# ENVIRONMENTAL PERFORMANCE INDEX (EPI): 2018

# NAROK COUNTY

## PREFACE

National Environment Management Authority (NEMA), recently domesticated the Environment Performance Index (EPI), a global tool, which measures performance in our State of Environment (SOE) and is the first step towards preparing Environmental Action Plans (EAP). The EPI is now part of the Report that the Cabinet Secretary for Environment and Forestry is obliged under EMCA CAP 387 to present to the National Assembly each year, applicable to both national and county level. The EPI ranks and compares County by County performance for select indicators, clearly illustrating where additional support, resource allocation and investment is needed. Maintained by Yale and Columbia University for the past 20 years, the Global EPI has ranked Kenya a "poor performer", currently at 130 out of 180 nations. This County brief, therefore, calls upon high level, County policy-oriented readership to work toward improve their grass root situation.

The Green Economic Strategy and Implementation Plan (GESIP), launched by the Ministry of Environment and Forestry in 2016, established that 40% of GDP and 70-80% of livelihoods are dependent on our natural resource base. Nature therefore underpins the Constitutional rights of every Kenyan to a health environment, improved well-being, employment and sustainable development. We see daily, growing reports of illegal anthropogenic pressures, over-exploitation, unregulated pollution and degradation eroding the quality of life of Kenyans. The very people who are causing this damage are our customers, our clients, "our voters". They need results! The EPI is designed to help us shape policy, bringing a green growth focus to national and county programs and plans.

The Constitution, in Schedule 4, laid out a two-tier system of government, placed emphasis on Devolved Environmental Functions (DEF) whereby County Governments are now responsible to implement EMCA CAP 387. The expectation is that Counties will use SOER to mainstream Environmental Action Plans (EAP) into their County Integrated Development Plans (CIDP). County EPIs therefore inform County Governments in a simple, easy to read, illustrative format, as to the "state of affairs", helping them to drive prioritization in budgetary decision making, and guiding fund allocation by the Commission for Revenue Allocation (CRA).

This Index provides a rich source of data and information that can be used by different audiences, particularly high-level political decision makers, County Executives and their donors. In subsequent years, it's expected that the County Environment Committee (CEC) will maintain the EPI database for the County Executive Member for Environment to inform political debate and dialogue, guiding County environmental governance, planning and budgeting. The EPI summarizes key messages of the County SOER, based on the Drivers, Pressures, State, Impact and Response (DPSIR) approach, describes trends, ascribes reasons for decline and lists the impacts of the anthropogenic pressures, and accordingly, recommending mitigation actions to fund.

The EPI is also a monitoring and accountability tool that both identifies the strong and weak points of environmental performance across sectors, and by County. It notes issues that require corrective actions or interventions needed from policy makers. At the same time, it respects the Constitution Article 42, that civil society and the public can hold duty bearers to account, using the EPI as a tool for a grass-root lobby to address weak spots. It fosters transparency, highlighting where policies need to give greater attention. It is also an important tool to assess on a regular basis the performance of sectors and Counties and could be used as part of sector or County Performance Contract, informing whether there is progression or regression over time.

We are indebted to the Danish Government, DANIDA for supporting the preparation of this report, and appreciate the NEMA technical team and acknowledge the many stakeholders who contributed.

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# COUNTY ENVIRONMENTAL PERFORMANCE INDEX: 2018

## 1. EXECUTIVE SUMMARY

### 1.1. What Purpose an EPI?

The Environment Performance Index (EPI) measures progress towards achieving 100% of a Sustainable Development target, helping to guide County and Sector policy, planners and decision makers to identify Counties with under-performing environment and natural resource management (E&NRM) sectors that need support, both politically and financially, and becomes a powerful lobby tool to increase investment, as needed.

### 1.2. How Well is the County Performing Overall?

The national EPI is 55.6%. The Narok County EPI is 51%, a below average performance, and placing its ranking as 33th out of 47 counties. The County is therefore in the category of below average performing counties, implying attention and investment is still needed in the E&NRM budgets of the CIDP.

### 1.3. How Well is the County Doing by Sector?

Of the 27 indicators in the National EPI, the 13 containing County databases are attached and the assessment of the County performance suggests, it is doing well in the following sectors, notably:

a.  Water stress is at 100%, implying adequate long term water endowment.
b.  Expenditure on E&NRM is a high 86% of target
c.  Literacy levels are at 76%, implying at this average education, >15's should understand E&NRM
d.  Tree cover loss is at low 83%, giving a 17% tree cover retention vs the 2000 baseline.

### 1.4. Where is the County in need of Support?

The attached 13 indicators, suggest, poor performing sectors in the County where attention is needed includes:

a.  Waste water treatment is at 0%, and needs attention.
b.  The health of 83% of households are exposed to poor indoor air quality pollution from cooking with fuelwood, and 83% from using paraffin for lighting, needs urgent attention.
c.  Capacity in E&NRM expertise is low 8% of target, needs attention
d.  Access to improved sanitation is a low77%, needs attention
e.  Access to solid waste is at 26%, needs upgrades.

### 1.5. Recommendations for Environmental Action Plan of the County Government CIDP

a.  County needs to invest in waste water management.
b.  Given the high number of households that are dependent on paraffin and fuelwood for cooking and lighting, investment is needed to promote more carbon efficient cook stoves and improved indoor ventilation to avoid respiratory health risks to women and young children exposed to black carbon and particulate matter in the kitchen.
c.  County needs to allocate more CIDP budget to E&NRM
d.  County needs to invest more on E&NRM capacity development
e.  County to increase solid waste management services
f.  County needs to upgrade the sanitation system.

## 2. COUNTY ENVIRONMENTAL PERFORMANCE INDEX (EPI): 2018.

### 2.1. How to Interpret EPI Scores

The Global Environmental Performance Index (EPI) has been domesticated by the National Environmental Management Authority (NEMA), and adapted to Kenyan conditions. The Kenyan Index reports national and county government performance in three areas: a) Environmental Health (ie air and water quality), b) Environmental Vitality (ie biodiversity and resource status) and c) Socio-economic Environment (ie. education and gender engagement). It is a State of the Environment (SOE) policy guide that looks at status of National and County service delivery and conditions that need additional support, resource allocation, investment and governance. It is a composite Index where the national EPI comprises 27 indicators of which 13 are County level indicators. The County number is lower because full data sets were not available.

The status of indicator is standardized across sectors, transformed for comparison to either % of population affected or % of land area involved (eg sanitation is measured as % of population, while forest cover is % of land area). Points are then allocated as per performance vs % towards a national target (100% being the ideal). A cumulative index of all sectors, add up on a weighted bias according to pre-determined judgement of the indicators relative importance and contribution to sustainable development, gives the national or County EPI.

### 2.2. How to Use the EPI to Inform Policy?

The EPI is a SOER, policy monitoring and accountability tool that both identifies strong and weak points of environmental performance across sectors as well as county by county. It notes issues that require corrective actions or interventions either by politicians, policy makers or planners. It also fosters transparency, highlighting where policies or budgets need to give greater attention to remedial solutions. It is designed as a compass, a pointer to draw high level attention to where additional political support, resource allocation, or donor investment is needed to improve livelihoods and human well-being. It does not attempt to explain the relationship and/or the impact of one variable on another, this would be the target of additional research.

### 2.3. Purpose of the County EPI Information Fact Sheet

The 13 County EPI Fact Sheets attached to this Report, are designed as a database to inform both national and county policy makers and planners, to help them at a glance to visualize the trends in E&NRM performance. It allows County Government to make comparison with their peers (ie County to County), and for sectors to assess in which County they are under-achieving. This information is for use by lobbyists to support their case either for policy change, or for justifying prioritization of investment needs during ADP budget debates.

### 2.4. Why a Kenyan EPI?

An EPI represents trends in the selected combination of a multiple of E&NRM sectors in the 3 policy categories. It allows a comparison between national and county performance towards achieving national goals (ie Vision 2030) and international standards (ie SDGs). The percentage measure of how close achievement is to target, is known as "proximity to target" (PTT) where 100% means "on target".

For the last 20 years, Yale and Columbia Universities have published a bi-annual global EPI, comparing 180 countries. Currently, Kenya is ranked 130, implying it is in the 25% "low performing category". In 2017, to re-address the situation, NEMA embarked on domesticating the tool to guide national and county planning, providing senior management with an insight into science based information for policy and decision making.

The EPI is part of the State of the Environment Report (SOER), presenting the national trend lines, with county by county performance comparison. The data is presented in a format whereby the connectivity between Drivers, Pressures, State and Impacts can easily be understood so as to illicit the right remedial Response (ie a process known as the "DPSIR approach" for SOER). The EPI is the first step in appraising the EAP performance whereby priority, appropriate mitigation actions can then be incorporated in National and County EAP, and mainstreamed into the County Integrated Development Plans (CIDP) and annual budgets.

## 2.5. How Policy Makers and Planners Can Use an EPI to Lobby for Resources?

An EPI is a tool whereby national and county policy makers and planners, their donors and NGOs can visualize performance trends and current status in any one of the selected priority E&NRM sector indicators. It helps the user to rapidly and visually assess County status vs national targets. County management can quickly pin-point in which sectors they are under-performing, and look at this as an opportunity to draw Ministry of Finance, the Commission for Revenue Allocation (CRA) or their donors attention to their situation.

The EPI helps make a strong case for where future investment is needed. The presentation as visual trends, info-graphics and GIS map can be easily interpreted by the National and County Assembly, and can be used by County Councilors to guide them in political decision making how best to serve their Constituencies.

The EPI, in accordance with EMCA CAP 387, 9(3) is presented alongside the Cabinet Secretary, Ministry of Environment and Forestry (MEF) **"Annual State of the Environment"** report to the National Assembly. This makes it a powerful tool for a budget lobby, and offers Counties the opportunity to input, to ensure the Medium Term Plan (MTP) is sensitive to County E&NRM concerns and supports under-performing Counties budget requests during appraisal of Annual Development Plans (ADP).

## 2.6. The Kenya EPI Framework Explained

The EPI framework as domesticated for Kenya and illustrated in the tables below includes:

a.  A National EPI Framework made up of 3 policy segments and 27 issue based indicators.
b.  The National EPI comparison is ranked as a total of 27 Sector Indicators, based on the SOER data.
c.  The County EPI performance, presents a County by County comparison ranked as a total of 13 indicators.

## 2.7. The Kenya EPI Fact Sheets Explained

The attached 47 County EPI Fact Sheets, presents the SOER database, highlighting trends for the 13 County E&NRM indicators, based on:

a.  SOER trends of the national performance by sector.
b.  The County EPI by sector, of all 47 counties, graphically ranked from best to lowest performance.
c.  GIS map of the County by performance level.
d.  And the DPSIR of the individual County status.
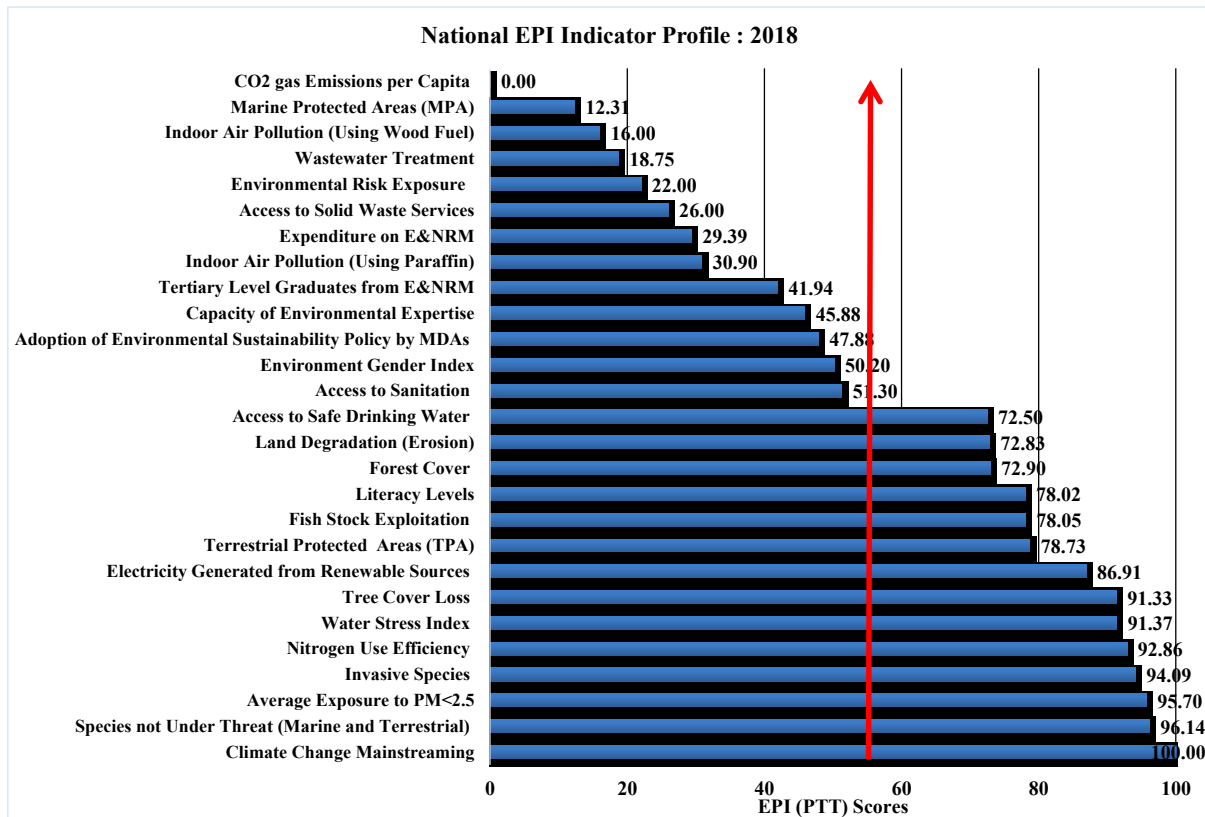
Each Sector Fact Sheet graphic shows:

a.  The County in question, encircled in red to highlight its performance status ranked by sector and
b.  A red line which is the national average, and any County below this line, is effectively under-performing.

## 3. KENYA NATIONAL ENVIRONMENTAL PERFORMANCE INDEX FRAMEWORK: 2018

| Objective Category | Policy | Indicator | Indicator Description | Target | Reference |
|---|---|---|---|---|---|
| **Environmental Health** | Environmental Burden of Disease | Environmental Risk Exposure | % of a population exposed to environmental health risks (a composite of 4 factors of unsafe water, poor sanitation and poor air quality) | 0% | WHO, Vision 2030 |
| | Air Quality | Indoor Air Pollution (Using Wood Fuel) | % of total households using wood fuel as energy for cooking. | 0% | Vision 2030, CoK |
| | | Indoor Air Pollution (Using Paraffin) | % of total households using paraffin for indoor lighting. | 0% | Vision 2030, CoK |
| | | Average Exposure to PM<2.5 | % population exposed to fine particulate matter of PM<2.5µg/m3. | 0% | Vision 2030, CoK |
| | Water and Sanitation | Access to Safe Drinking Water | % of population having access to safe drinking water | 80% | Vision 2030, MWI |
| | | Access to Sanitation | % population that has access to improved sanitation | 100% | MOH |
| | Environmental Nuisance | Access to Solid Waste Services | % of solid waste generated that is collected and disposed of in designated dumpsites | 100% | Vision 2030, EMCA (2015) |
| **Ecosystem Vitality** | Sustainable Water Resources Management | Water Stress Index | % of water demand <40% of total available water resources | <40% | NWMP, 2030 |
| | | Wastewater Treatment | % of urban population covered by formal sewerage services | 100.0% | Vision 2030 |
| | Agriculture, Livestock and Fisheries | Nitrogen Use Efficiency | % N2 output vs N2 input to crops | >70% | SDG 2030 |
| | | Fish Stock Exploitation | % of inland and marine catch vs the peak capacity as the MSY. | <50% | FAO |
| | Forests and woodlands | Tree Cover Loss | % of tree cover vs area in 2000 | 0.0% | Vision 2030 |
| | | Forest Cover | % total land area covered in trees | 10.0% | Vision 2030, CoK |
| | Biodiversity and Habitat | Species not Under Threat (Marine and Terrestrial) | % of all 5 taxa of national species that are not under threat | 0.0% | Vision 2030, IUCN |
| | | Terrestrial Protected Areas (TPA) | % of terrestrial protected area vs total terrestrial land area. | 17.0% | CBD |
| | | Marine Protected Areas (MPA) | % of total MPA vs total marine area | 10.0% | CBD |
| | | Invasive Species | % total land/water area not covered by 4 select indicator invasive plants/animals. | 0.0% | Vision 2030 |
| | Climate Change | Climate Change Mainstreaming | % degree of climate change mainstreaming in National and County budgeting processes | 100.0% | NCCAP |
| | | CO2 gas Emissions per Capita | % of CO2 emissions per capita in comparison to 30% reduction of 2015 emissions | <30% | UN, 2015 |
| | Energy | Electricity Generated from Renewable Sources | % electricity generated from renewable sources | 80.0% | Vision 2030 |
| | Sustainable Land Resource Use | Land Degradation (Erosion) | % total land area that is not at very high risk from soil erosion | 0.0% | SDG 2030 |
| **Socio Economic Sustainability** | Environmental Education | Capacity of Environmental Expertise | % of licensed EIA experts proportionate to 10,000 population | 0.0001% | Expert Opinion |
| | | Literacy Levels | % population over the age of 15 who can both read and write | 100.0% | Vision 2030 |
| | | Tertiary Level Graduates from E&NRM | % students graduated in E&NRM courses from tertiary institutions | 10.0% | Expert Opinion |
| | Gender and Environment | Environment Gender Index | % of women involved in gender responsive environmental conservation | 100.0% | Vision 2030 |
| | Governance, Compliance and Enforcement | Expenditure on E&NRM | % of expenditure on E&NRM Vs total expenditure | 34.0% | Expert Opinion |
| | | Adoption of Environmental Sustainability Policy by MDAs | % degree of adoption of environmentally sustainable policies by MDAs | 100.0% | EMCA |

## 3.1. The National EPI Sector Profile: 2018

In domesticated the EPI to Kenyan conditions, the following performance trends by sector, emerge:

**National EPI Indicator Profile : 2018**

| Indicator | EPI (PTT) Score |
|---|---|
| CO2 gas Emissions per Capita | 0.00 |
| Marine Protected Areas (MPA) | 12.31 |
| Indoor Air Pollution (Using Wood Fuel) | 16.00 |
| Wastewater Treatment | 18.75 |
| Environmental Risk Exposure | 22.00 |
| Access to Solid Waste Services | 26.00 |
| Expenditure on E&NRM | 29.39 |
| Indoor Air Pollution (Using Paraffin) | 30.90 |
| Tertiary Level Graduates from E&NRM | 41.94 |
| Capacity of Environmental Expertise | 45.88 |
| Adoption of Environmental Sustainability Policy by MDAs | 47.88 |
| Environment Gender Index | 50.20 |
| Access to Sanitation | 51.30 |
| Access to Safe Drinking Water | 72.50 |
| Land Degradation (Erosion) | 72.83 |
| Forest Cover | 72.90 |
| Literacy Levels | 78.02 |
| Fish Stock Exploitation | 78.05 |
| Terrestrial Protected Areas (TPA) | 78.73 |
| Electricity Generated from Renewable Sources | 86.91 |
| Tree Cover Loss | 91.33 |
| Water Stress Index | 91.37 |
| Nitrogen Use Efficiency | 92.86 |
| Invasive Species | 94.09 |
| Average Exposure to PM<2.5 | 95.70 |
| Species not Under Threat (Marine and Terrestrial) | 96.14 |
| Climate Change Mainstreaming | 100.00 |

**The National KEPI 2018 based on 27 Indicators**
*(The red line represents the national average showing under-performing sector or Counties)*

The top 5 Kenya national best performing E&NRM sectors are:

a. Climate change mainstreaming has achieved 100% inclusion in all CIDP to date, of varying levels
b. Species under threat are less than 5%, achieving 96% towards a zero threatened status.
c. Exposure to outdoor air quality of PM<2.5 is <5%, achieving 95% to zero risk to human health.
d. The spread of invasive species is just over 5% of area, achieving 94% toward zero coverage.
e. Nitrogen use efficiency in agriculture is at 93% attainment of an international target.

The bottom 5 national poor performing sectors where attention is needed:

a. Kenya has 0% achievement in its maintenance of $CO_2$ emissions at the agreed 2015 levels.
b. Only 1.2% of Marine Protected Areas (MPA) has been achieved towards a target of 10%.
c. >84% of households are exposed to harmful air pollution from indoor cooking fires and 69% from paraffin used for lighting.
d. >81% of towns do not have adequate waste water treatment plants.
e. >78% of population are exposed to environmental health risk from water and air pollution.
f. Less than 26% of population has access to solid waste disposal systems.

## 3.2. How well are the Counties Doing?
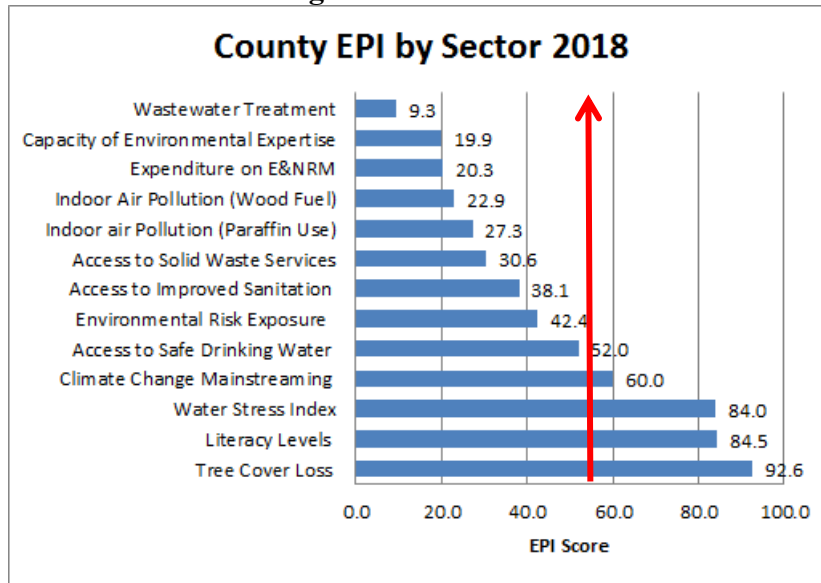


**Consolidated 47 County EPI Scores by Sector**
*(The red line represents the national average showing under-performing sector or Counties)*

Overall, it would appear that the top 5 low performing sectors in Counties vs targets are:

    a.   Waste water treatment is at 9.3%
    b.   Environmental expertise is at 19.9%
    c.   Expenditure on E&NRM is at 20.3%
    d.   Households not exposed to indoor air pollution from fuelwood is 22.9% and paraffin 27.9%
    e.   Access to solid waste disposal is at 30.6 %

## 3.3. How Well is the County Performing: 2018?

The combined EPI score of all sectors ranks the County performance and the following graph allows comparison between Counties showing best performing and those in need of support.

## 3.4. How Well is the County Performance vs The National EPI?

The national EPI is 56.4, and County EPI is 51% suggesting below average performance.

The County is ranked as 33 out of 47 counties, placing it in the below average performing Counties in Kenya, where additional attention is needed to E&NRM in CIDP budgets & annual development plans (ADP).

| | County | EPI |
|---|---|---|
| 1 | Nairobi City | 75.5 |
| 2 | Nyeri | 67.1 |
| 3 | Isiolo | 62.9 |
| 4 | Kiambu | 61.6 |
| 5 | Garissa | 61.5 |
| 6 | Laikipia | 60.9 |
| 7 | Lamu | 60.5 |
| 8 | Uasin Gishu | 59.4 |
| 9 | Trans Nzoia | 59.0 |
| 10 | Busia | 57.8 |
| 11 | Kitui | 57.1 |
| 12 | Nakuru | 57.0 |
| 13 | Nandi | 56.9 |
| 14 | Bungoma | 55.5 |
| 15 | Kisumu | 55.3 |
| 16 | Turkana | 54.8 |
| 17 | Meru | 54.5 |
| 18 | Wajir | 54.2 |
| 19 | West Pokot | 54.1 |
| 20 | Nyandarua | 54.0 |
| 21 | Embu | 53.9 |
| 22 | Baringo | 53.5 |
| 23 | Murang'a | 53.2 |
| 24 | Tharaka-Nith | 53.0 |
| 25 | Kericho | 53.0 |
| 26 | Migori | 52.8 |
| 27 | Mandera | 52.6 |
| 28 | Kirinyaga | 52.6 |
| 29 | Marsabit | 52.2 |
| 30 | Tana River | 52.2 |
| 31 | Samburu | 51.8 |
| 32 | Bomet | 51.6 |
| 33 | Narok | 51.1 |
| 34 | Nyamira | 50.8 |
| 35 | Kakamega | 50.3 |
| 36 | Kajiado | 49.9 |
| 37 | Elgeyo-Mara | 49.7 |
| 38 | Taita-Taveta | 48.9 |
| 39 | Mombasa | 48.3 |
| 40 | Homa Bay | 48.0 |
| 41 | Siaya | 47.7 |
| 42 | Kilifi | 47.2 |
| 43 | Makueni | 47.0 |
| 44 | Kisii | 44.6 |
| 45 | Vihiga | 44.3 |
| 46 | Machakos | 43.9 |
| 47 | Kwale | 42.4 |



**County by County EPI Ranking based on 13 KEPI Indicators**
*(The red line represents the national average showing under-performing sector or Counties)*

### 3.5. County EPI Profile: 2018.

The EPI scores of individual E&NRM sectors performance towards a target, can be ranked for each County according to the available data. In this way the EPI allows County governance and management to make a peer comparison between Counties showing best performing by sector and those that are under-performing and in need of additional support.

In the attached 13 sector EPI Fact Sheet County Profiles and Database, the position of the County vs other Counties can be compared for peer comparison and to emphasize where further priority investment is needed.



**Narok EPI 2017**

| Indicator | Score |
|---|---|
| Wastewater Treatment | 0.00 |
| Capacity of Environmental Expertise | 8.35 |
| Indoor air Pollution (Paraffin Use) | 17.00 |
| Indoor Air Pollution (Wood Fuel) | 17.00 |
| Access to Improved Sanitation | 23.30 |
| Access to Solid Waste Services | 26.00 |
| Environmental Risk Exposure | 36.75 |
| Access to Safe Drinking Water | 41.25 |
| Climate Change Mainstreaming | 60.00 |
| Literacy Levels | 76.40 |
| Tree Cover Loss | 82.81 |
| Expenditure on E&NRM | 85.81 |
| Water Stress Index | 100.00 |

**County EPI Scores based on 13 Indicators**

**How Well is the County Doing by Sector?**

a. Water stress is at 100%, implying adequate long term water endowment.
b. Expenditure on E&NRM is a high 86% of target
c. Literacy levels are at 76%, implying at this average education, >15's should understand E&NRM
d. Tree cover loss is at low 83%, giving a 17% tree cover retention vs the 2000 baseline.

**Where is the County in need of Support?**

The attached 13 indicators, suggest, poor performing sectors in the County where attention is needed includes:

a. Waste water treatment is at 0%, and needs attention.
b. The health of 83% of households are exposed to poor indoor air quality pollution from cooking with fuelwood, and 83% from using paraffin for lighting, needs urgent attention.
c. Capacity in E&NRM expertise is low 8% of target, needs attention
d. Access to improved sanitation is a low77%, needs attention
e. Access to solid waste is at 26%, needs upgrades.

**Recommendations for Environmental Action Plan of the County Government CIDP**

a. County needs to invest in waste water management.
b. Given the high number of households that are dependent on paraffin and fuelwood for cooking and lighting, investment is needed to promote more carbon efficient cook stoves and improved indoor ventilation to avoid respiratory health risks to women and young children exposed to black carbon and particulate matter in the kitchen.
c. County needs to allocate more CIDP budget to E&NRM
d. County needs to invest more on E&NRM capacity development
e. County to increase solid waste management services
f. County needs to upgrade the sanitation system.

## 4. EPI FACT SHEETS DATABASE

**County EPI Fact Sheet 1. Environmental Risk Exposure (ERE)**

Measures % of a population exposed to environmental health risks from: unsafe water, poor sanitation and poor air quality generally due to indoor cooking fires and use of parrafin lamps and burners.

**National ERE of % Population Exposed to Environmental Risks**



% Population Exposed to Environmental Risks
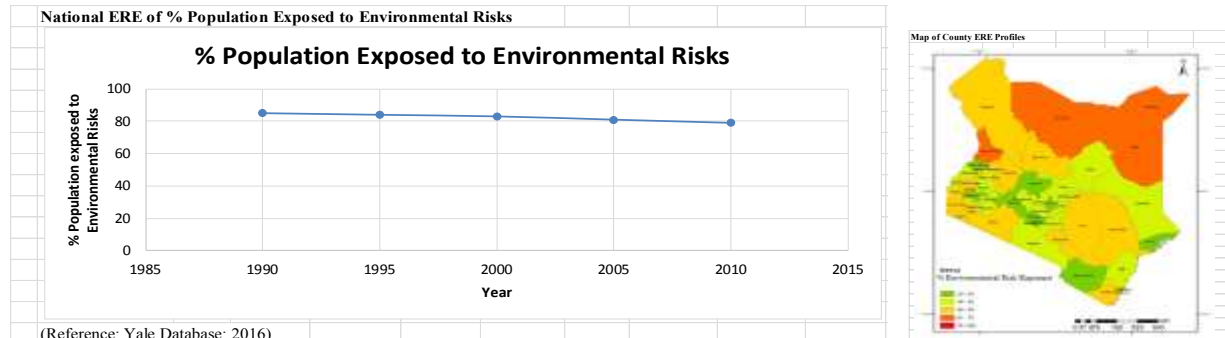
(Reference: Yale Database; 2016)

**Proportion of County Population Exposed to Environmental Health Risks**



% County Population Exposed to ERE

| | County | Unsafe Water (N1) | Unsafe Sanitation (N2) | Indoor Air Pollution (wood fuel use) (N3) | Indoor Air Pollution (Paraffin use) (N4) | County Population at Risk Average % | County EPI Score (Y) % |
|---|---|---|---|---|---|---|---|
| 1 | Nairobi city | 19.00 | 22.00 | 1.8 | 25.7 | 17.13 | 82.88 |
| 2 | Kiambu | 26.00 | 17.00 | 47.3 | 43.3 | 33.40 | 66.60 |
| 3 | Mombasa | 46.00 | 55.00 | 9.0 | 38.8 | 37.20 | 62.80 |
| 4 | Laikipia | 12.00 | 7.00 | 70.0 | 69.0 | 39.50 | 60.50 |
| 5 | Garissa | 38.00 | 19.00 | 79.0 | 50.0 | 46.50 | 53.50 |
| 6 | Isiolo | 42.00 | 24.00 | 70.0 | 50.4 | 46.60 | 53.40 |
| 7 | Lamu | 27.00 | 20.00 | 70.0 | 72.3 | 47.33 | 52.68 |
| 8 | Nyeri | 28.00 | 22.00 | 72.0 | 67.5 | 47.38 | 52.63 |
| 9 | Nakuru | 21.00 | 26.00 | 85.6 | 61.5 | 48.53 | 51.48 |
| 10 | Kisumu | 32.00 | 24.00 | 60.0 | 79.4 | 48.85 | 51.15 |
| 11 | Taita-Taveta | 24.00 | 23.00 | 75.0 | 80.7 | 50.68 | 49.33 |
| 12 | Nyamira | 63.00 | 16.00 | 50.0 | 80.5 | 52.38 | 47.63 |
| 13 | Uasin Gishu | 28.00 | 36.00 | 84.0 | 68.1 | 54.03 | 45.98 |
| 14 | Tharaka-Nithi | 24.00 | 27.00 | 90.0 | 79.6 | 55.15 | 44.85 |
| 15 | Kajiado | 65.00 | 35.00 | 67.2 | 54.6 | 55.45 | 44.55 |
| 16 | Meru | 38.00 | 23.00 | 86.0 | 77.2 | 56.05 | 43.95 |
| 17 | Kirinyaga | 66.00 | 12.00 | 68.5 | 78.3 | 56.19 | 43.81 |
| 18 | Baringo | 55.00 | 31.00 | 86.4 | 59.4 | 57.95 | 42.05 |
| 19 | Kericho | 42.00 | 26.00 | 80.0 | 86.2 | 58.55 | 41.45 |
| 20 | Bomet | 25.00 | 30.00 | 91.0 | 91.0 | 59.25 | 40.75 |
| 21 | Nandi | 49.00 | 9.00 | 88.0 | 91.3 | 59.33 | 40.68 |
| 22 | Trans Nzoia | 17.00 | 65.00 | 70.0 | 88.1 | 60.03 | 39.98 |
| 23 | Murang'a | 52.00 | 26.00 | 80.0 | 82.4 | 60.10 | 39.90 |
| 24 | Busia | 27.00 | 24.00 | 98.0 | 92.8 | 60.45 | 39.55 |
| 25 | Samburu | 75.00 | 67.00 | 70.0 | 30.0 | 60.50 | 39.50 |
| 26 | Mandera | 50.00 | 50.00 | 96.0 | 46.3 | 60.58 | 39.43 |
| 27 | Nyandarua | 57.00 | 25.00 | 79.0 | 81.6 | 60.65 | 39.35 |
| 28 | West Pokot | 80.00 | 24.00 | 90.0 | 48.8 | 60.70 | 39.30 |
| 29 | Bungoma | 18.00 | 40.00 | 93.0 | 93.3 | 61.08 | 38.93 |
| 30 | Wajir | 50.00 | 50.00 | 97.0 | 48.2 | 61.30 | 38.70 |
| 31 | Machakos | 45.00 | 40.00 | 82.0 | 78.5 | 61.38 | 38.63 |
| 32 | Marsabit | 78.00 | 40.00 | 93.0 | 35.8 | 61.70 | 38.30 |
| 33 | Narok | 67.00 | 20.00 | 83.0 | 83.0 | 63.25 | 36.75 |
| 34 | Kakamega | 50.00 | 24.00 | 88.0 | 92.1 | 63.53 | 36.48 |
| 35 | Kisii | 63.00 | 16.00 | 85.7 | 89.7 | 63.60 | 36.40 |
| 36 | Kilifi | 39.00 | 57.00 | 80.0 | 79.7 | 63.93 | 36.08 |
| 37 | Makueni | 69.00 | 15.00 | 85.0 | 88.0 | 64.25 | 35.75 |
| 38 | Kwale | 53.00 | 38.00 | 80.0 | 86.2 | 64.30 | 35.70 |
| 39 | Elgeyo-Marakwet | 79.00 | 14.00 | 91.0 | 75.3 | 64.83 | 35.18 |
| 40 | Embu | 32.00 | 75.00 | 80.0 | 79.6 | 66.65 | 33.35 |
| 41 | Kitui | 71.00 | 23.00 | 88.4 | 85.5 | 66.98 | 33.03 |
| 42 | Tana River | 50.00 | 50.00 | 88.0 | 86.7 | 68.68 | 31.33 |
| 43 | Homa Bay | 80.00 | 44.00 | 58.0 | 94.2 | 69.05 | 30.95 |
| 44 | Turkana | 51.00 | 64.00 | 95.0 | 70.0 | 70.00 | 30.00 |
| 45 | Siaya | 66.00 | 38.00 | 83.0 | 93.9 | 70.23 | 29.78 |
| 46 | Migori | 82.00 | 35.00 | 77.0 | 92.0 | 71.50 | 28.50 |
| 47 | Vihiga | 84.00 | 61.00 | 85.0 | 90.6 | 80.15 | 19.85 |

(Reference: KNBS Statistical Abstract 2016, SID, 2013 and County CIDPs)

**SOER Drivers, Pressures, Status, Impact and Response (DPSIR)**

**Driver:** Poverty and poor services exposes people to environmental health risks.

**Pressures:** Population growth and indiscriminant waste dumping contaminates air and water.

**State**: National ERE is 78% population at risk & County at 63% is top 15 ranked threat risk

**Impact:** Impacts health, affects human well-being, leading to morbidity and mortality.

**Response:**    Promotion of cleaner cooking and lighting technologies and increased investments in water supply, sanitation and sewerage treatment infrastructure.

## County EPI Fact Sheet 2. Indoor Air Pollution from wood fuel use

Measures % of total households using wood fuel for indoor cooking versus a target of 0% so to reduce human health risk from exposure to poor air quality from black carbon and particulate matter (PM).

**% National HH Exposed to Poor Indoor Air Quality**
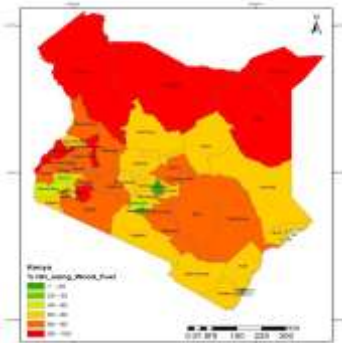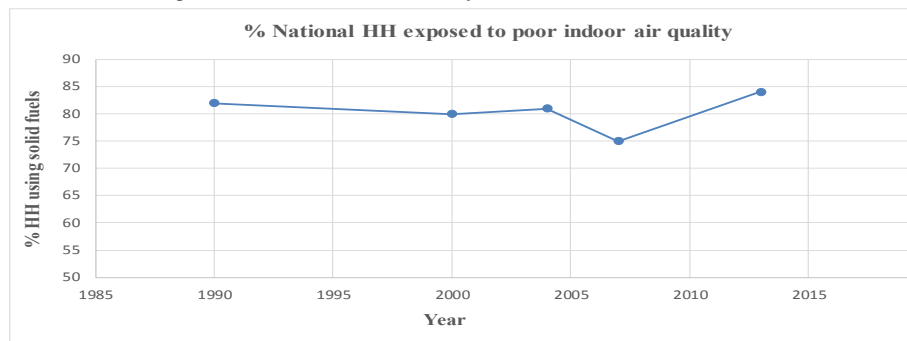


Reference: (Yale Database, 2016)

**% HH at County Level Using Wood Fuel**

| | County | Total National No of HH | No of HH Using Wood Fuel | % HH Using Wood Fuel | EPI Score (PTT) |
|---|---|---|---|---|---|
| 1 | Busia | 154,225 | 151,141 | 98.00 | 2.00 |
| 2 | Wajir | 88,574 | 85,917 | 97.00 | 3.00 |
| 3 | Mandera | 125,497 | 120,477 | 96.00 | 4.00 |
| 4 | Turkana | 123,191 | 117,031 | 95.00 | 5.00 |
| 5 | Marsabit | 56,941 | 52,955 | 93.00 | 7.00 |
| 6 | Bungoma | 270,824 | 251,866 | 93.00 | 7.00 |
| 7 | Elgeyo-Marakwet | 77,555 | 70,575 | 91.00 | 9.00 |
| 8 | Bomet | 142,361 | 129,549 | 91.00 | 9.00 |
| 9 | Tharaka-Nithi | 27,393 | 24,654 | 90.00 | 10.00 |
| 10 | West Pokot | 93,777 | 84,399 | 90.00 | 10.00 |
| 11 | Kitui | 205,491 | 181,654 | 88.40 | 11.60 |
| 12 | Tana River | 47,414 | 41,724 | 88.00 | 12.00 |
| 13 | Kakamega | 355,679 | 312,998 | 88.00 | 12.00 |
| 14 | Nandi | 154,073 | 135,584 | 88.00 | 12.00 |
| 15 | Baringo | 110,649 | 95,601 | 86.40 | 13.60 |
| 16 | Meru | 381,026 | 327,682 | 86.00 | 14.00 |
| 17 | Kisii | 269,683 | 231,118 | 85.70 | 14.30 |
| 18 | Nakuru | 409,836 | 350,820 | 85.60 | 14.40 |
| 19 | Vihiga | 123,347 | 104,845 | 85.00 | 15.00 |
| 20 | Makueni | 186,478 | 158,506 | 85.00 | 15.00 |
| 21 | Uasin Gishu | 202,291 | 169,924 | 84.00 | 16.00 |
| 22 | Narok | 169,220 | 140,453 | 83.00 | 17.00 |
| 23 | Siaya | 199,034 | 165,198 | 83.00 | 17.00 |
| 24 | Machakos | 264,500 | 216,890 | 82.00 | 18.00 |
| 25 | Kwale | 122,047 | 97,638 | 80.00 | 20.00 |
| 26 | Embu | 131,683 | 105,346 | 80.00 | 20.00 |
| 27 | Kilifi | 199,764 | 159,811 | 80.00 | 20.00 |
| 28 | Murang'a | 242,490 | 193,992 | 80.00 | 20.00 |
| 29 | Kericho | 160,134 | 128,107 | 80.00 | 20.00 |
| 30 | Garissa | 98,590 | 77,886 | 79.00 | 21.00 |
| 31 | Nyandarua | 143879 | 113664 | 79.00 | 21.00 |
| 32 | Migori | 180211 | 138762 | 77.00 | 23.00 |
| 33 | Taita-Taveta | 71090 | 53318 | 75.00 | 25.00 |
| 34 | Nyeri | 201703 | 145226 | 72.00 | 28.00 |
| 35 | Lamu | 22184 | 15529 | 70.00 | 30.00 |
| 36 | Isiolo | 31326 | 21928 | 70.00 | 30.00 |
| 37 | Samburu | 47354 | 33148 | 70.00 | 30.00 |
| 38 | Trans Nzoia | 170117 | 119082 | 70.00 | 30.00 |
| 39 | Laikipia | 103114 | 72180 | 70.00 | 30.00 |
| 40 | Kirinyaga | 154,220 | 105,576 | 68.46 | 31.54 |
| 41 | Kajiado | 173464 | 116568 | 67.20 | 32.80 |
| 42 | Kisumu | 226719 | 136031 | 60.00 | 40.00 |
| 43 | Homa Bay | 206255 | 119628 | 58.00 | 42.00 |
| 44 | Nyamira | 106385 | 53193 | 50.00 | 50.00 |
| 45 | Kiambu | 482450 | 228199 | 47.30 | 52.70 |
| 46 | Mombasa | 268,700 | 24,183 | 9.00 | 91.00 |
| 47 | Nairobi city | 985,016 | 17,730 | 1.80 | 98.20 |

(Reference KNBS, 2016, Statistical Abstracts 2016, CIDPs 2013-17)



**% HH Using Wood Fuel**

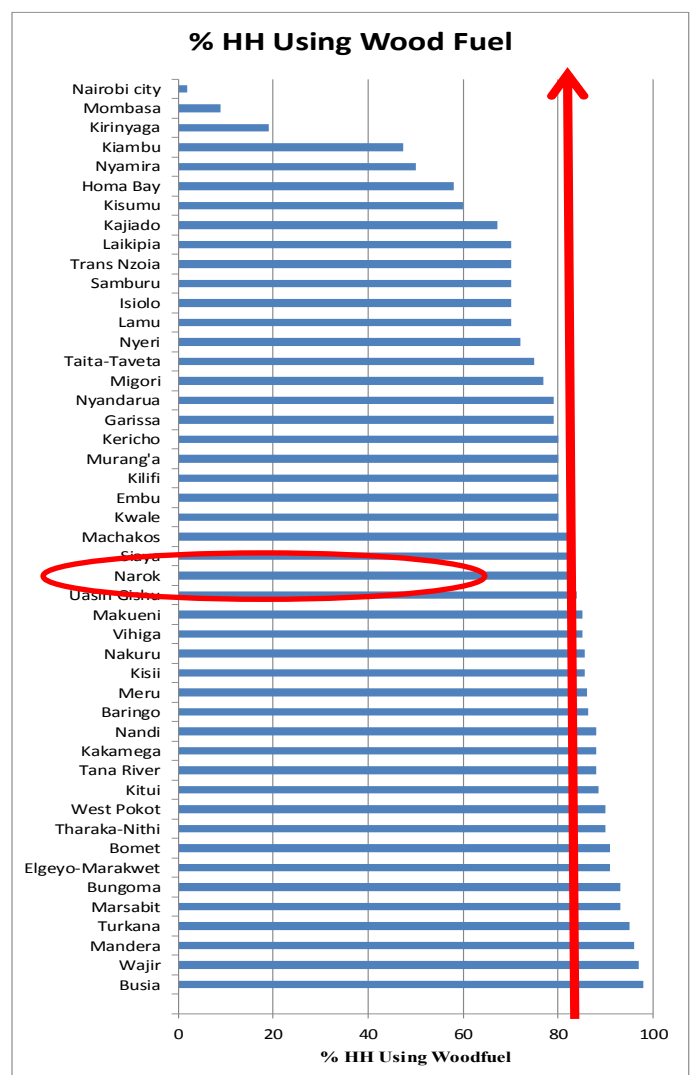### SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Driver:** Poverty drives a need for cheaper energy, such as fuel wood for cooking.

**Pressure:** Air pollutants of black carbon and particulate matter affect human respiratory health.

**State:** Ranked 22nd highest with 83% population exposed to health risk from indoor fires.

**Impact:** Health and reduced well-being, lead to morbidity and mortality, especially women.

**Response:** County to promoting cleaner technology for cooking, construction of well-ventilated kitchens and raise awareness on the implications of using wood fuel on human health.

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## County EPI Fact Sheet 3. Indoor Air Pollution using Paraffin as Fuel

Measures % of total households using paraffin for indoor cooking and lighting, and exposed to respiratory health risks resulting from poor air quality due to black carbon and particulate matter.

**% National HH exposed to poor indoor air quality from Paraffin**

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| % HH Using Paraffin | | | | 69.1 | | |
| EPI Score (PTT) | 100 | 100 | 100 | 30.9 | 100 | 100 |

(Reference KNBS and SID 2013, CIDPs 2013-17)

**% National HH exposed to poor indoor air quality from Paraffin**
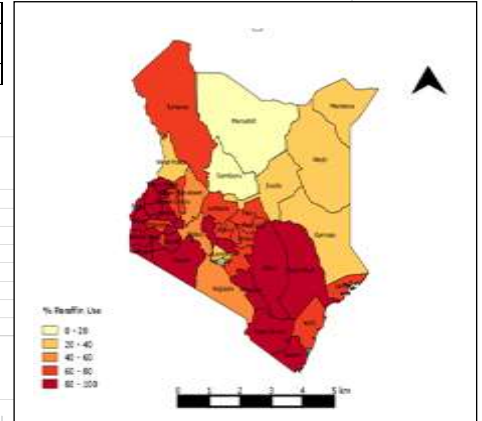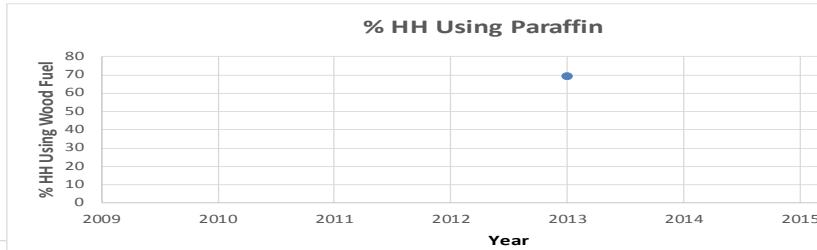




**% HH using Paraffin by County**

| | County | % HH Using Paraffin | EPI Score (PTT) |
|---|---|---|---|
| 1 | Nairobi city | 25.7 | 74.30 |
| 2 | Samburu | 30.0 | 70.00 |
| 3 | Marsabit | 35.8 | 64.20 |
| 4 | Mombasa | 38.8 | 61.20 |
| 5 | Kiambu | 43.3 | 56.70 |
| 6 | Mandera | 46.3 | 53.70 |
| 7 | Wajir | 48.2 | 51.80 |
| 8 | West Pokot | 48.8 | 51.20 |
| 9 | Garissa | 50.0 | 50.00 |
| 10 | Isiolo | 50.4 | 49.60 |
| 11 | Kajiado | 54.6 | 45.40 |
| 12 | Baringo | 59.4 | 40.60 |
| 13 | Nakuru | 61.5 | 38.50 |
| 14 | Nyeri | 67.5 | 32.50 |
| 15 | Uasin Gishu | 68.1 | 31.90 |
| 16 | Laikipia | 69.0 | 31.00 |
| 17 | Turkana | 70.0 | 30.00 |
| 18 | Lamu | 72.3 | 27.70 |
| 19 | Elgeyo-Marakwet | 75.3 | 24.70 |
| 20 | Meru | 77.2 | 22.80 |
| 21 | Kirinyaga | 78.3 | 21.70 |
| 22 | Machakos | 78.5 | 21.50 |
| 23 | Kisumu | 79.4 | 20.60 |
| 24 | Embu | 79.6 | 20.40 |
| 25 | Tharaka-Nithi | 79.6 | 20.40 |
| 26 | Kilifi | 79.7 | 20.30 |
| 27 | Nyamira | 80.5 | 19.50 |
| 28 | Taita-Taveta | 80.7 | 19.30 |
| 29 | Nyandarua | 81.6 | 18.40 |
| 30 | Murang'a | 82.4 | 17.60 |
| 31 | Narok | 83.0 | 17.00 |
| 32 | Kitui | 85.5 | 14.50 |
| 33 | Kericho | 86.2 | 13.80 |
| 34 | Kwale | 86.2 | 13.80 |
| 35 | Tana River | 86.7 | 13.30 |
| 36 | Makueni | 88.0 | 12.00 |
| 37 | Trans Nzoia | 88.1 | 11.90 |
| 38 | Kisii | 89.7 | 10.30 |
| 39 | Vihiga | 90.6 | 9.40 |
| 40 | Bomet | 91.0 | 9.00 |
| 41 | Nandi | 91.3 | 8.70 |
| 42 | Migori | 92.0 | 8.00 |
| 43 | Kakamega | 92.1 | 7.90 |
| 44 | Busia | 92.8 | 7.20 |
| 45 | Bungoma | 93.3 | 6.70 |
| 46 | Siaya | 93.9 | 6.10 |
| 47 | Homa Bay | 94.2 | 5.80 |

(Reference KNBS and SID 2013, CIDPs 2013-17)
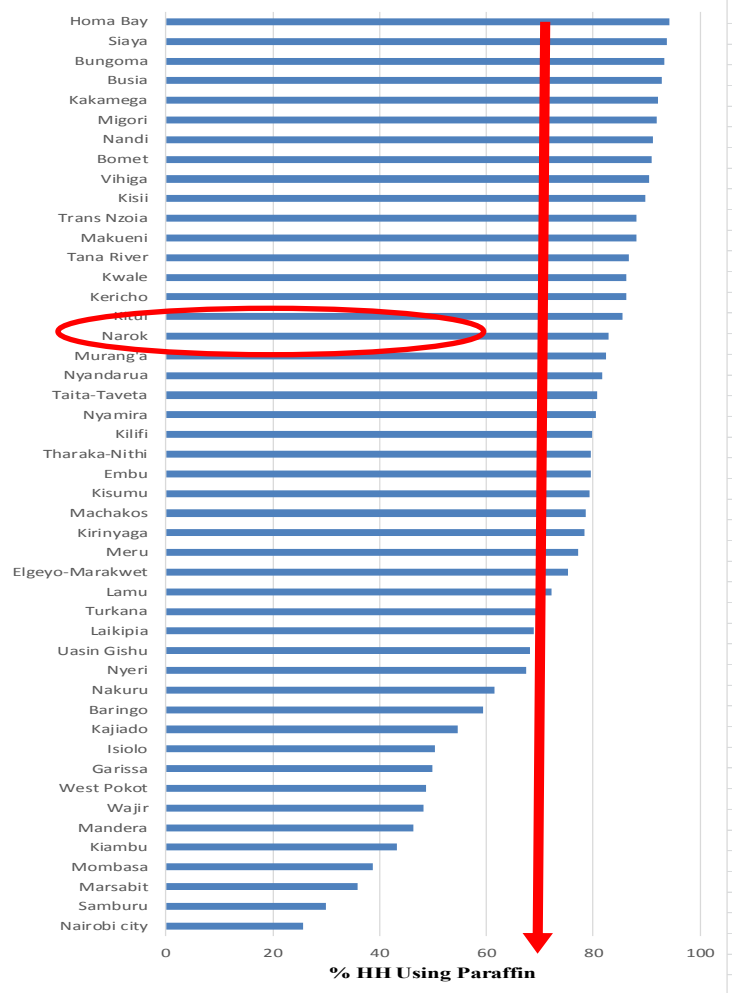


## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Driver:** Poverty drives HH to cheaper energy, such as paraffin for cooking and lighting

**Pressure:** Air pollutants affect human respiratory health from black carbon from paraffin

**State** Ranked 33 with 83% population exposed to health risk from paraffin burning

**Impact:** Affects respiratory health and well-being, leading to morbidity, and mortality.

**Response:** Promote cleaner technology for paraffin use, construction of well-ventilated houses and raise awareness on the implications of using paraffin on health.

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## County EPI Fact Sheet 4. Access to Safe Drinking Water

Measures % of population having access to safe drinking water and therefore not at health risk from water borne diseases.

**National % Population Accessing Safe Drinking Water**



**Trends in % Population Accessing Safe Drinking Water**
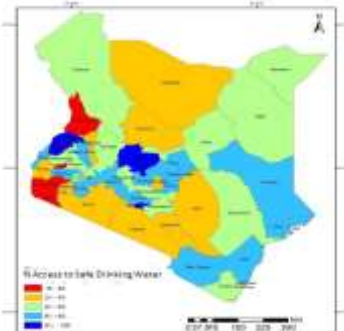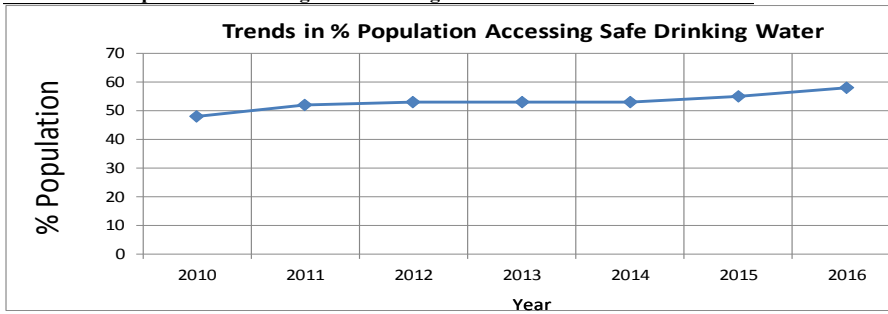
(Reference: Ministry of Water and Irrigation, 2016)

**County % Population Accessing Safe Drinking Water**



% Population Accessing...

| | County | % Population Accessing safe drinking water | EPI Score (T=100) | EPI Score (T=80) | EPI Score (T=80) |
|---|---|---|---|---|---|
| 1 | Laikipia | 88.0 | 88.0 | 110.0 | 100.0 |
| 2 | Trans Nzoia | 83.0 | 83.0 | 103.8 | 100.0 |
| 3 | Bungoma | 82.0 | 82.0 | 102.5 | 100.0 |
| 4 | Nairobi city | 81.0 | 81.0 | 101.3 | 100.0 |
| 5 | Nakuru | 79.0 | 79.0 | 98.8 | 98.8 |
| 6 | Taita-Taveta | 76.0 | 76.0 | 95.0 | 95.0 |
| 7 | Tharaka-Nithi | 76.0 | 76.0 | 95.0 | 95.0 |
| 8 | Bomet | 75.0 | 75.0 | 93.8 | 93.8 |
| 9 | Kiambu | 74.0 | 74.0 | 92.5 | 92.5 |
| 10 | Lamu | 73.0 | 73.0 | 91.3 | 91.3 |
| 11 | Busia | 73.0 | 73.0 | 91.3 | 91.3 |
| 12 | Nyeri | 72.0 | 72.0 | 90.0 | 90.0 |
| 13 | Uasin Gishu | 72.0 | 72.0 | 90.0 | 90.0 |
| 14 | Embu | 68.0 | 68.0 | 85.0 | 85.0 |
| 15 | Kisumu | 68.0 | 68.0 | 85.0 | 85.0 |
| 16 | Garissa | 62.0 | 62.0 | 77.5 | 77.5 |
| 17 | Meru | 62.0 | 62.0 | 77.5 | 77.5 |
| 18 | Kilifi | 61.0 | 61.0 | 76.3 | 76.3 |
| 19 | Isiolo | 58.0 | 58.0 | 72.5 | 72.5 |
| 20 | Kericho | 58.0 | 58.0 | 72.5 | 72.5 |
| 21 | Machakos | 55.0 | 55.0 | 68.8 | 68.8 |
| 22 | Mombasa | 54.0 | 54.0 | 67.5 | 67.5 |
| 23 | Nandi | 51.0 | 51.0 | 63.8 | 63.8 |
| 24 | Tana River | 50.0 | 50.0 | 62.5 | 62.5 |
| 25 | Wajir | 50.0 | 50.0 | 62.5 | 62.5 |
| 26 | Mandera | 50.0 | 50.0 | 62.5 | 62.5 |
| 27 | Kakamega | 50.0 | 50.0 | 62.5 | 62.5 |
| 28 | Turkana | 49.0 | 49.0 | 61.3 | 61.3 |
| 29 | Murang'a | 48.0 | 48.0 | 60.0 | 60.0 |
| 30 | Kwale | 47.0 | 47.0 | 58.8 | 58.8 |
| 31 | Baringo | 45.0 | 45.0 | 56.3 | 56.3 |
| 32 | Nyandarua | 43.0 | 43.0 | 53.8 | 53.8 |
| 33 | Kisii | 37.0 | 37.0 | 46.3 | 46.3 |
| 34 | Nyamira | 37.0 | 37.0 | 46.3 | 46.3 |
| 35 | Kajiado | 35.0 | 35.0 | 43.8 | 43.8 |
| 36 | Kirinyaga | 34.0 | 34.0 | 42.5 | 42.5 |
| 37 | Siaya | 34.0 | 34.0 | 42.5 | 42.5 |
| 38 | Narok | 33.0 | 33.0 | 41.3 | 41.3 |
| 39 | Makueni | 31.0 | 31.0 | 38.8 | 38.8 |
| 40 | Kitui | 29.0 | 29.0 | 36.3 | 36.3 |
| 41 | Samburu | 25.0 | 25.0 | 31.3 | 31.3 |
| 42 | Marsabit | 22.0 | 22.0 | 27.5 | 27.5 |
| 43 | Elgeyo-Marakwet | 21.0 | 21.0 | 26.3 | 26.3 |
| 44 | West Pokot | 20.0 | 20.0 | 25.0 | 25.0 |
| 45 | Homa Bay | 20.0 | 20.0 | 25.0 | 25.0 |
| 46 | Migori | 18.0 | 18.0 | 22.5 | 22.5 |
| 47 | Vihiga | 16.0 | 16.0 | 20.0 | 20.0 |
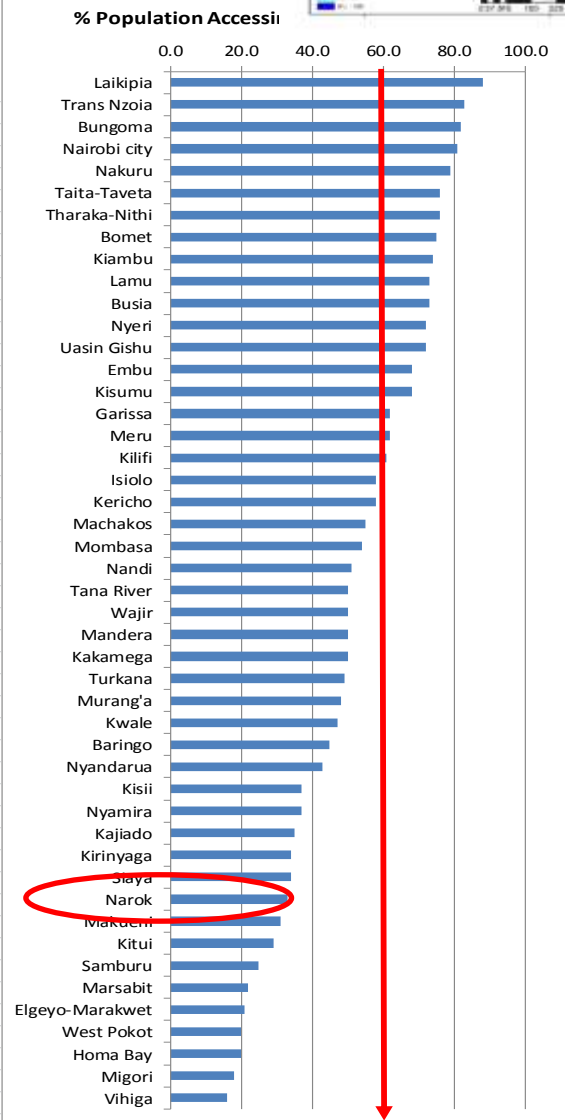
(Reference: Ministry of Water and Irrigation, 2016)

## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** Population growth is exceeding the investment in safe water supply.

**Pressure:** Increased microbial pathogens, leads to waterborne disease from contaminated water.

**State:** Ranks top 10 lowest with 33% of population having access to safe drinking water.

**Impact:** Increased cases of morbidity and mortality from waterborne diseases.

**Response:** County to increase resources to invest in improved water supply infrastructure.

## County EPI Fact Sheet 5. Access to Improved Sanitation

Measures % population with access to improved sanitation services for safe disposal of human waste.

**% National Population Accessing Improved Sanitation**

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % Pop w sanitation | 51.5 | 51.4 | 51.4 | 51.4 | 51.3 | 51.3 | 51.3 | 51.2 | 51.2 | 51.2 | 51.2 | 51.2 | 51.2 | 51.2 | 51.2 | 51.3 | | |

(Reference: JMP 2017)

**% National Population Accessing Improved Sanitation**



% National Population Accessing Improved Sanitation
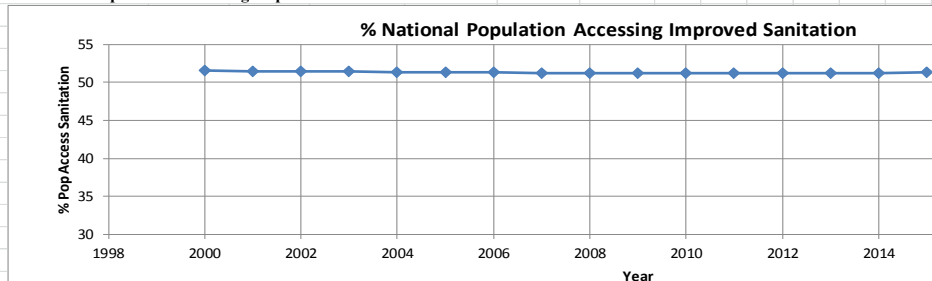
(Reference: MWI 2016)

**% County Population Accessing Improved Sanitation**

| | County | % Urban Pop Accessing Sanitation | % Rural Pop Accessing Sanitation | Urban Pop | Rural Pop | % Pop Accessing Improved Sanitation |
|---|---|---|---|---|---|---|
| 1 | Turkana | 36.0 | 7.0 | 102,886 | 942,693 | 9.85 |
| 2 | Wajir | 50.0 | 4.0 | 91,300 | 359,085 | 13.32 |
| 3 | Samburu | 33.0 | 12.0 | 36,353 | 237,451 | 14.79 |
| 4 | West Pokot | 76.0 | 15.0 | 34,046 | 592,786 | 18.31 |
| 5 | Mandera | 50.0 | 9.0 | 159,901 | 538,021 | 18.39 |
| 6 | Kwale | 62.0 | 15.0 | 112,908 | 679,790 | 21.69 |
| 7 | Narok | 80.0 | 20.0 | 57,114 | 982,723 | 23.30 |
| 8 | Marsabit | 60.0 | 14.0 | 64,249 | 248,449 | 23.45 |
| 9 | Homa Bay | 56.0 | 22.0 | 133,488 | 968,413 | 26.12 |
| 10 | Baringo | 69.0 | 22.0 | 60,995 | 618,261 | 26.22 |
| 11 | Kilifi | 43.0 | 26.0 | 275,162 | 1,077,880 | 29.46 |
| 12 | Siaya | 62.0 | 26.0 | 99,504 | 863,503 | 29.72 |
| 13 | Elgeyo-Marakwet | 86.0 | 26.0 | 49,972 | 402,388 | 32.63 |
| 14 | Makueni | 85.0 | 31.0 | 38,028 | 911,270 | 33.16 |
| 15 | Embu | 25.0 | 36.0 | 82,915 | 471,164 | 34.35 |
| 16 | Migori | 65.0 | 28.0 | 180,493 | 868,109 | 34.37 |
| 17 | Kitui | 77.0 | 29.0 | 125,538 | 961,061 | 34.55 |
| 18 | Mombasa | 45.0 | 0.0 | 938,131 | 207,128 | 36.86 |
| 19 | Garissa | 81.0 | 17.0 | 136,052 | 287,879 | 37.54 |
| 20 | Busia | 76.0 | 33.0 | 88,464 | 737,372 | 37.61 |
| 21 | Lamu | 80.0 | 31.0 | 18,382 | 105,460 | 38.27 |
| 22 | Tana River | 50.0 | 37.0 | 36,065 | 256,820 | 38.60 |
| 23 | Nyamira | 84.0 | 36.0 | 47,305 | 636,674 | 39.32 |
| 24 | Kericho | 74.0 | 36.0 | 92,095 | 800,334 | 39.92 |
| 25 | Tharaka-Nithi | 73.0 | 33.0 | 71,885 | 320,210 | 40.33 |
| 26 | Murang'a | 74.0 | 37.0 | 107,551 | 956,170 | 40.74 |
| 27 | Bungoma | 60.0 | 39.0 | 229,271 | 1,297,469 | 42.15 |
| 28 | Kisii | 84.0 | 35.0 | 195,644 | 1,121,763 | 42.28 |
| 29 | Bomet | 70.0 | 36.0 | 205,060 | 714,577 | 43.58 |
| 30 | Kajiado | 65.0 | 33.0 | 279,689 | 560,438 | 43.65 |
| 31 | Isiolo | 76.0 | 23.0 | 61,162 | 92,713 | 44.07 |
| 32 | Vihiga | 39.0 | 46.0 | 168,042 | 447,692 | 44.09 |
| 33 | Meru | 77.0 | 42.0 | 94,753 | 1,361,096 | 44.28 |
| 34 | Nyandarua | 75.0 | 40.0 | 83,948 | 589,052 | 44.37 |
| 35 | Nandi | 91.0 | 39.0 | 96,923 | 823,522 | 44.48 |
| 36 | Machakos | 60.0 | 34.0 | 562,425 | 616,790 | 46.40 |
| 37 | Trans Nzoia | 35.0 | 48.0 | 117,846 | 883,159 | 46.47 |
| 38 | Nyeri | 78.0 | 40.0 | 139,621 | 643,243 | 46.78 |
| 39 | Kakamega | 76.0 | 45.0 | 219,185 | 1,624,135 | 48.69 |
| 40 | Taita-Taveta | 77.0 | 37.0 | 104,994 | 242,201 | 49.10 |
| 41 | Uasin Gishu | 64.0 | 43.0 | 325,195 | 767,608 | 49.25 |
| 42 | Laikipia | 93.0 | 39.0 | 92,836 | 395,098 | 49.27 |
| 43 | Kirinyaga | 88.0 | 45.0 | 60,762 | 535,268 | 49.38 |
| 44 | Nakuru | 74.0 | 42.0 | 617,651 | 1,342,229 | 52.08 |
| 45 | Kisumu | 76.0 | 30.0 | 579,858 | 527,897 | 54.08 |
| 46 | Kiambu | 83.0 | 30.0 | 936,411 | 895,389 | 57.09 |
| 47 | Nairobi city | 78.0 | 0.0 | 4,232,087 | - | 78.00 |
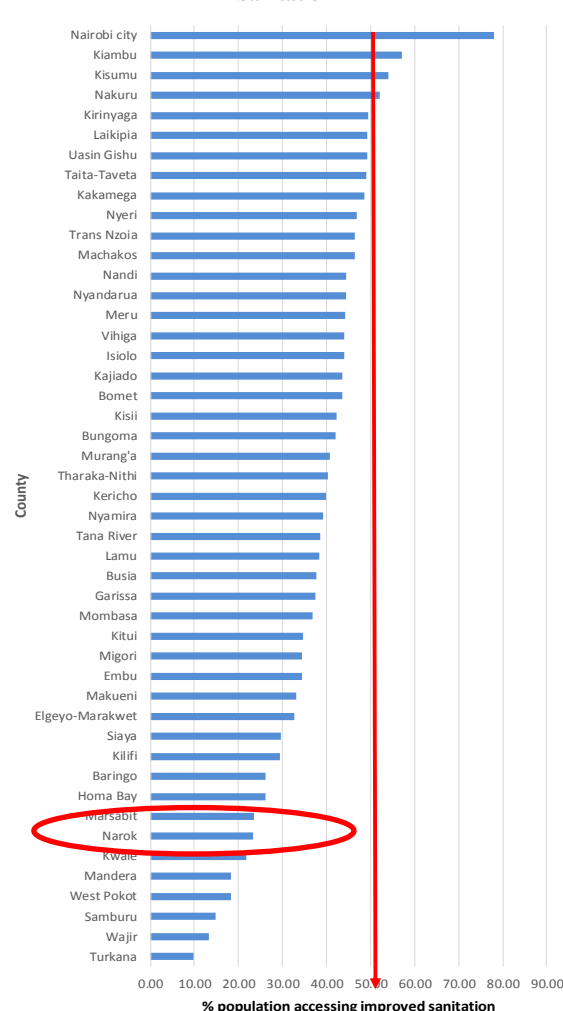
(Reference: Annual Water Sector Review Report, 2016)



**% County Population Accessing Improved Sanitation**

## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** Population growth exceeding investment in improved sanitation services.

**Pressures:** Increase in microbial pathogens and related diseases due to contaminated water.

**State:** County ranks worst 7, with 23% of population accessing improved sanitation.

**Impact:** Increased cases of waterborne diseases, leads to morbidity and mortality.

**Response:** County to increase resource allocation to expand improved sanitation infrastructure.

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## County EPI Fact Sheet 6. Access to Solid Waste Services

Measures % of total solid wastes generated that is collected and disposed of in designated dumpsites.

**% Solid Wastes Safely Disposed off vs Total Generated**



**% solid waste safely disposed in dump sites**
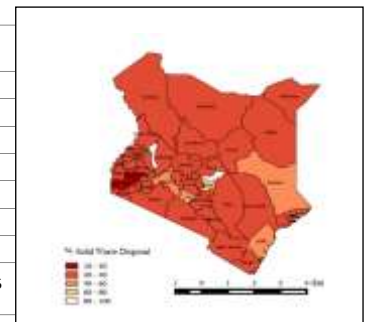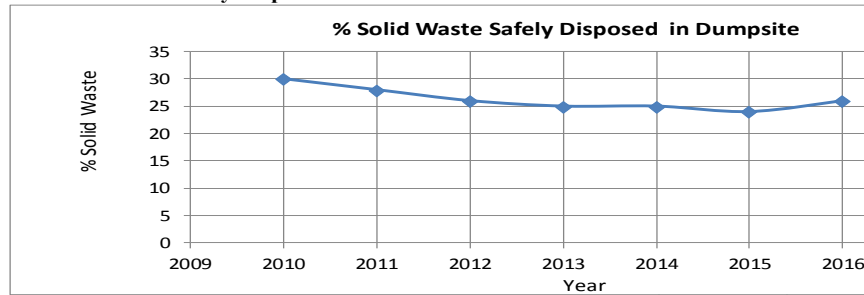


**% County Solid Waste Disposed in Dumpsites**

| | County | % solid waste safely disposed in dumpsites. | EPI Score |
|---|---|---|---|
| 1 | Homa Bay | 17.0 | 17.0 |
| 2 | Kisumu | 20.0 | 20.0 |
| 3 | West Pokot | 26.0 | 26.0 |
| 4 | Wajir | 26.0 | 26.0 |
| 5 | Vihiga | 26.0 | 26.0 |
| 6 | Uasin Gishu | 26.0 | 26.0 |
| 7 | Turkana | 26.0 | 26.0 |
| 8 | Trans Nzoia | 26.0 | 26.0 |
| 9 | Tharaka-Nithi | 26.0 | 26.0 |
| 10 | Tana River | 26.0 | 26.0 |
| 11 | Taita-Taveta | 26.0 | 26.0 |
| 12 | Siaya | 26.0 | 26.0 |
| 13 | Samburu | 26.0 | 26.0 |
| 14 | Nyeri | 26.0 | 26.0 |
| 15 | Nyandarua | 26.0 | 26.0 |
| 16 | Nyamira | 26.0 | 26.0 |
| 17 | Narok | 26.0 | 26.0 |
| 18 | Nandi | 26.0 | 26.0 |
| 19 | Murang'a | 26.0 | 26.0 |
| 20 | Migori | 26.0 | 26.0 |
| 21 | Meru | 26.0 | 26.0 |
| 22 | Marsabit | 26.0 | 26.0 |
| 23 | Mandera | 26.0 | 26.0 |
| 24 | Makueni | 26.0 | 26.0 |
| 25 | Machakos | 26.0 | 26.0 |
| 26 | Lamu | 26.0 | 26.0 |
| 27 | Laikipia | 26.0 | 26.0 |
| 28 | Kwale | 26.0 | 26.0 |
| 29 | Kitui | 26.0 | 26.0 |
| 30 | Kisii | 26.0 | 26.0 |
| 31 | Kirinyaga | 26.0 | 26.0 |
| 32 | Kericho | 26.0 | 26.0 |
| 33 | Kakamega | 26.0 | 26.0 |
| 34 | Kajiado | 26.0 | 26.0 |
| 35 | Isiolo | 26.0 | 26.0 |
| 36 | Elgeyo-Marakwet | 26.0 | 26.0 |
| 37 | Busia | 26.0 | 26.0 |
| 38 | Bungoma | 26.0 | 26.0 |
| 39 | Bomet | 26.0 | 26.0 |
| 40 | Baringo | 26.0 | 26.0 |
| 41 | Nakuru | 45.0 | 45.0 |
| 42 | Garissa | 45.0 | 45.0 |
| 43 | Kiambu | 55.0 | 55.0 |
| 44 | Kilifi | 60.0 | 60.0 |
| 45 | Mombasa | 65.0 | 65.0 |
| 46 | Embu | 65.0 | 65.0 |
| 47 | Nairobi city | 80.0 | 80.0 |
| | NB: Missing data = National Average | | 26 |

(Reference: NEMA (2015)
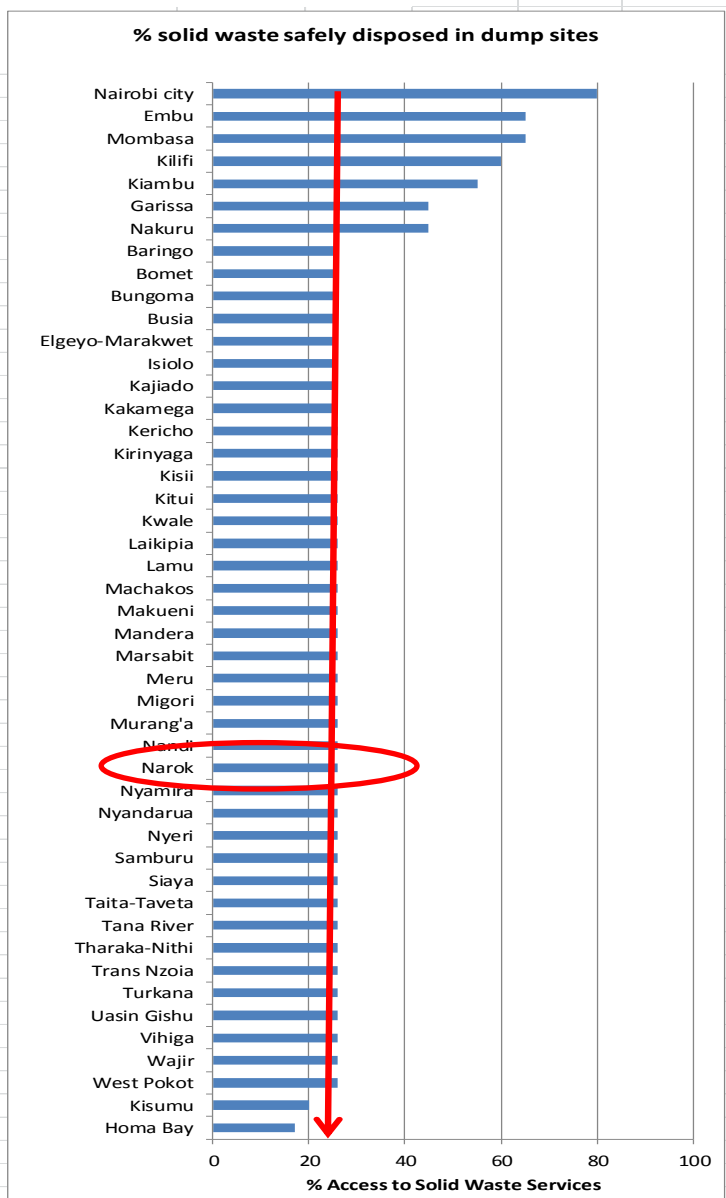
## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** Urbanization & population growth exceed capacity in solid waste management.

**Pressures:** Increase in pathogen and toxin related diseases due to contaminated air and water.

**State:** County is averaging the national trend, at 26% collected, shows low performance.

**Impact:** Proliferation of disease and water degradation from leachates and GHG emissions.

**Response:** Increase resource allocation, expand improved waste management infrastructure.

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## County EPI Fact Sheet 7. Water Stress Index

Measures % water demand which is <40% of total available water resources in County catchment.



WSI Projections

Source(NWMP 2030)



Water Stress Index Per Catchment
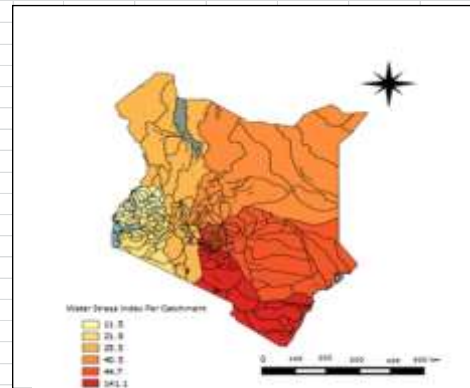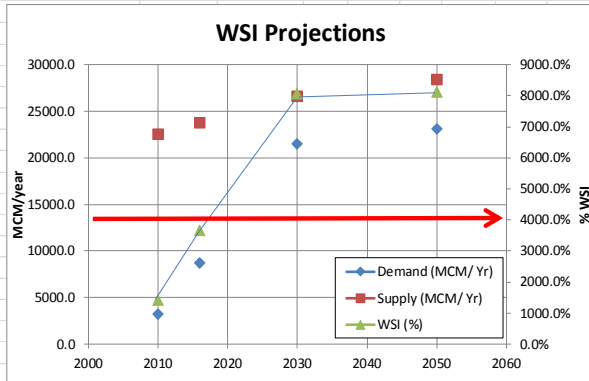
**WSI by Catchment Broken down by County**

| Catchment | Area (km²) | Counties | Water Demand (MCM/yr) | | | Available Water Resources (MCM/yr) | | | WSI | EPI Score | PTT >40 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2010 | 2030 | 2016 | 2010 | 2030 | 2016 | | | |
| Lake Victoria North Catchment Area(LVNCA) | 18,374 | Trans Nzoia | 228 | 1337 | 561 | 4742 | 5077 | 4843 | 11.58% | 345.46 | 100.00 |
| | | Bungoma | | | | | | | | 345.46 | 100.00 |
| | | Uasin Gishu | | | | | | | | 345.46 | 100.00 |
| | | Kakamega | | | | | | | | 345.46 | 100.00 |
| | | Busia | | | | | | | | 345.46 | 100.00 |
| | | Nandi | | | | | | | | 345.46 | 100.00 |
| | | Siaya | | | | | | | | 345.46 | 100.00 |
| | | Vihiga | | | | | | | | 345.46 | 100.00 |
| Lake Victoria South Catchment Area (LVSCA) | 31,734 | Kericho | 385 | 2953 | 1155 | 4976 | 5937 | 5264 | 21.95% | 182.25 | 100.00 |
| | | Kisumu | | | | | | | | 182.25 | 100.00 |
| | | Homa Bay | | | | | | | | 182.25 | 100.00 |
| | | Bomet | | | | | | | | 182.25 | 100.00 |
| | | Nyamira | | | | | | | | 182.25 | 100.00 |
| | | Narok | | | | | | | | 182.25 | 100.00 |
| | | Kisii | | | | | | | | 182.25 | 100.00 |
| | | Migori | | | | | | | | 182.25 | 100.00 |
| Rift Valley Catchment Area (RVCA) | 130,452 | Turkana | 357 | 1494 | 698 | 2559 | 3147 | 2735 | 25.52% | 156.73 | 100.00 |
| | | West Pokot | | | | | | | | 156.73 | 100.00 |
| | | Baringo | | | | | | | | 156.73 | 100.00 |
| | | Elgeyo-Marak | | | | | | | | 156.73 | 100.00 |
| | | Nakuru | | | | | | | | 156.73 | 100.00 |
| | | Nyandarua | | | | | | | | 156.73 | 100.00 |
| Ewaso Ng'iro North Catchment Area (ENNCA) | 210,226 | Marsabit | 212 | 2857 | 1006 | 2251 | 3011 | 2479 | 40.56% | 98.62 | 98.62 |
| | | Mandera | | | | | | | | 98.62 | 98.62 |
| | | Wajir | | | | | | | | 98.62 | 98.62 |
| | | Samburu | | | | | | | | 98.62 | 98.62 |
| | | Isiolo | | | | | | | | 98.62 | 98.62 |
| | | Laikipia | | | | | | | | 98.62 | 98.62 |
| | | Meru | | | | | | | | 98.62 | 98.62 |
| Tana Catchment Area (TCA) | 126,026 | Garissa | 891 | 8241 | 3096 | 6533 | 7828 | 6922 | 44.73% | 89.43 | 89.43 |
| | | Tharaka-Nith | | | | | | | | 89.43 | 89.43 |
| | | Nyeri | | | | | | | | 89.43 | 89.43 |
| | | Tana River | | | | | | | | 89.43 | 89.43 |
| | | Kitui | | | | | | | | 89.43 | 89.43 |
| | | Kirinyaga | | | | | | | | 89.43 | 89.43 |
| | | Embu | | | | | | | | 89.43 | 89.43 |
| | | Murang'a | | | | | | | | 89.43 | 89.43 |
| | | Lamu | | | | | | | | 89.43 | 89.43 |
| Athi Catchment Area (ACA) | 58,639 | Kiambu | 1,145 | 4586 | 2177 | 1503 | 1634 | 1542 | 141.17% | 28.33 | 28.33 |
| | | Machakos | | | | | | | | 28.33 | 28.33 |
| | | Kajiado | | | | | | | | 28.33 | 28.33 |
| | | Nairobi city | | | | | | | | 28.33 | 28.33 |
| | | Makueni | | | | | | | | 28.33 | 28.33 |
| | | Kilifi | | | | | | | | 28.33 | 28.33 |
| | | Taita-Taveta | | | | | | | | 28.33 | 28.33 |
| | | Kwale | | | | | | | | 28.33 | 28.33 |
| | | Mombasa | | | | | | | | 28.33 | 28.33 |
| **Total** | **575,451** | **National** | **3218** | **21468** | **8693** | **22564** | **26634** | **23785** | **36.55** | | |

Source (NWMP 2030)
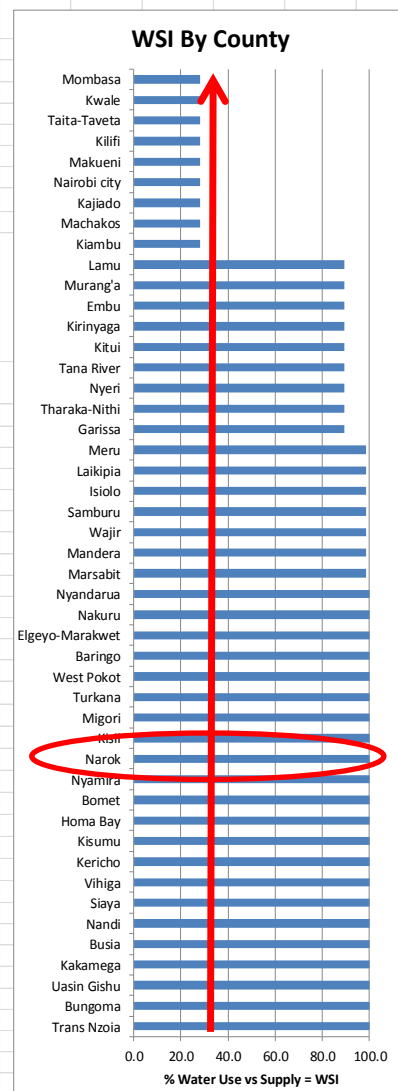
## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** High population growth demands water for domestic, industrial and agricultural use.

**Pressures:** Water scarcity implies vulnerability that water demand may exceed ability to renewal.

**State:** Water supply meets demand by >100%, county has a high water endowment.

**Impact:** Adequate levels of available water for human, agriculture, livestock and wildlife use.

**Response:** Investment needed in integrated water management and water storage infrastructure.

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## County EPI Fact Sheet 8. Wastewater treatment

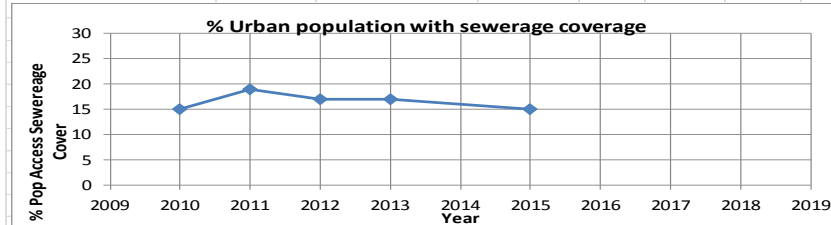Measures % urban population accessing formal sewerage and waste water treatment systems/plants.

**National Trend in Waste Water Treatment: 2010-2015**

| Year | 2010 | 2011 | 2012 | 2013 | 2015 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|
| % Population Serviced | 15 | 19 | 17 | 17 | 15 | | |
| EPI Score | 18.8 | 23.8 | 21.3 | 21.3 | 18.8 | | |

(Reference: WASREB 2016)

**Trendline in % Population Accessing Sewerage Coverage**



Source: (WASREB Impact Report 9)
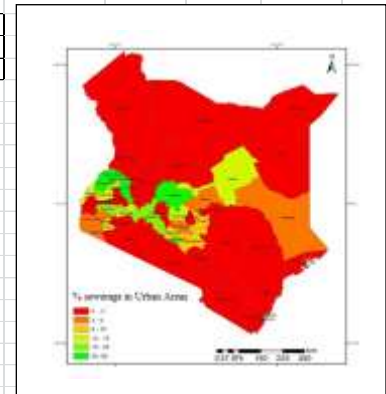
**% Urban Population with Sewerage Coverage in Counties**

| County | % Urban Population with Sewerage coverage | Names of towns with sewerage services | No. of towns with sewer services | EPI Score vs 80% |
|---|---|---|---|---|
| Nairobi City | 48.0 | Nairobi city | 1 | 60.0 |
| Laikipia | 39.0 | Nyahururu | 2 | 48.8 |
| Trans Nzoia | 31.0 | Kitale | 1 | 38.8 |
| Bungoma | 31.0 | Bungoma town | 1 | 38.8 |
| Uasin Gishu | 30.0 | Eldoret | 1 | 37.5 |
| Nakuru | 23.0 | Nakuru Naivasha | 2 | 28.8 |
| Kisumu | 18.0 | Kisumu town | 1 | 22.5 |
| Kericho | 15.0 | Kericho town | 1 | 18.8 |
| Kakamega | 15.0 | Kakamega Mumias | 2 | 18.8 |
| Busia | 13.0 | Busia town | 1 | 16.3 |
| Kisii | 13.0 | Kisii town | 1 | 16.3 |
| Isiolo | 12.0 | Isiolo town | 1 | 15.0 |
| Nyeri | 12.0 | Nyeri Mathira | 2 | 15.0 |
| Mombasa | 9.0 | Mombasa city | 1 | 11.3 |
| Machakos | 9.0 | Machakos, | 2 | 11.3 |
| Embu | 7.0 | Embu town | 1 | 8.8 |
| Kiambu | 6.0 | Kiambu town, Thika, Limuru, | 3 | 7.5 |
| Garissa | 5.0 | Garissa town | 1 | 6.3 |
| Meru | 4.0 | Meru town | 1 | 5.0 |
| Murang'a | 3.0 | Murang'a town | 1 | 3.8 |
| Homa Bay | 3.0 | Homa Bay town | 1 | 3.8 |
| Migori | 3.0 | Migori town | 0 | 3.8 |
| Kwale | 0.0 | none | 0 | 0.0 |
| Kilifi | 0.0 | none | 0 | 0.0 |
| Tana River | 0.0 | none | 0 | 0.0 |
| Lamu | 0.0 | none | 0 | 0.0 |
| Taita-Taveta | 0.0 | none | 0 | 0.0 |
| Wajir | 0.0 | none | 0 | 0.0 |
| Mandera | 0.0 | none | 0 | 0.0 |
| Marsabit | 0.0 | none | 0 | 0.0 |
| Tharaka-Nithi | 0.0 | none | 0 | 0.0 |
| Kitui | 0.0 | none | 0 | 0.0 |
| Makueni | 0.0 | none | 0 | 0.0 |
| Nyandarua | 0.0 | none | 0 | 0.0 |
| Kirinyaga | 0.0 | none | 0 | 0.0 |
| Turkana | 0.0 | none | 0 | 0.0 |
| West Pokot | 0.0 | none | 0 | 0.0 |
| Samburu | 0.0 | none | 0 | 0.0 |
| Elgeyo-Marakwet | 0.0 | none | 0 | 0.0 |
| Nandi | 0.0 | none | 0 | 0.0 |
| Baringo | 0.0 | none | 0 | 0.0 |
| Narok | 0.0 | none | 0 | 0.0 |
| Kajiado | 0.0 | none | 0 | 0.0 |
| Bomet | 0.0 | none | 0 | 0.0 |
| Vihiga | 0.0 | none | 0 | 0.0 |
| Siaya | 0.0 | none | 0 | 0.0 |
| Nyamira | 0.0 | none | 0 | 0.0 |

Source: WASREB Impact Report 9 (2015)



**% Urban Population with Sewerage coverage**
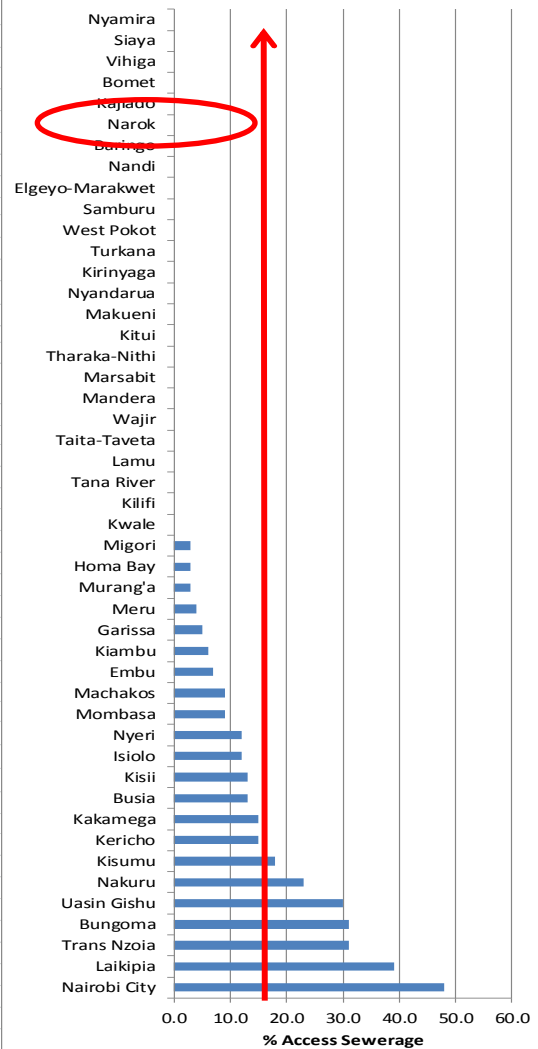
## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** High population growth exceeds County capacity & investment in sewerage services.

**Pressures:** Unregulated sewage and waste water disposal contaminates waterways a disease risk.

**State:** County has 0% sewage plant capacity for treating of wastewater.

**Impact:** Raw sewerage & effluents contaminate water ways, increasing water borne diseases.

**Response:** County to allocate more resources for infrastructure for wastewater treatment system.

## County EPI Fact Sheet 9. Tree Cover Loss

Measures % total cumulative tree loss from a baseline to present vs target to retain year 2000 % cover.

| 100.0 | % tree cover vs 2000 (Reference: SDG 2030) |

**Cumulative % National Tree Cover Loss vs 2000**

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Loss (ha) | | 19,027 | 20,288 | 13,553 | 16,988 | 12,745 | 20,656 | 26,103 | 19,224 | 17,696 | 22,693 | 17,300 | 17,899 | 13,564 | 15,357 | 15,616 | 19,048 | |
| Cumulative (ha) | | 19,027 | 39,315 | 52,868 | 69,856 | 82,601 | 103,258 | 129,361 | 148,585 | 166,281 | 188,974 | 206,274 | 224,173 | 237,737 | 253,094 | 268,709 | 287,757 | 287,757 |
| % Loss Vs 2000 | 3,319,481 | 0.57 | 1.18 | 1.59 | 2.10 | 2.49 | 3.11 | 3.90 | 4.48 | 5.01 | 5.69 | 6.21 | 6.75 | 7.16 | 7.62 | 8.09 | 8.67 | 8.67 |

(Reference: Global Forest Watch 2017)

**% Cumulative National Tree Cover Loss vs 2000**
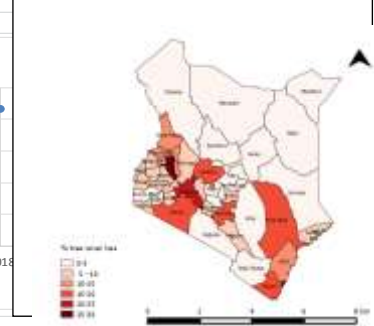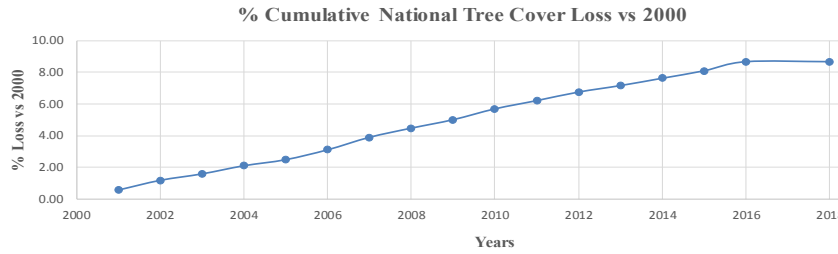


(Reference: Global Forest Watch 2017)

**County by County % Tree Cover Loss Vs 2000-2016**

| | County | Tree Cover (ha) (2000) | Cumulative Tree Cover Loss (ha) (2000-2016) | % Tree Cover loss vs 2000 | EPI Score (%) |
|---|---|---|---|---|---|
| 1 | Uasin Gishu | 35967 | 10454.0 | 29.1 | 70.9 |
| 2 | Mombasa | 3811 | 937.0 | 24.6 | 75.4 |
| 3 | Nakuru | 123401 | 27719.0 | 22.5 | 77.5 |
| 4 | Kwale | 88915 | 15406.0 | 17.3 | 82.7 |
| 5 | Narok | 334631 | 57526.0 | 17.2 | 82.8 |
| 6 | Machakos | 7795 | 1211.0 | 15.5 | 84.5 |
| 7 | Laikipia | 46229 | 6928.0 | 15.0 | 85.0 |
| 8 | Tana River | 60105 | 8893.0 | 14.8 | 85.2 |
| 9 | Kilifi | 160174 | 20381.0 | 12.7 | 87.3 |
| 10 | Elgeyo-Marakwet | 107099 | 12583.0 | 11.7 | 88.3 |
| 11 | Trans Nzoia | 51439 | 5227.0 | 10.2 | 89.8 |
| 12 | West Pokot | 100198 | 9997.0 | 10.0 | 90.0 |
| 13 | Nandi | 110192 | 10514.0 | 9.5 | 90.5 |
| 14 | Kericho | 141228 | 12942.0 | 9.2 | 90.8 |
| 15 | Siaya | 35124 | 2789.0 | 7.9 | 92.1 |
| 16 | Lamu | 244951 | 17879.0 | 7.3 | 92.7 |
| 17 | Kiambu | 67619 | 4900.0 | 7.2 | 92.8 |
| 18 | Nairobi City | 5242 | 361.0 | 6.9 | 93.1 |
| 19 | Busia | 22038 | 1508.0 | 6.8 | 93.2 |
| 20 | Bungoma | 71112 | 4832.0 | 6.8 | 93.2 |
| 21 | Bomet | 120634 | 7968.0 | 6.6 | 93.4 |
| 22 | Makueni | 29164 | 1886.0 | 6.5 | 93.5 |
| 23 | Baringo | 113989 | 7358.0 | 6.5 | 93.5 |
| 24 | Kakamega | 35908 | 2315.0 | 6.4 | 93.6 |
| 25 | Nyandarua | 86039 | 5474.0 | 6.4 | 93.6 |
| 26 | Kisumu | 26031 | 1593.0 | 6.1 | 93.9 |
| 27 | Embu | 33625 | 2051.0 | 6.1 | 93.9 |
| 28 | Migori | 14725 | 730.0 | 5.0 | 95.0 |
| 29 | Kajiado | 19468 | 917.0 | 4.7 | 95.3 |
| 30 | Kitui | 32855 | 1393.0 | 4.2 | 95.8 |
| 31 | Vihiga | 12042 | 504.0 | 4.2 | 95.8 |
| 32 | Nyamira | 45412 | 1667.0 | 3.7 | 96.3 |
| 33 | Murang'a | 83218 | 2531.0 | 3.0 | 97.0 |
| 34 | Turkana | 6308 | 156.0 | 2.5 | 97.5 |
| 35 | Homa Bay | 50462 | 1220.0 | 2.4 | 97.6 |
| 36 | Nyeri | 172307 | 3962.0 | 2.3 | 97.7 |
| 37 | Meru | 120912 | 2356.0 | 1.9 | 98.1 |
| 38 | Kirinyaga | 43860 | 784.0 | 1.8 | 98.2 |
| 39 | Taita-Taveta | 28346 | 458.0 | 1.6 | 98.4 |
| 40 | Kisii | 48734 | 652.0 | 1.3 | 98.7 |
| 41 | Tharaka-Nithi | 46119 | 500.0 | 1.1 | 98.9 |
| 42 | Isiolo | 117 | 1.0 | 0.9 | 99.1 |
| 43 | Garissa | 239156 | 1228.0 | 0.5 | 99.5 |
| 44 | Samburu | 84134 | 341.0 | 0.4 | 99.6 |
| 45 | Marsabit | 8614 | 10.0 | 0.1 | 99.9 |
| 46 | Mandera | 0 | 0.0 | 0.0 | 100.0 |
| 47 | Wajir | 32 | 0.0 | 0.0 | 100.0 |
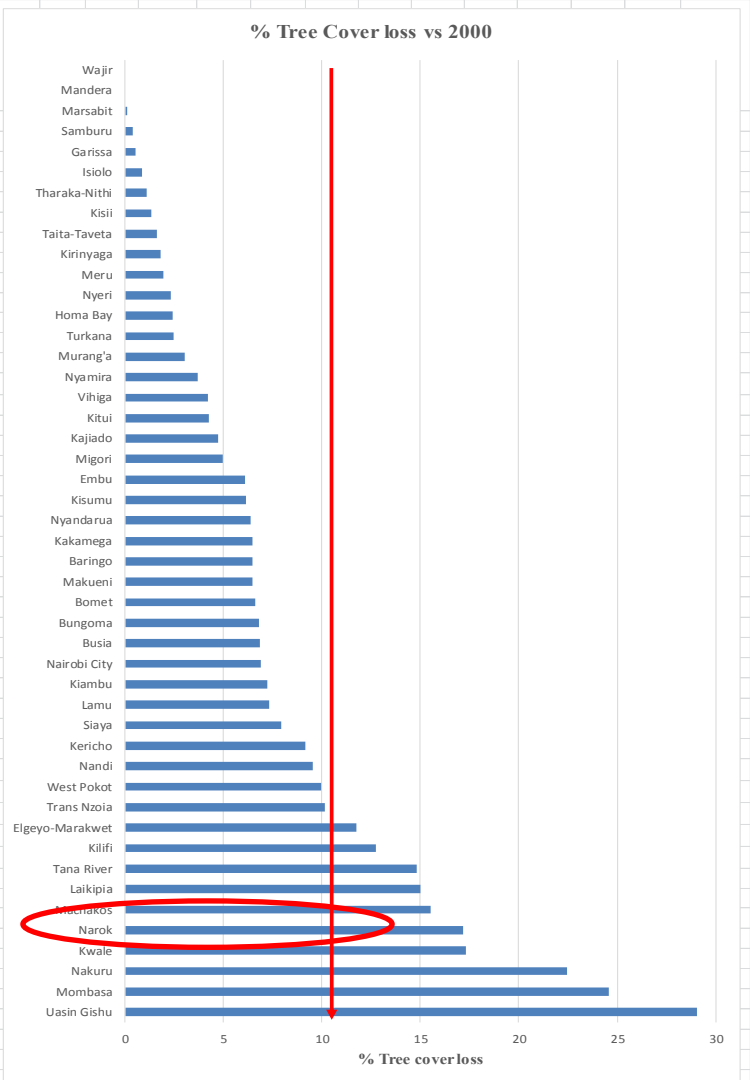
(Reference: Global Forest Watch 2017)



## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** Population growth and poverty increases demand for economic fuelwood and land.

**Pressures:** Deforestation due to agriculture expansion, illegal logging, charcoal burning, etc.

**State:** National 8% tree cover lost vs 2000, county at 17% ranks top 5 worst performing.

**Impact:** Degradation of forest eco-services such as fuelwood, wildlife, water towers, etc.

**Response:** Investment in land and forest management, tree planting & enforcement of laws.

**County EPI Fact Sheet 10. Climate Change Mainstreaming**

Measures % degree of climate change mainstreamed in National and County budgeting process.

**% National degree of Climate Change Mainstreaming in National Budgeting Processes**

| Year | 2013 | 2015 | 2017 | 2018 | 2020 |
|---|---|---|---|---|---|
| Rank | 5 | 5 | 5 | | |
| % Climate Change Mainstreaming in National budgeting processes | 100 | 100 | 100 | | |
| EPI Score | 100 | 100 | 100 | | |

(Reference: National Climate Change Action Plan (2013 – 2017))

**% Degree of Climate Change Mainstreaming in National Budgeting Processes**



% Degree of Climate Change Mainstreaming in National Budgeting Processes
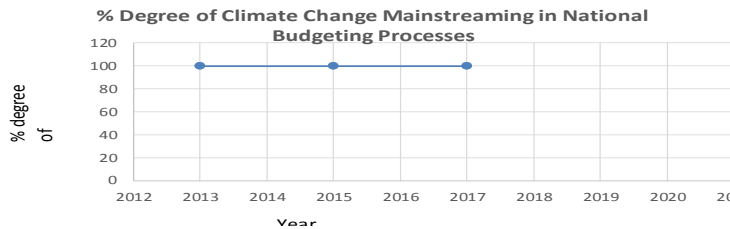


**% Degree of Climate Change Mainstreaming in CIDPs**

| County | Rank | % degree of climate change in CIDPs | EPI Score |
|---|---|---|---|
| Isiolo | 4 | 80 | 80 |
| Kitui | 4 | 80 | 80 |
| Trans Nzoia | 4 | 80 | 80 |
| Uasin Gishu | 4 | 80 | 80 |
| Laikipia | 4 | 80 | 80 |
| Nairobi City | 4 | 80 | 80 |
| Nyeri | 4 | 80 | 80 |
| Kiambu | 4 | 80 | 80 |
| Nyandarua | 4 | 80 | 80 |
| Tana River | 3 | 60 | 60 |
| Lamu | 3 | 60 | 60 |
| Taita-Taveta | 3 | 60 | 60 |
| Garissa | 3 | 60 | 60 |
| Wajir | 3 | 60 | 60 |
| Migori | 3 | 60 | 60 |
| Marsabit | 3 | 60 | 60 |
| Meru | 3 | 60 | 60 |
| Tharaka-Nithi | 3 | 60 | 60 |
| Embu | 3 | 60 | 60 |
| Homa Bay | 3 | 60 | 60 |
| Siaya | 3 | 60 | 60 |
| Makueni | 3 | 60 | 60 |
| Kirinyaga | 3 | 60 | 60 |
| Turkana | 3 | 60 | 60 |
| West Pokot | 3 | 60 | 60 |
| Samburu | 3 | 60 | 60 |
| Elgeyo-Marakwet | 3 | 60 | 60 |
| Nandi | 3 | 60 | 60 |
| Baringo | 3 | 60 | 60 |
| Nakuru | 3 | 60 | 60 |
| Narok | 3 | 60 | 60 |
| Kajiado | 3 | 60 | 60 |
| Kericho | 3 | 60 | 60 |
| Bomet | 3 | 60 | 60 |
| Kakamega | 3 | 60 | 60 |
| Vihiga | 3 | 60 | 60 |
| Bungoma | 3 | 60 | 60 |
| Busia | 3 | 60 | 60 |
| Kwale | 3 | 60 | 60 |
| Kilifi | 3 | 60 | 60 |
| Murang'a | 2 | 40 | 40 |
| Kisumu | 2 | 40 | 40 |
| Nyamira | 2 | 40 | 40 |
| Mandera | 2 | 40 | 40 |
| Machakos | 2 | 40 | 40 |
| Kisii | 1 | 20 | 20 |
| Mombasa | 1 | 20 | 20 |



% degree of climate change in CIDPs

% of Climate Change Mainstreaming in CIDPs
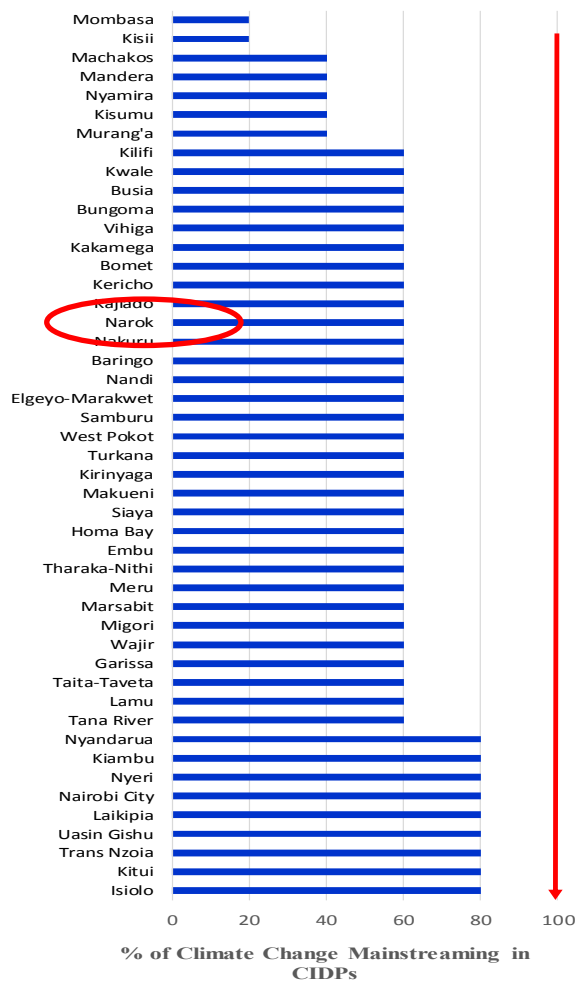
Criteria scale:(0 = 0%, 1=1-20%, 2=21-40%, 3=41-60%, 4=61-80%, 5=81-100%)

(Reference: Ministry of Environment and Forestry, 2017)

**SOER Drivers, Pressures, Status, Impact and Response (DPSIR)**

**Drivers:** Anthropogenic increase in greenhouse gas (GHG) emissions is altering climate.

**Pressure:** Climate change adversely affecting weather patterns, changing water cycle patterns.

**State:** National mainstreaming climate change is 100%, & CIDP budget is low at 60%.

**Impact:** Changing weather patterns, droughts, floods and lake level, affect power generation.

**Response:** Allocate more resources for climate change resilience, mitigation and adaptation, ie renewable energy, climate smart agriculture, rehabilitate forests, water storage, etc.

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# County EPI Fact Sheet 11. Capacity of Environmental Expertise

Measures % licensed EIA experts proportionate to 1:10,000 population as an ideal ratio for E&NRM.

**Growth in National EIA Experts Licenced from 2004-18**



**Growth in Number of licensed EIA experts**

(Reference: NEMA, 2018, KNBS (2014-2017)

**% of Licensed EIA Experts in County per 10,000 population 2016**



**% Experts vs Target**

| | County | No. of Licensed EIA experts (2016) | Population (2016) | % Licensed EIA Experts/ 10,000 Pop | Target Number of Licensed EIA Experts | EPI Score |
|---|---|---|---|---|---|---|
| 1 | Nairobi city | 960 | 4,463,149 | 215.1 | 446 | 100.0 |
| 2 | Mombasa | 65 | 1,184,988 | 54.9 | 118 | 54.9 |
| 3 | Kiambu | 100 | 1,868,208 | 53.5 | 187 | 53.5 |
| 4 | Kajiado | 40 | 870,721 | 45.9 | 87 | 45.9 |
| 5 | Nakuru | 77 | 2,031,247 | 37.9 | 203 | 37.9 |
| 6 | Kisumu | 42 | 1,132,264 | 37.1 | 113 | 37.1 |
| 7 | Embu | 19 | 559,766 | 33.9 | 56 | 33.9 |
| 8 | Uasin Gishu | 33 | 1,132,603 | 29.1 | 113 | 29.1 |
| 9 | Nyeri | 23 | 798,428 | 28.8 | 80 | 28.8 |
| 10 | Machakos | 33 | 1,191,325 | 27.7 | 119 | 27.7 |
| 11 | Isiolo | 4 | 155,465 | 25.7 | 16 | 25.7 |
| 12 | Elgeyo-Marakwet | 12 | 468,835 | 25.6 | 47 | 25.6 |
| 13 | Tharaka-Nithi | 9 | 396,115 | 22.7 | 40 | 22.7 |
| 14 | Kisii | 28 | 1,346,547 | 20.8 | 135 | 20.8 |
| 15 | Kericho | 19 | 944,576 | 20.1 | 94 | 20.1 |
| 16 | Baringo | 14 | 703,697 | 19.9 | 70 | 19.9 |
| 17 | Laikipia | 10 | 505,712 | 19.8 | 51 | 19.8 |
| 18 | Taita-Taveta | 7 | 358,173 | 19.5 | 36 | 19.5 |
| 19 | Homa Bay | 22 | 1,126,270 | 19.5 | 113 | 19.5 |
| 20 | Meru | 26 | 1,470,801 | 17.7 | 147 | 17.7 |
| 21 | Garissa | 11 | 623,060 | 17.7 | 62 | 17.7 |
| 22 | Makueni | 16 | 959,022 | 16.7 | 96 | 16.7 |
| 23 | Trans Nzoia | 17 | 1,037,455 | 16.4 | 104 | 16.4 |
| 24 | Siaya | 16 | 984,251 | 16.3 | 98 | 16.3 |
| 25 | Kilifi | 22 | 1,399,975 | 15.7 | 140 | 15.7 |
| 26 | Kitui | 17 | 1,097,687 | 15.5 | 110 | 15.5 |
| 27 | Murang'a | 15 | 1,084,871 | 13.8 | 108 | 13.8 |
| 28 | Wajir | 9 | 661,941 | 13.6 | 66 | 13.6 |
| 29 | Kirinyaga | 8 | 607,881 | 13.2 | 61 | 13.2 |
| 30 | Nyamira | 9 | 699,113 | 12.9 | 70 | 12.9 |
| 31 | Bungoma | 19 | 1,553,434 | 12.2 | 155 | 12.2 |
| 32 | Nyandarua | 8 | 686,379 | 11.7 | 69 | 11.7 |
| 33 | Kakamega | 20 | 1,875,531 | 10.7 | 188 | 10.7 |
| 34 | Nandi | 10 | 953,978 | 10.5 | 95 | 10.5 |
| 35 | Bomet | 9 | 916,175 | 9.8 | 92 | 9.8 |
| 36 | Migori | 9 | 1,071,803 | 8.4 | 107 | 8.4 |
| 37 | Narok | 9 | 1,077,719 | 8.4 | 108 | 8.4 |
| 38 | Vihiga | 5 | 626,707 | 8.0 | 63 | 8.0 |
| 39 | Lamu | 1 | 128,144 | 7.8 | 13 | 7.8 |
| 40 | Kwale | 6 | 820,199 | 7.3 | 82 | 7.3 |
| 41 | Marsabit | 2 | 315,936 | 6.3 | 32 | 6.3 |
| 42 | West Pokot | 4 | 649,418 | 6.2 | 65 | 6.2 |
| 43 | Busia | 5 | 840,251 | 6.0 | 84 | 6.0 |
| 44 | Samburu | 1 | 283,780 | 3.5 | 28 | 3.5 |
| 45 | Turkana | 3 | 855,399 | 3.5 | 86 | 3.5 |
| 46 | Mandera | 3 | 1,025,756 | 2.9 | 103 | 2.9 |
| 47 | Tana River | 0 | 303,077 | 0 | 30 | 0.0 |
| | **Total** | **1,797** | **45,847,832** | **39.2** | **4585** | **39.2** |

(Reference: NEMA, database 2018)

## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** Population and economic growth, place greater demand on limited expertise capacity.

**Pressure:** Limited skilled experts means improper EIA, low capacity for audits & enforcement.

**State:** County is ranked 37th, with low 8.5% of the E&NRM expertise required.

**Impact:** Inadequate E&NRM compliance, insufficient promotion of green & blue technology.

**Response:** County to invest more in capacity building and hiring of environmental experts.

## County EPI Fact Sheet 12. Literacy Levels

Measures % of population >15 who can both read and write, thereby understand their E&NRM role.

**National % Literacy Levels for Population Over the Age of 15 (2000 – 2015)**

| Year | 2000 | 2007 | 2015 | 2016 | 2018 |
|------|------|------|------|------|------|
| Literacy levels (%) | 82.23 | 72.16 | 78.02 | | |

(Reference: World Data Atlas, Knoema, 2016)

**National % Literacy Levels for Population Over the Age of 15 (2000 – 2015)**



National trends in Adult Literacy Levels (%)
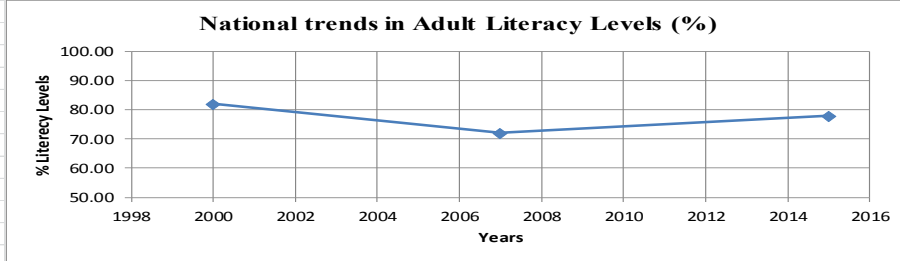
(Reference: World Data Atlas, Knoema, 2016)

**County Literacy Levels for Population Above the Age of 15**

| | County | Literacy Levels (%) |
|---|--------|---------------------|
| 1 | Kiambu | 98.00 |
| 2 | Laikipia | 97.40 |
| 3 | Nyeri | 96.60 |
| 4 | Kirinyaga | 96.30 |
| 5 | Elgeyo-Marakwet | 95.60 |
| 6 | Embu | 95.50 |
| 7 | Baringo | 95.10 |
| 8 | Nandi | 94.90 |
| 9 | Nyandarua | 94.60 |
| 10 | Kisumu | 94.50 |
| 11 | Kericho | 94.10 |
| 12 | Bungoma | 93.60 |
| 13 | Vihiga | 93.20 |
| 14 | Siaya | 92.50 |
| 15 | Uasin Gishu | 92.30 |
| 16 | Kitui | 91.50 |
| 17 | Kakamega | 90.50 |
| 18 | Nairobi city | 89.00 |
| 19 | Isiolo | 88.00 |
| 20 | Trans Nzoia | 87.70 |
| 21 | Lamu | 87.30 |
| 22 | Makueni | 86.60 |
| 23 | Taita-Taveta | 86.10 |
| 24 | Murang'a | 86.00 |
| 25 | Machakos | 85.00 |
| 26 | Nyamira | 84.60 |
| 27 | Mombasa | 82.70 |
| 28 | Turkana | 82.00 |
| 29 | Kilifi | 79.60 |
| 30 | Kwale | 78.20 |
| 31 | Busia | 78.20 |
| 32 | Nakuru | 78.00 |
| 33 | Tharaka-Nithi | 78.00 |
| 34 | Samburu | 78.00 |
| 35 | Migori | 78.00 |
| 36 | Meru | 78.00 |
| 37 | Marsabit | 78.00 |
| 38 | Mandera | 78.00 |
| 39 | Bomet | 78.00 |
| 40 | Kajiado | 77.10 |
| 41 | Narok | 76.40 |
| 42 | Wajir | 76.00 |
| 43 | Kisii | 74.00 |
| 44 | West Pokot | 73.00 |
| 45 | Homa bay | 71.00 |
| 46 | Tana River | 60.90 |
| 47 | Garissa | 52.10 |

(Reference: Knoema, 2016)
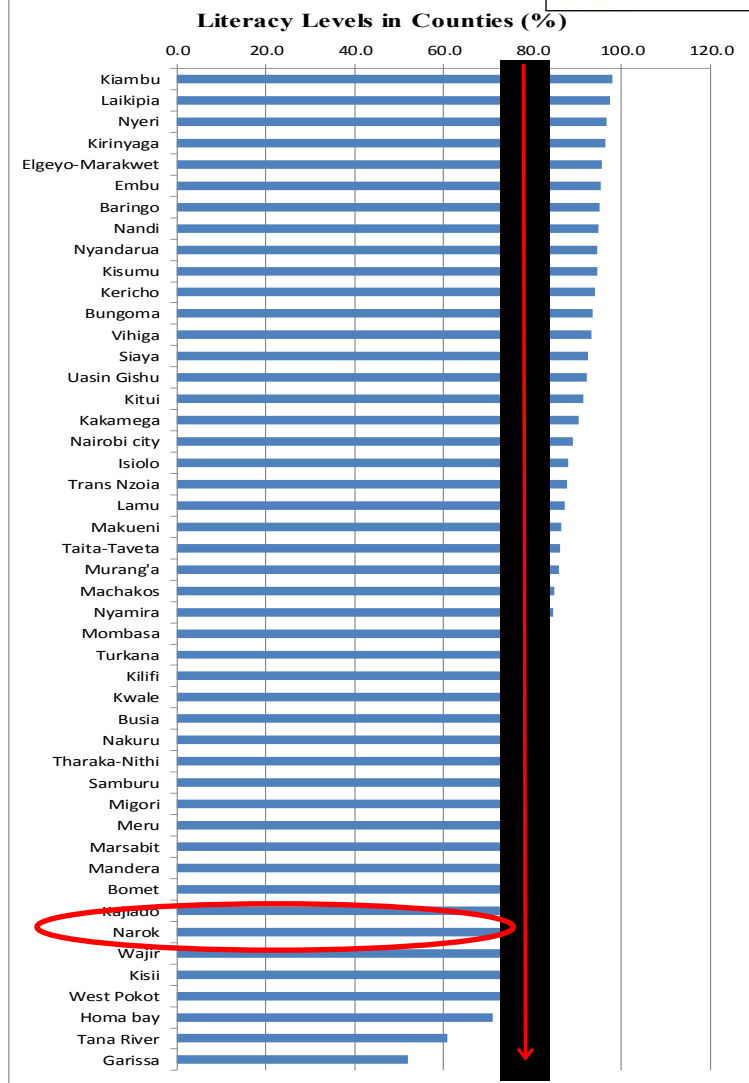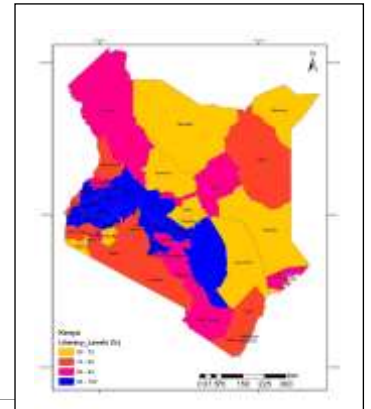


Literacy Levels in Counties (%)

**SOER Drivers, Pressures, Status, Impact and Response (**DPSIR)

**Drivers:** Population growth exceeds education system capacity to teach literacy and E&NRM.

**Pressure:** Poor literacy is correlated with poor understanding of E&NRM & sustainable use.

**State:** County adult literacy is average 76%, ranked bottom 6 below national average 78%.

**Impact:** Poor E&NRM awareness, increases incidences of bad environment related behaviour.

**Response:** Continued County investment in literacy and E&NRM education in the curriculum.

## County EPI Fact Sheet 13. Expenditure on E&NRM

Measures % of E&NRM expenditure vs County total as % of E&NR worth vs GDP baseline of 35%.

**% Contribution of E&NRM Sectors to GDP as National Target:**

| Sector | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Agriculture, Forestry & Fishing | 26.4 | 27.5 | 30.2 | 32.1 | 31.5 |
| Mining and Quarrying | 0.9 | 0.8 | 0.9 | 0.8 | 0.8 |
| Electricity Supply (renewable) | 1.1 | 1 | 1.4 | 1.8 | 1.8 |
| Water supply; Sewerage, Waste | 0.9 | 0.8 | 0.7 | 0.7 | 0.7 |
| **Total Contribution** | **29.3** | **30.1** | **33.2** | **35.4** | **34.8** |

(Reference: Economic Survey Report, 2018)

**Expenditure by MDAs in E&NRM Sectors for FY 2016/17 (Kshs. Millions)**

| Ministry/ State Department | Net Expenditure |
|---|---|
| Water Services | 29,889.30 |
| Irrigation | 6,372.60 |
| Environment | 1,663.20 |
| Natural Resources (Forestry) | 1,546.10 |
| Agriculture | 9,442.10 |
| Livestock | 1,808.90 |
| Fisheries & Blue Economy | 1,570.70 |
| Mining | 1,310.10 |
| Tourism (& wildlife) | 3,375.50 |
| **Total E&NRM Sectors:** | **56,978.50** |
| **Total Net Expenditure in All Sectors** | **557,166.00** |
| **% Expenditure in E&NRM Vs Total:** | **10.23** |
| **EPI Score** | **29.39** |

Source: Office of the Controller of Budget, Annual National Governments Budget Implementation Review Report (2017)



% of County Expenditure on E&NRM vs the total expenditure

0 – 20
20 – 40
40 – 60
60 – 80
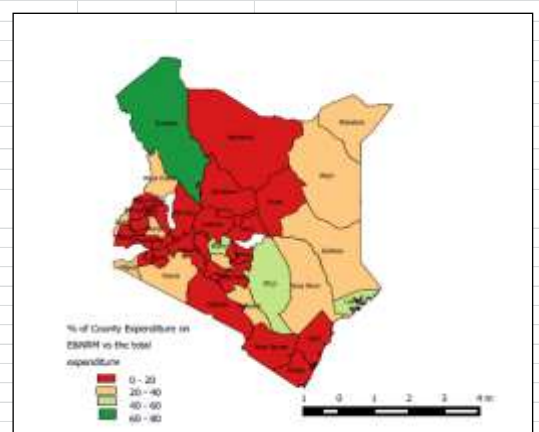
**Expenditure by County E&NRM Sectors for FY 2016/17 (Kshs. Millions)**

| | County | Total Expenditure in all sectors (Kshs. Mill) | Expenditure on E&NRM Sectors (Kshs. Mill) | % of County Expenditure on E&NRM vs the total | EPI Score | PTT |
|---|---|---|---|---|---|---|
| 1 | Mombasa | 9133.57 | 260.76 | 2.85 | 8.20 | 8.20 |
| 2 | Vihiga | 3718.67 | 156.44 | 4.21 | 12.09 | 12.09 |
| 3 | Laikipia | 4710.66 | 274.8 | 5.83 | 16.76 | 16.76 |
| 4 | Taita-Taveta | 3385.05 | 226.09 | 6.68 | 19.19 | 19.19 |
| 5 | Kakamega | 10845.12 | 836.98 | 7.72 | 22.18 | 22.18 |
| 6 | Kisii | 7985.61 | 684.2 | 8.57 | 24.62 | 24.62 |
| 7 | Kisumu | 6837.85 | 664.55 | 9.72 | 27.93 | 27.93 |
| 8 | Embu | 5669.24 | 580.58 | 10.24 | 29.43 | 29.43 |
| 9 | Kiambu | 10811.57 | 1199.05 | 11.09 | 31.87 | 31.87 |
| 10 | Kericho | 5600.72 | 636.29 | 11.36 | 32.65 | 32.65 |
| 11 | Nairobi city | 24858.64 | 2905.8 | 11.69 | 33.59 | 33.59 |
| 12 | Tharaka-Nithi | 2773.85 | 329.75 | 11.89 | 34.16 | 34.16 |
| 13 | Machakos | 9148.77 | 1088.67 | 11.90 | 34.19 | 34.19 |
| 14 | Trans Nzoia | 6004.44 | 717.05 | 11.94 | 34.32 | 34.32 |
| 15 | Homa bay | 5737.16 | 693.44 | 12.09 | 34.73 | 34.73 |
| 16 | Siaya | 5630.16 | 688.13 | 12.22 | 35.12 | 35.12 |
| 17 | Nakuru | 10663.22 | 1322.47 | 12.40 | 35.64 | 35.64 |
| 18 | Nyandarua | 4963.02 | 627.7 | 12.65 | 36.34 | 36.34 |
| 19 | Bomet | 5303.97 | 685.97 | 12.93 | 37.16 | 37.16 |
| 20 | Samburu | 4167.1 | 539.47 | 12.95 | 37.20 | 37.20 |
| 21 | Nyamira | 4501.6 | 603.52 | 13.41 | 38.53 | 38.53 |
| 22 | Kirinyaga | 4246.58 | 576.04 | 13.56 | 38.98 | 38.98 |
| 23 | Bungoma | 7992.16 | 1123.15 | 14.05 | 40.38 | 40.38 |
| 24 | Kajiado | 5061.92 | 732.62 | 14.47 | 41.59 | 41.59 |
| 25 | Kwale | 5860.64 | 888.81 | 15.17 | 43.58 | 43.58 |
| 26 | Meru | 8344.02 | 1360.52 | 16.31 | 46.85 | 46.85 |
| 27 | Kilifi | 10184.21 | 1712.5 | 16.82 | 48.32 | 48.32 |
| 28 | Elgeyo-Marakwet | 3964.68 | 703.58 | 17.75 | 50.99 | 50.99 |
| 29 | Baringo | 5214.39 | 929.98 | 17.83 | 51.25 | 51.25 |
| 30 | Marsabit | 6141.49 | 1167.11 | 19.00 | 54.61 | 54.61 |
| 31 | Isiolo | 3493.1 | 668.47 | 19.14 | 54.99 | 54.99 |
| 32 | Uasin Gishu | 5594.57 | 1078.42 | 19.28 | 55.39 | 55.39 |
| 33 | Wajir | 8242.89 | 1936.95 | 23.50 | 67.52 | 67.52 |
| 34 | Makueni | 8922.51 | 2255.64 | 25.28 | 72.64 | 72.64 |
| 35 | Mandera | 10196.94 | 2704.9 | 26.53 | 76.23 | 76.23 |
| 36 | Murang'a | 6432 | 1832.29 | 28.49 | 81.86 | 81.86 |
| 37 | Narok | 7473.71 | 2231.75 | 29.86 | 85.81 | 85.81 |
| 38 | Migori | 5816.62 | 1892.14 | 32.53 | 93.48 | 93.48 |
| 39 | Garissa | 7123.5 | 2649.5 | 37.19 | 106.88 | 100.00 |
| 40 | West Pokot | 4804.09 | 1850.73 | 38.52 | 110.70 | 100.00 |
| 41 | Busia | 5881.4 | 2279.4 | 38.76 | 111.37 | 100.00 |
| 42 | Nandi | 5364.9 | 2128.18 | 39.67 | 113.99 | 100.00 |
| 43 | Tana River | 3546.37 | 1408.18 | 39.71 | 114.10 | 100.00 |
| 44 | Kitui | 8314.6 | 3339.41 | 40.16 | 115.41 | 100.00 |
| 45 | Lamu | 1993.53 | 840.83 | 42.18 | 121.20 | 100.00 |
| 46 | Nyeri | 5685.1 | 2936.73 | 51.66 | 148.44 | 100.00 |
| 47 | Turkana | 11191.41 | 7071.97 | 63.19 | 181.58 | 100.00 |



**% of County Expenditure on E&NRM vs Total Expenditure in all Sectors**

Source: Office of the Controller of Budget, Annual County Governments Budget Implementation Review Report (2017)
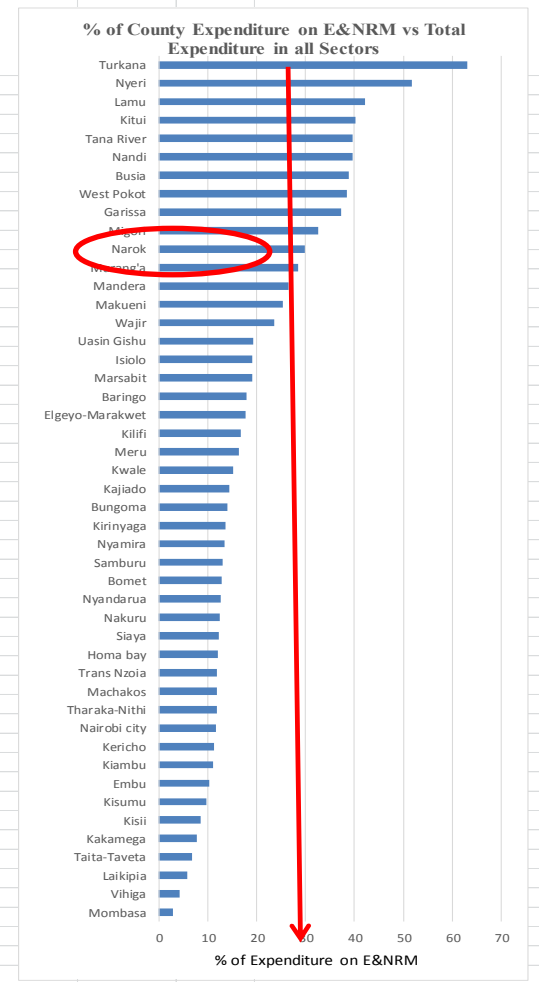
## SOER Drivers, Pressures, Status, Impact and Response (DPSIR)

**Drivers:** If E&NRM budget does not match GDP County cannot sustain a green/blue economy

**Pressure:** Low County expenditure means poor enforcement and unsustainable E&NR use.

**State:** E&NRM expenditure of CIDP is average 30% overall, ranking as top 10.

**Impact:** Low investment leads to poor E&NRM brings a brown growth trajectory.

**Response** Increase E&NRM allocations in CIDP to match E&NR sector economic contribution.

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