources in order to foster sustainability<sup>122</sup>. Integrating natural resources management for efficacy is the way to go towards Sustainable Development.

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<sup>119</sup> Muigua. K., Wamukoya. D & Kariuki. F., 'Natural Resources and Environmental Justice in Kenya.' Op Cit

<sup>120</sup> Ibid

<sup>121</sup> Morrison. T. H., McDonald. G. T., & Lane. M. B., 'Integrating Natural Resource Management for Better Environmental Outcomes' Op Cit

<sup>122</sup> Hagmann, J. R., et al 'Success Factors in Integrated Natural Resource Management R&D: Lessons from Practice.' Op Cit

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