Local engagement: Ecohydrology at Lake Naivasha, Kenya

David Harper, Emeritus Professor, University of Leicester

Why me, why Naivasha?

- Naivasha research since 1982
- UNESCO Ecohydrology programme (1995) since 1997
- Three principles make Ecohydrology the tool of IWRM
- Lake Naivasha EH Demonstration Site 2003, Help Basin 2004
- Naivasha EH ‘Global Reference Operational Site’ 2011

UNESCO Ecohydrology

Zalewski, Janauer, Jolanki (1997)

H1: Hydrology regulates biota and vice versa in natural ecosystems

H2: The biota can thus be used as a tool to regulate hydrological and hydrochemical processes in restoration

H3: These two types of regulations can be integrated with *other measures* to enhance aquatic processes and thus achieve sustainable ecosystem services for people

Naivasha

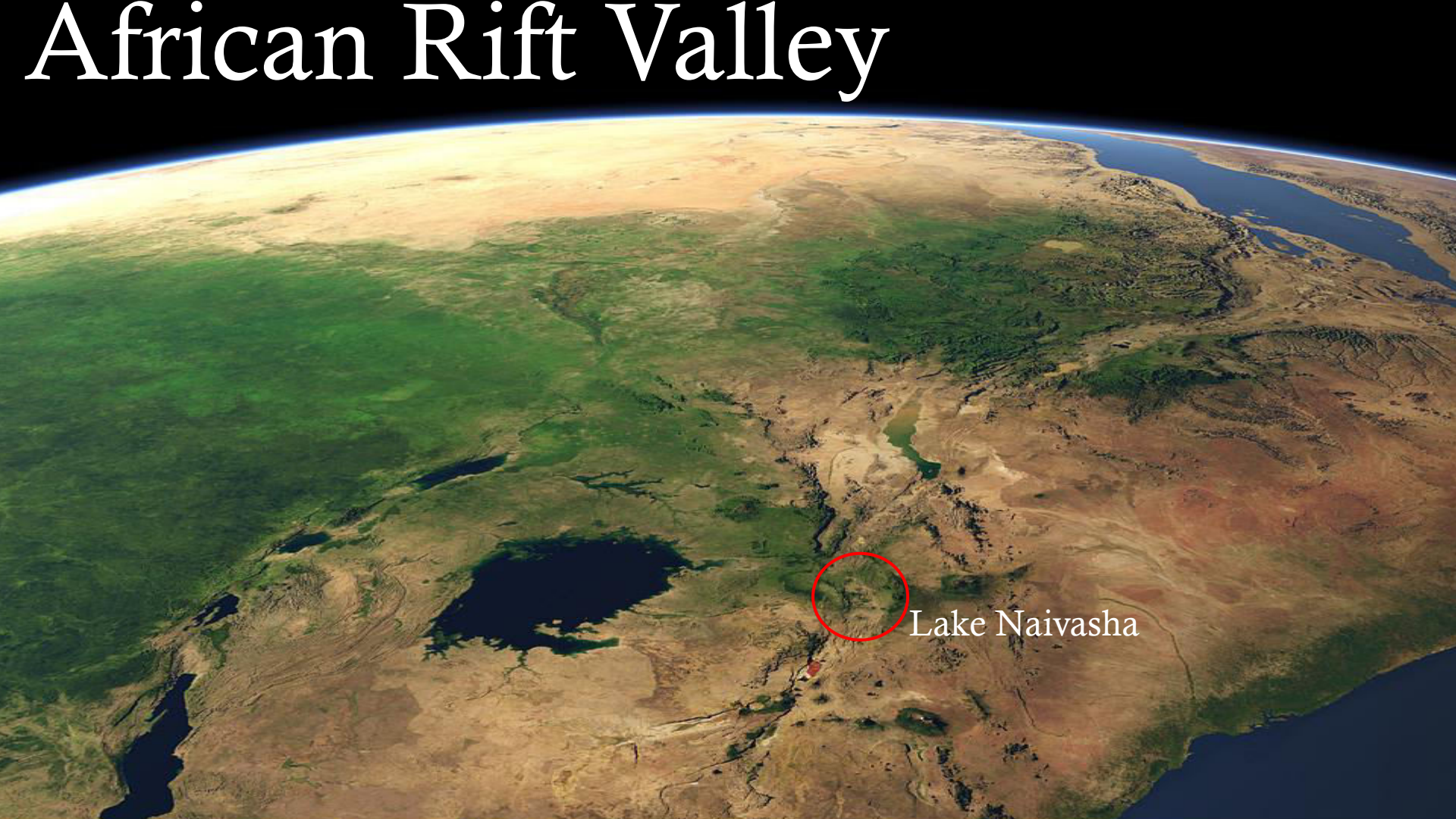
H1: Unpredictable climate (ITCZ) created unique "drawdown zone" (50+ plant families), 350+ bird species, large hippopotamus population…..

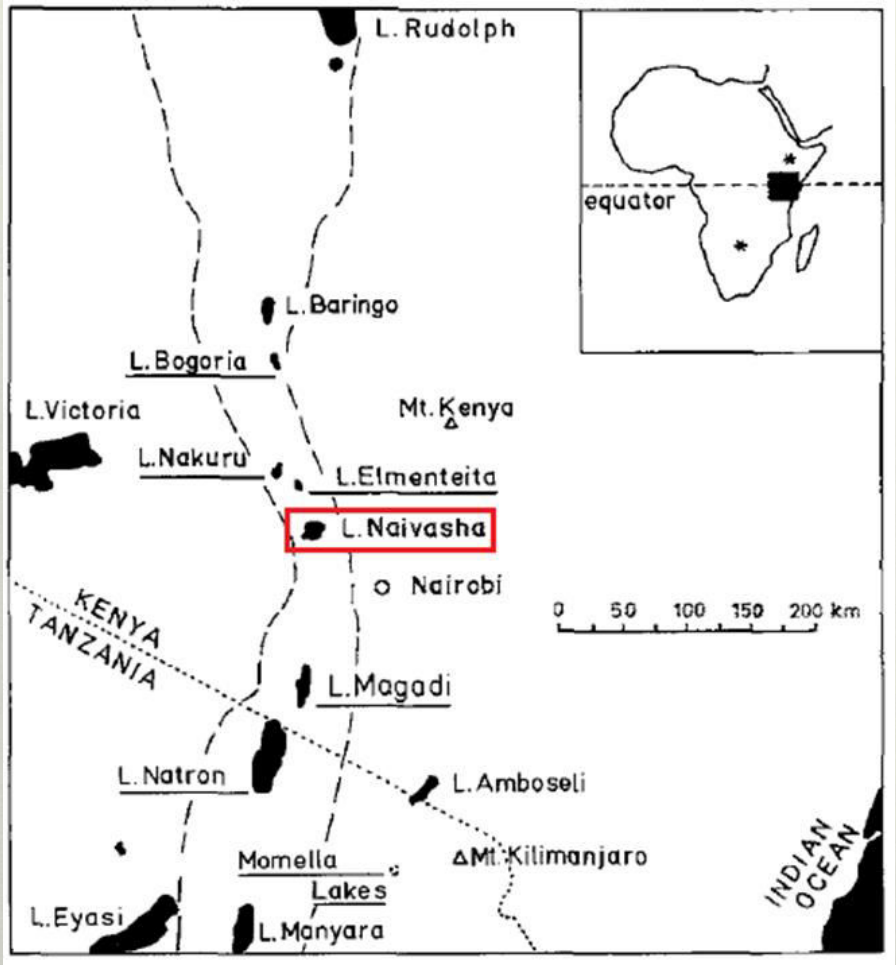
Fringing *Cyperus papyrus* swamps regulate hydrology and hydrochemistry (Gaudet, 1977; 2014)

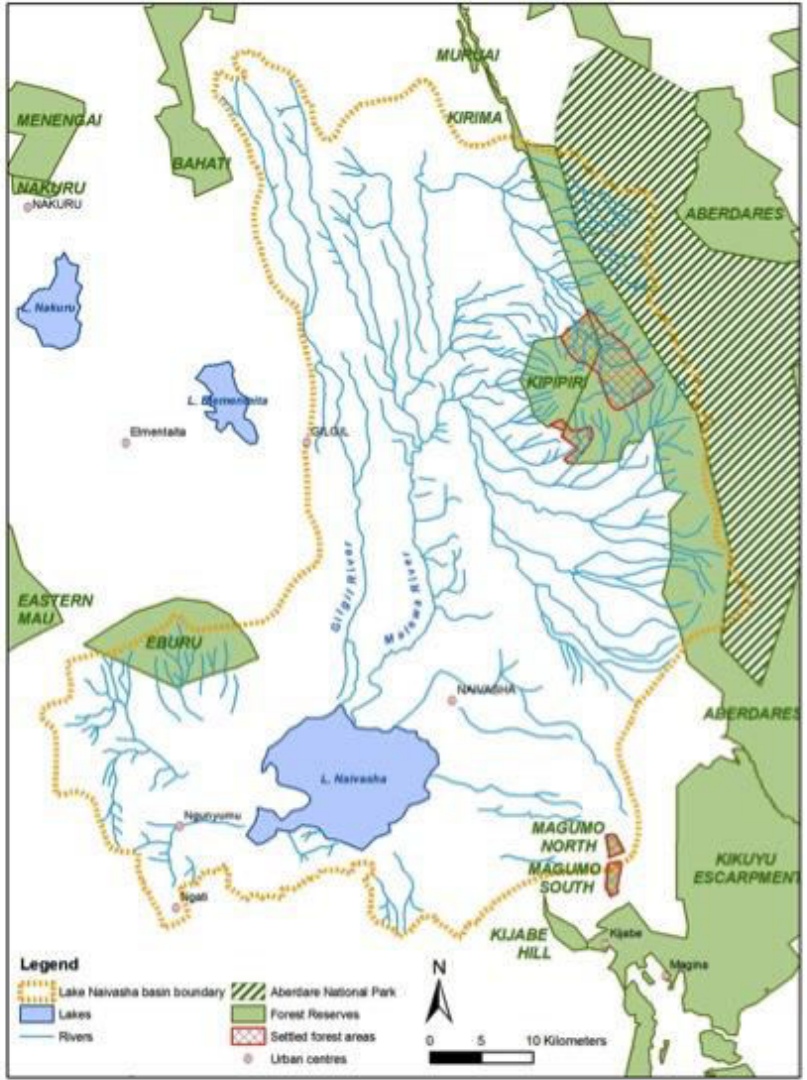
H2: Papyrus reduced by 90% (Morrison & Harper 2009) in a now eutrophic lake. Restoration could control nutrient increase to mitigate worst effects of nutrients

H3: Riparian understanding can reconnect people with their lake and rivers so that restoration can succeed

African Rift Valley



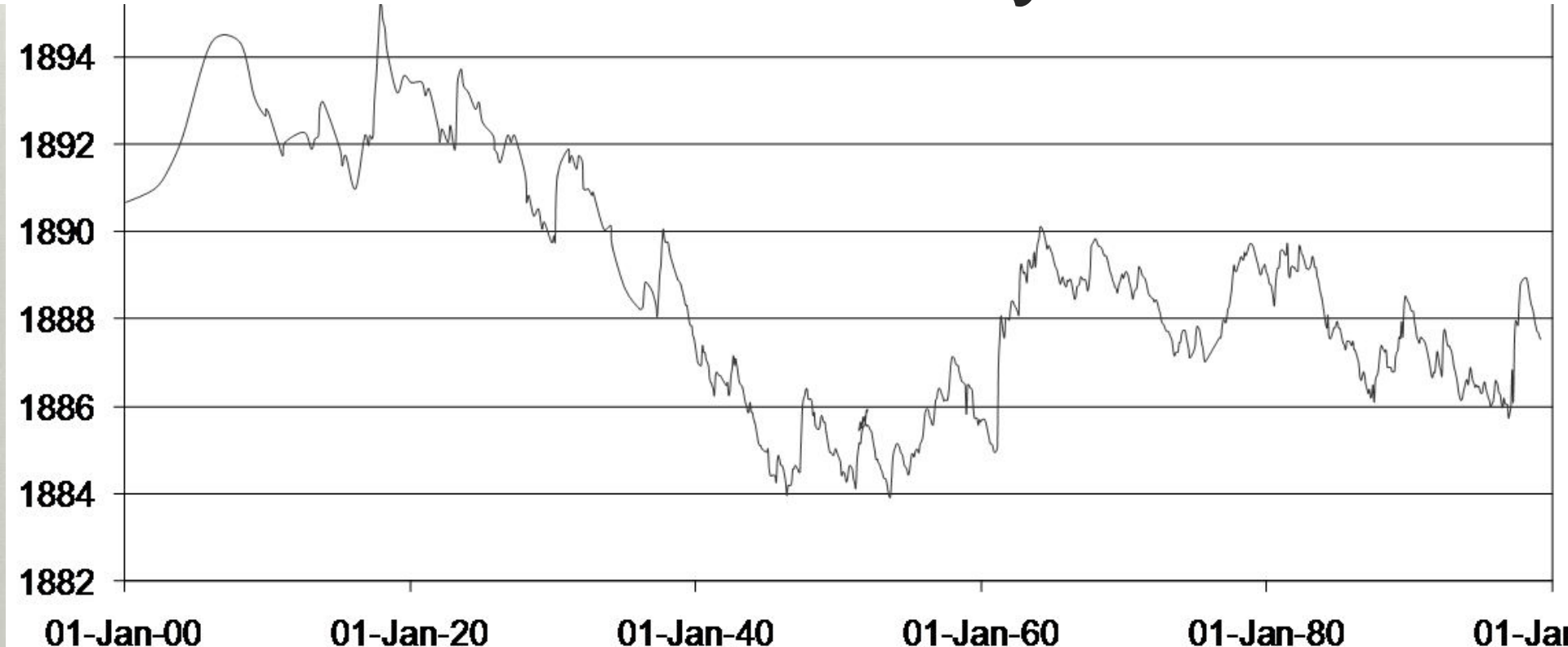

L. Rudolph
equator
L. Baringo
L. Bogoria
L. Victoria
Mt. Kenya
L. Nakuru
L. Elmenteita
L. Naivasha
Nairobi
0 50 100 150 200 km
KENYA
TANZANIA
L. Magadi
L. Natron
L. Amboseli
Mt. Kilimanjaro
Momella
Lakes
L. Eyasi
L. Manyara
INDIAN OCEAN


MUHOTAI
MENENGAI
KIRIMA
BAHATI
NAKURU
NAKURU
ABERDARES
L. Nakuru
KIPIPIRI
Elmentaita
GILGIL
EASTERN MAU
EBURU
Malewa River
Gilgil River
NAIVASHA
ABERDARES
L. Naivasha
Ngutuyumu
MAGUMO NORTH
MAGUMO SOUTH
KIKUYU ESCARPMENT
Ngati
KIJABE HILL
Kijabe
Magina
Legend
Lake Naivasha basin boundary
Lakes
Rivers
Aberdare National Park
Forest Reserves
Settled forest areas
Urban centres
N
0 5 10 Kilometers

Naivasha's importance

- 70% of Kenya's flower exports (£260M p.a.)
- 40% of the EU's supermarket trade
- 20% of Kenya's vegetables exports, £25M p.a.
- together 10% of Kenya's total foreign exchange
- major centre for tourism (1.8M tourists, 4,000 beds).
- Africa's first geothermal power station (30% of Kenya's power)
- artisanal fishery protein for quarter of a million people.

Naivasha's ecohydrology – H1 20th Century



H1 20th Century

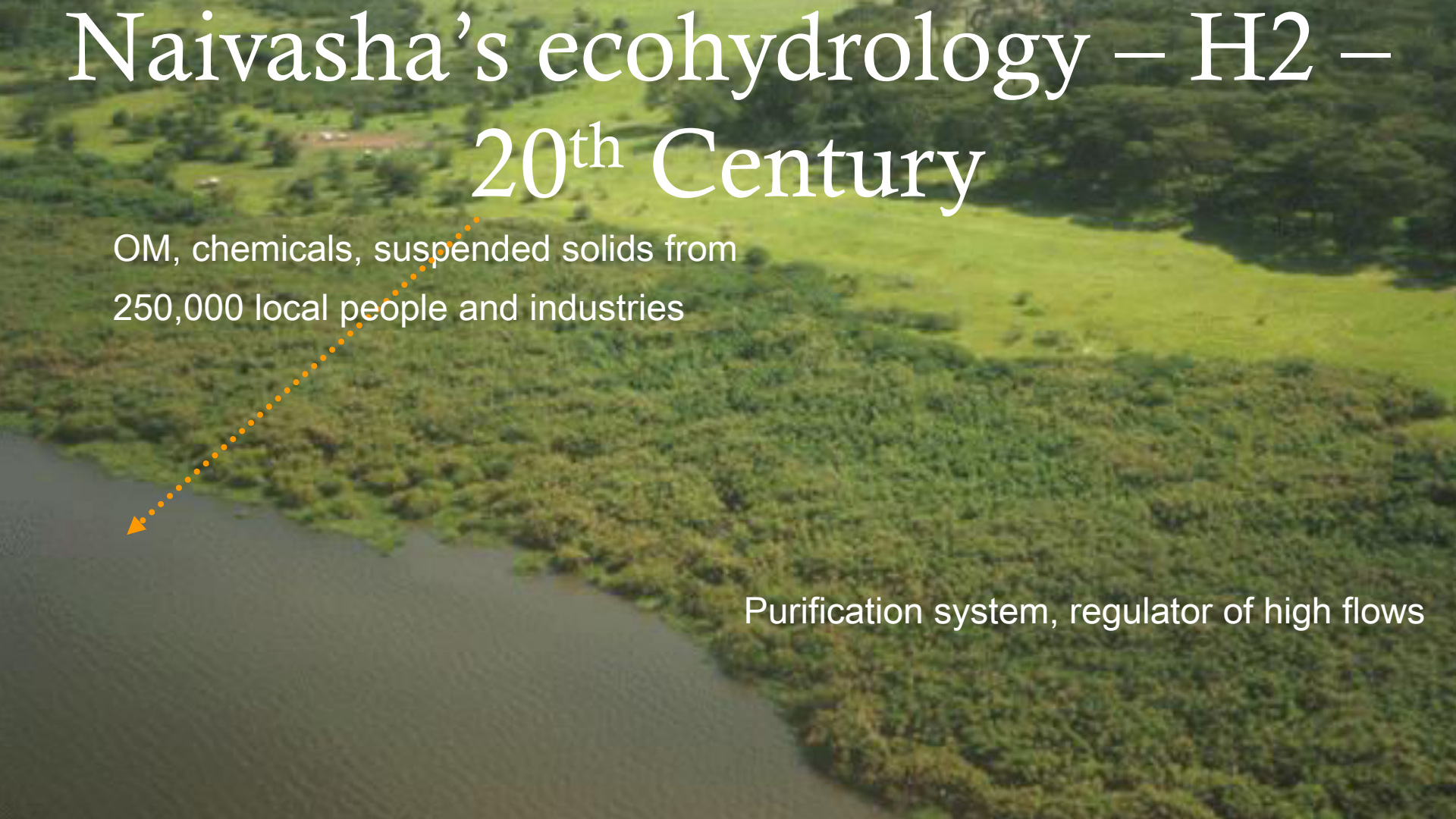




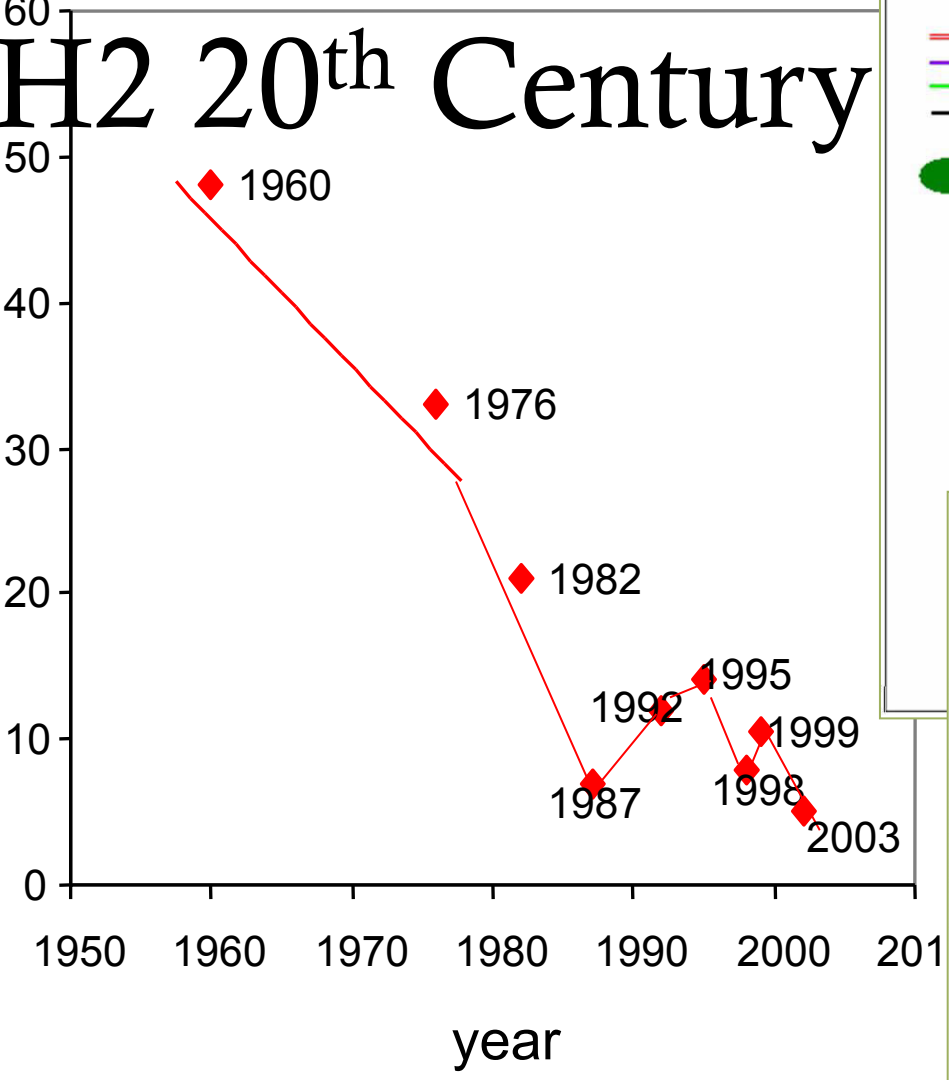


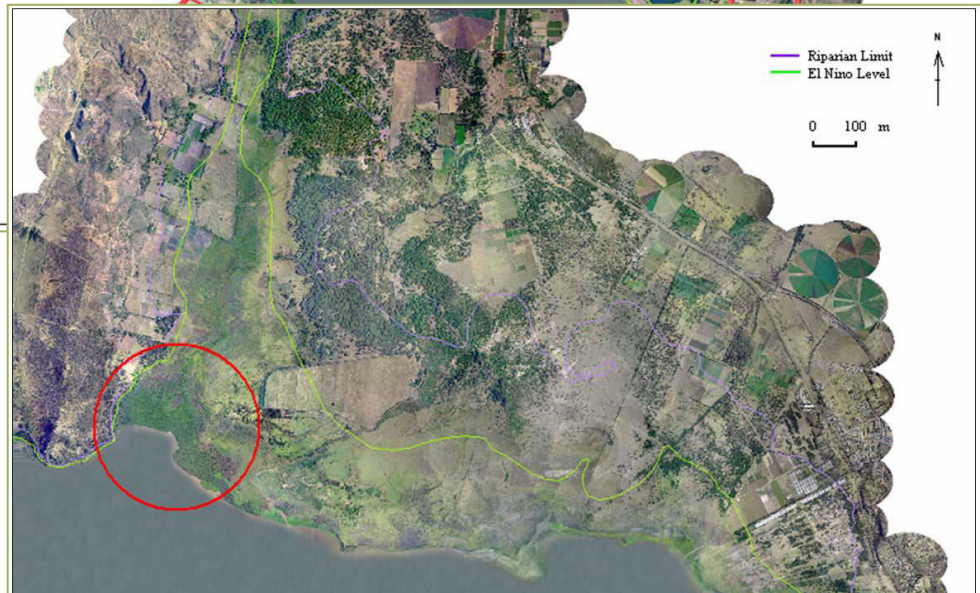


Naivasha's ecohydrology – H2 – 20th Century



H2 20th Century





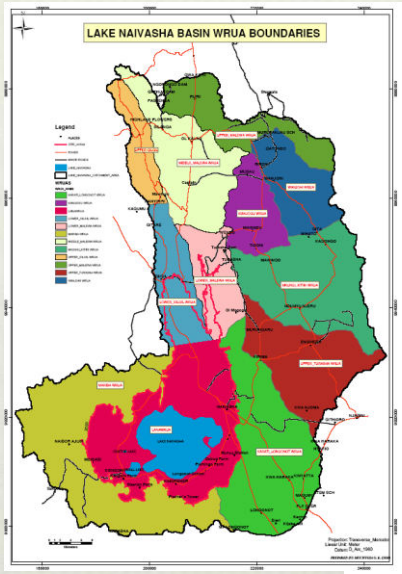
– H2 20th Century


– H3 (i) – 21st Century
lagoon
weir
Gilgil river
to lake

– H3(i) – 21st Century

H3 (ii) – 2010 - 2015

- Water Act 2002, Gazetted 2005, Operational 2009
- 12 WRUAs (Water Resource User Associations)
- HRH Prince of Wales catalyst for creation of ‘Imarisha Naivasha’ - ‘empower’
- SDAP



IMARISHA NAIVASHA

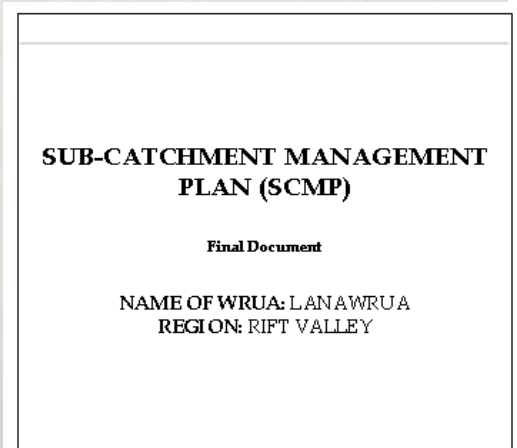
Sustainable Development Action Plan (SDAP) 2012—2017

The development and publication of the SDAPlan been facilitated by the following partners;

ASDA TESCO Sainsbury's

H3(ii) framework – 2010 - 2015

- Water Act 2002, Gazetted 2005, Operational 2009
- Water Resources Management Agency (WRMA)
- WAP
- SCMPs


SUB-CATCHMENT MANAGEMENT PLAN (SCMP)

Final Document

NAME OF WRUA: LANAWRUA
REGION: RIFT VALLEY


Water Resources Management Authority

NAIVASHA BASIN WATER ALLOCATION PLAN

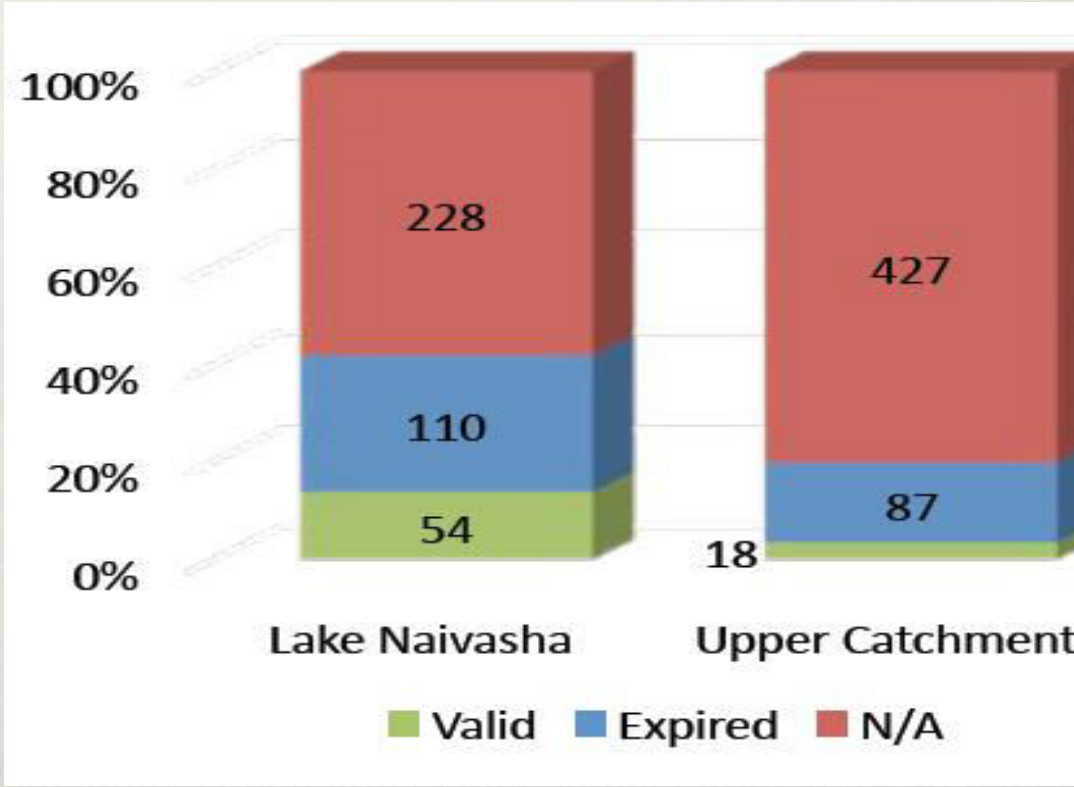
2010 - 2012

Republic of Kenya

December, 2010

H3(ii) integration – 2010 - 2015

- Water Abstraction Survey, LaNaWRUA
- IWRAP (Integrated Water Resources Action Plan) 20013-18
- WWF-Dutch Government
- Support WRMA to execute its duties

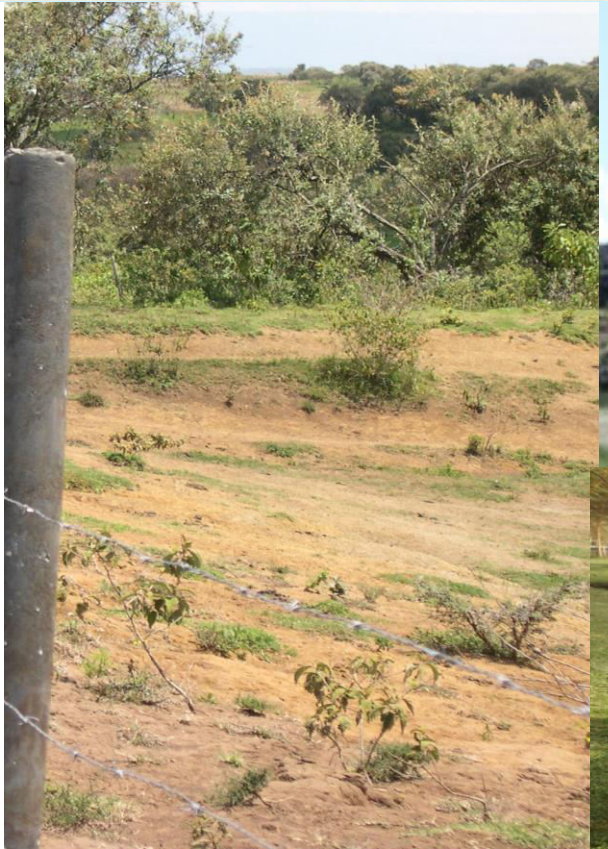


H3(ii) drawbacks– 2010 - 2015

- Politics – Imarisha in OPM from 2008, moved to MoE 2013 but only gazetted March 2015 -2.5 years in limbo
- Corruption, self-interest, racism
- Poor levels of education
- Poverty, hence no spare time

H3(ii) Leicester– 2012 - 2015

- Independently funded from Swiss Coop, German REWE Group
- ‘Demonstration sites’ of sustainable use
- ‘Demonstration methods’ of riparian restoration, lake and now rivers.
- ‘Citizen Science’ for lake health monitoring



H3(ii) future – 2016 - 2021

- Imarisha stability of funding
- Water charge inadequate – ‘Fair trade’ style levy at PoS?
- Direct voluntary water levy
- Bed-night levy
- Out-of-basin users?

Water Resour Manage (2012) 26:3725–3742
DOI 10.1007/s11269-012-0099-9

Mitigating the Water Footprint of Export Cut Flowers from the Lake Naivasha Basin, Kenya

M. M. Mekonnen · A. Y. Hoekstra · R. Becht

THE VALUE OF WATER – AN ECONOMIC BASIS AND MECHANISM TO ASSESS HIGHER WATER CHARGES, ABSTRACTION RESTRICTIONS AND A PROPOSED “LAKE NAIVASHA BASIN SUSTAINABLE DEVELOPMENT FUND” **APRIL 2015**

Philip M Cook. Fortuna Ventures Inc., Connecticut USA
Bryce A Contor. Mirab Water, Idaho USA
David M Harper. University of Leicester
Bart Vereecke. McKinsey and Co. Belgium


Thank you
Asante sana