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Water Productivity Improvement in Practice

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AIAP, THE WATERPIP SERVICE CENTER FOR KENYA: PROGRESS AND WAPOR PRODUCTS

Presentation at the WAPOR-II Workshop

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At: **IHE-Delft, The Netherlands**

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ASSOCIATION OF IRRIGATION ACCELERATION PLATFORM

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Kenya's food security facts

Small-scale farmer incomes

~8 million

Kenyan's earn income from farming, even if only ~350,000 formal jobs exist in the sector

~60%

of production including 60-70% of all maize production. But only 10-15% of incomes for these farmers come from maize

<7%

of land is irrigated, most arable land is rain fed[4]

2nd

largest livestock herd in Africa, 13th largest number of dairy cows in world, but 138th yields due in part to cold chain storage

Agricultural output and value add

~25-30%

of total GDP, ~70-80% from crops, 13-20% from livestock, <2% fish and aquaculture, and % others[1]

~2.3%

of national budget[2] (~KES 60bn) of which ~KES 5bn spent on subsidies (equivalent to ~13% of MOAI budget)

KES 100bn

Opportunity for Kenya to capture from closing yield gaps in maize, beans and tea to best in class regional peers[7]

1/8

value add per agricultural worker compared to SSA peers[8]. Kenya at KES ~80k, peers at KES 350-750k

Household food resiliency

1.5 million

Chronically food insecure Kenyans in ASALs, primary due to drought. Increases to ~3.7mn Kenyan's during severe droughts

2x

more price volatility than rest of EAC peers[3] including Uganda, Tanzania, Rwanda, Burundi for key staples

6 of 7

water catchment areas under severe stress by 2030

90%

of all fish caught in Kenyan waters is left for domestic consumption, a significant opportunity to increase and protein nutrition

Source: ASTGS, 2019

Achieving 100% food security as part of Kenya's Big Four agenda requires a transformation of the whole agriculture sector

"FARMER" IMPLIES SMALL-HOLDER, PASTORALIST, FISH

Pillar	How transformation can support a path[1] to 100% food security
Increase small scale farmer incomes 	▪ **Double harvests** from better feeds, irrigation and fertilizer[2] for local consumption ▪ **Raise ~5mn Kenyans out of poverty** (~1.3mn households[3]) by shifting farmers from subsistence to **market-oriented output**
Increase agricultural output and value add 	▪ **Double contribution of agro-processing to GDP** (~KES 200bn increase) and **create markets for small and large scale commercial farmers** ▪ **Grow an additional ~0.5mn tonnes of maize[3]** from private farms operating state owned land[4]
Increase household resiliency 	▪ Streamline national Strategic Food Reserve (SFR) operations to **better serve ~4m vulnerable Kenyans during emergencies** ▪ Employ cost-effective methods (e.g., cash transfers) **to stabilize prices year-round** ▪ Bolster resilience of households in ASAL regions (e.g., drought resistant crops) to ensure that **food is available to Kenya's ~1.5mn chronically food insecure populations**

Source: ASTGS, 2019

Characterization of Kenya's Irrigation by Scheme Sizes

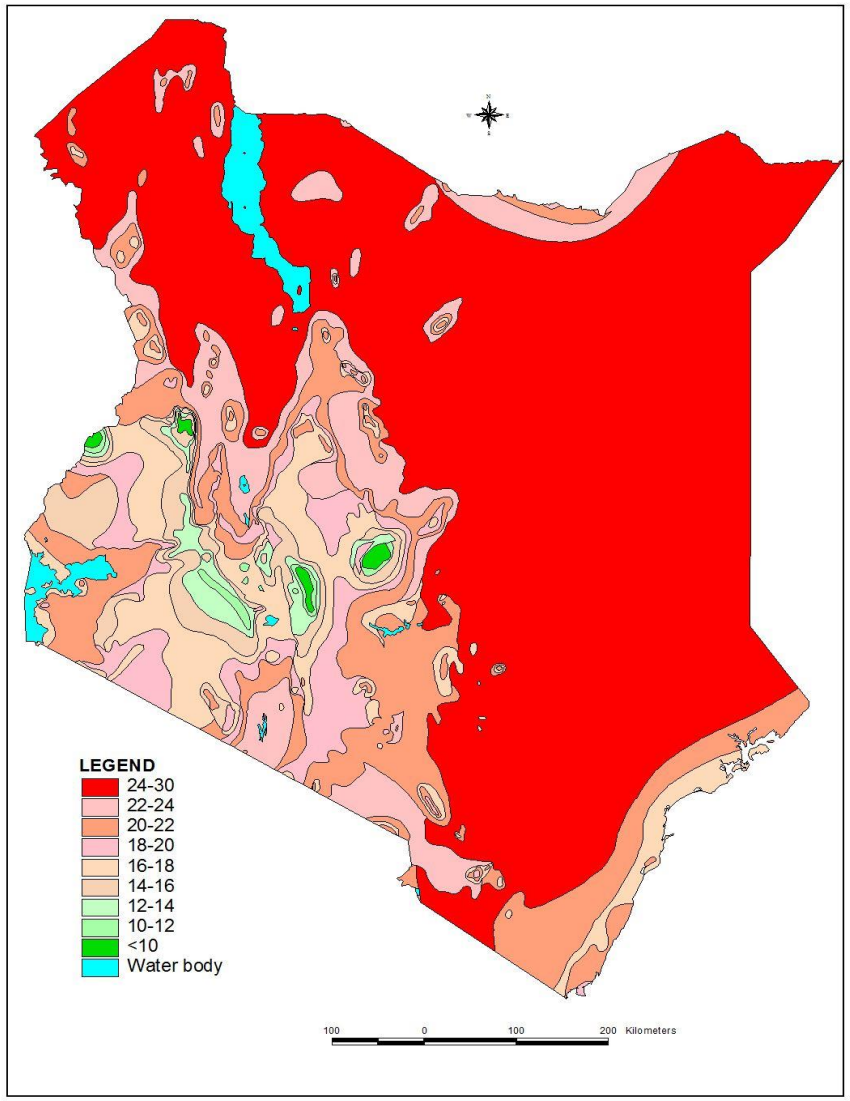
Category of Irrigation	Holding size (ha)	Irrigated Area (ha)	Percentage of total
Public and national schemes	40 - 12,000	22,028	10.9%
Community-based schemes	<40	99,964	49.5%
Private commercial farms		79,970	39.6%
Total Irrigated area		201,962	100%
Total irrigation potential & percentage of total land irrigated	All	1,342,000	15.0%

Data source: Irrigation Guidelines (2020)

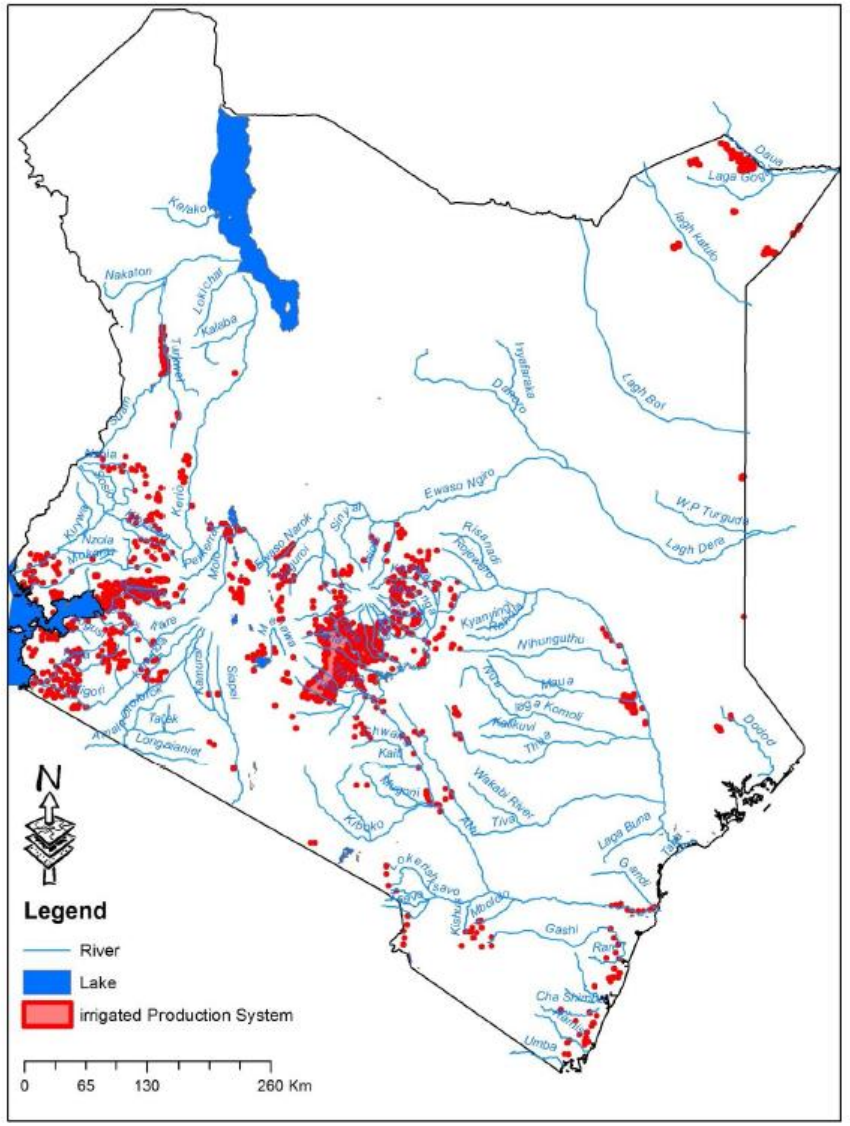
Note

- *The extent of individual irrigated farms (FLID) is largely unknown, i.e. not included national databases*
- *The Irrigation Potential (1,342,000 ha) is underestimated. It does not include areas that could be irrigated using water harvesting*

Water Management Challenges facing Kenya's Agricultural Lands



Extent of drylands in Kenya



Irrigated areas in Kenya

Examples of Categories of Irrigation Schemes in Kenya

AIAP AS WATERPIP SERVICE CENTER FOR KENYA

1. **Market Analysis**

(i) Country wide inventory of clientele and opportunities to deploy WaPOR data;

(ii) Stakeholder engagement to establish specific needs and demands;

(iii) Mapping of potential geographical locations for services;

(iv) Translation of opportunities, needs and demands into potential services (i.e.. determination relevance, format, and means to provide services;

2. Service Center Business Plan

(i) Valuation of services and competitive comparison analysis

(ii) Strategy (business objectives, requirements and funding strategy, strategic alliances) and financial plan

(iii) Management, proposed setup and planning

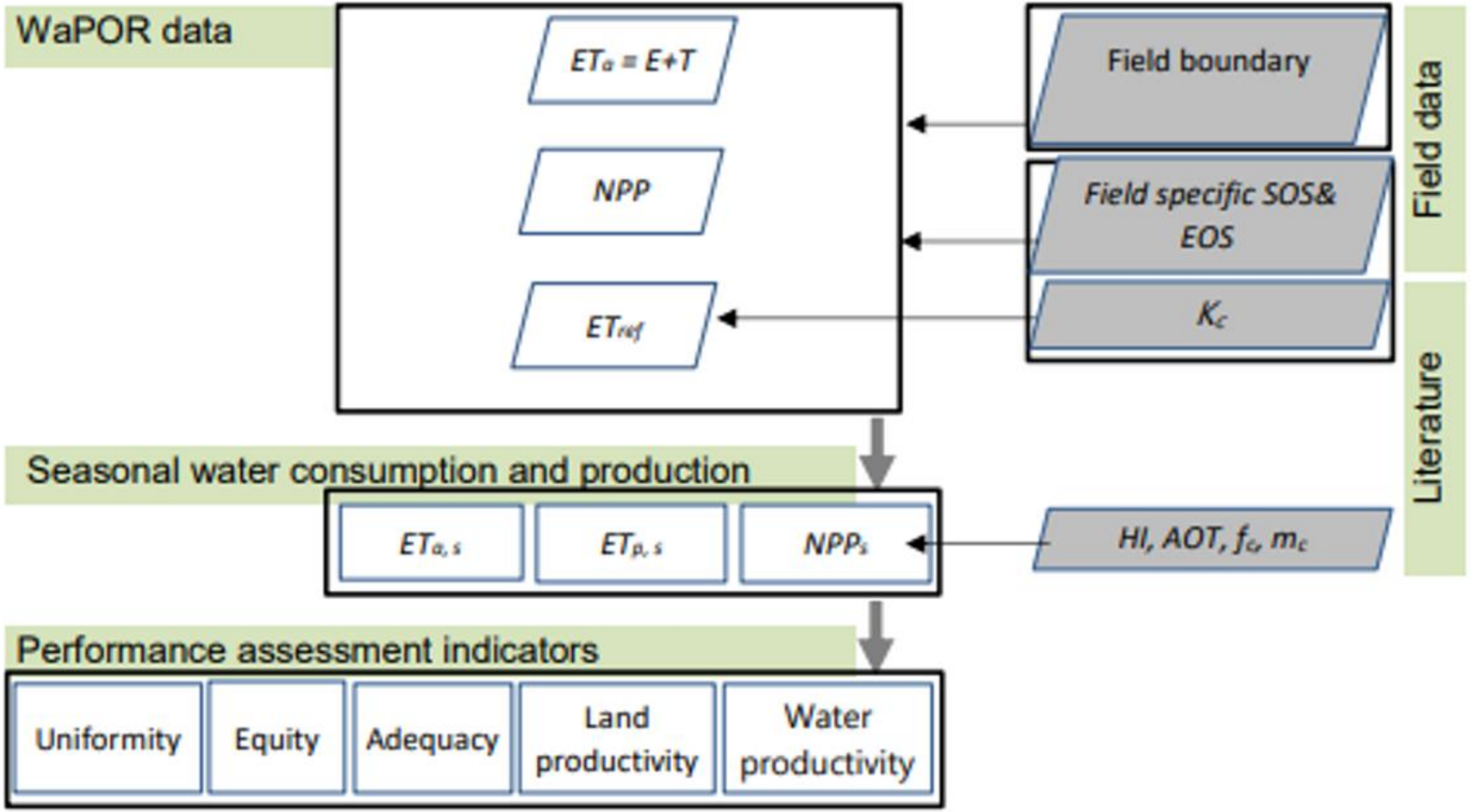
3. **Evidence of at least 5 services provided**

- Clear reason and rational for the service (what is the service addressing)
- A description of the service (methodology and tools used and outputs delivered)
- A clearly described user experience, i.e. how has the service been of (added) value to the centers.

4. Event reports -Hold held at least 3 events to promote WaPOR and associated service

- Aim and purpose of the event
- Materials that have been developed for promotion and organising of the event
- Attendance lists
- Discussions and outcomes (leads for the center and reflections from stakeholders)

Schematic representation of WaPOR based Irrigation performance assessment framework



Criterial for Selection of Target Sites/Clients for WAPOR

WAPOR products are being developed for 8 candidate sites in Kenya (to achieve at least 5 Clients).

The criteria used in the selection of these sites included:

- Areas with a specific crop enterprise under irrigation – get single signature
- The irrigation scheme/ crop covers relatively large contiguous area
- The presence of a single institution that can be approached as a client
- The opportunity to leverage data on WP using Remotely sensed data
- Lack of/poor databases on WP in the selected site (hence possible need for WAPOR Products)

Target Sites/Clients Selected for WAPOR Products (8 sites)

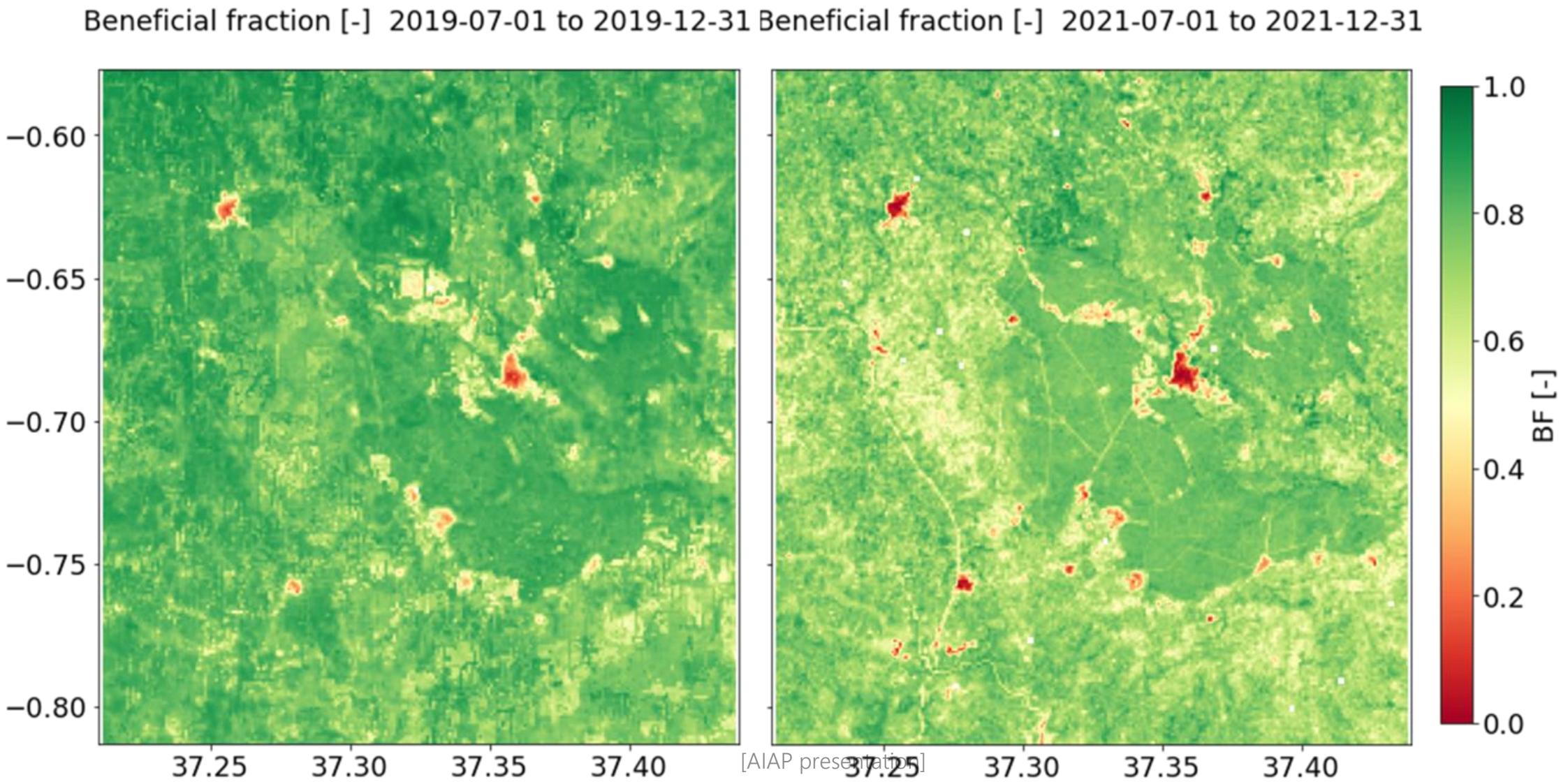
***Five (5) Sites have already been done (*Simulation of WAPOR model)**

1) Mwea Irrigation Scheme (Rice)
2) Kwale County, Ramisi/KISCOL area (Sugar)
3) Ahero Irrigation Scheme (Rice)
4) West Kano Irrigation Scheme (Rice)
5) Perkerra Irrigation Scheme (Seed maize)

The *three (3) being worked on now are*:

6) Kibirichia area of Meru County (potatoes/peas/cabbage)
7) Kabaa Irrigation scheme in Machakos County (French beans)
8) Kibwezi area, Makueni County (Sisal plantation)

Mwea Irrigation Scheme, Kirinyaga County (Rice) - *WAPOR products*



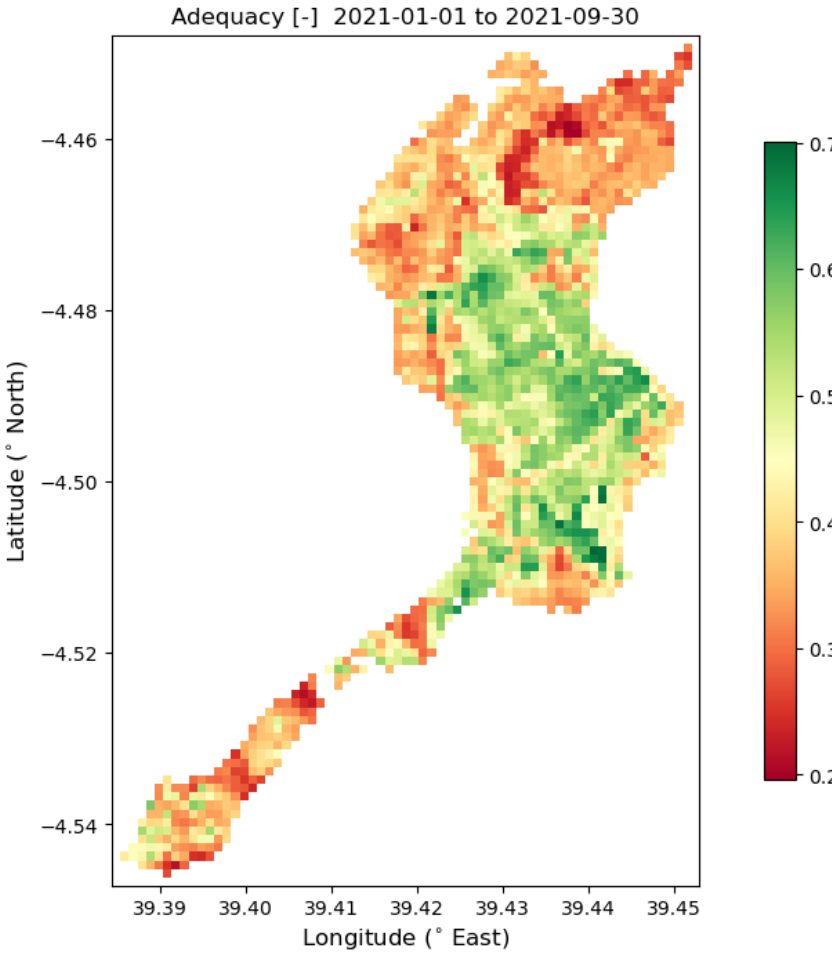
[AIAP presentation]

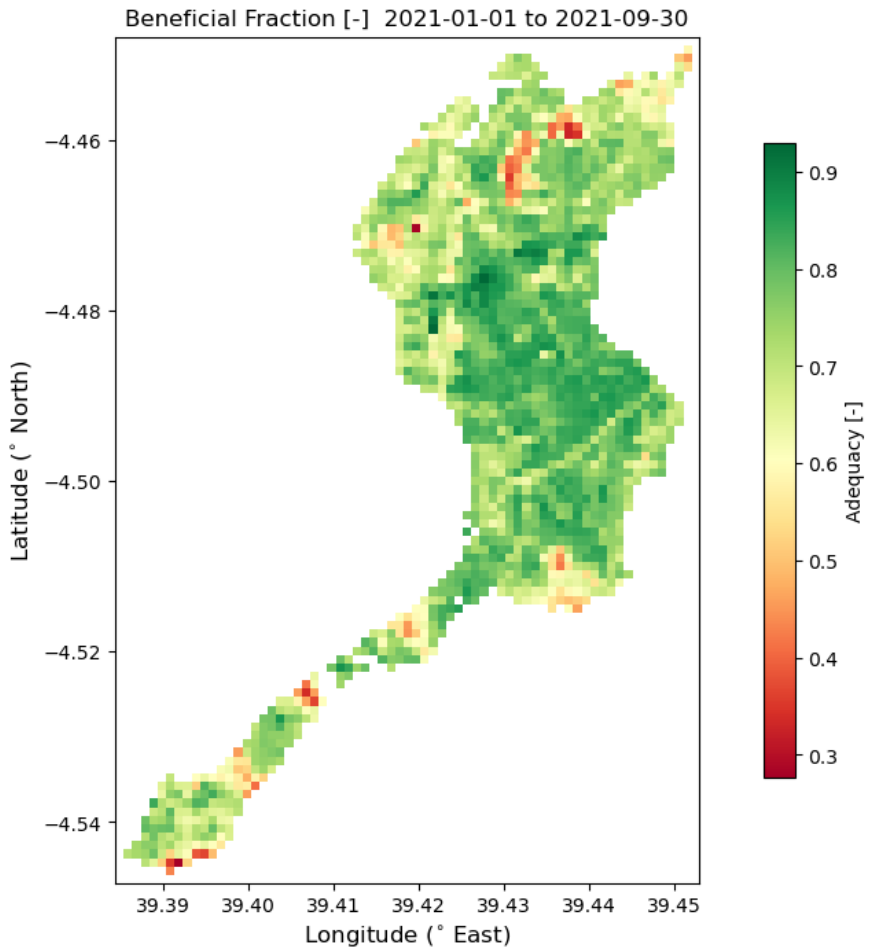
KISCOL, Kwale County (Irrigated sugar)

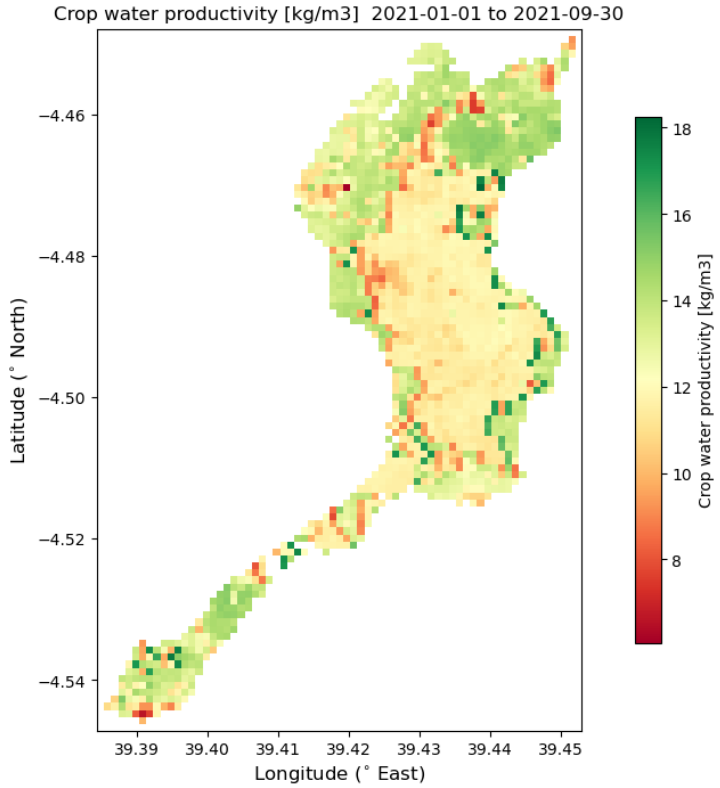
Irrigated Sugarcane at Ramisi, Kwale County

[AIAP presentation]

KISCOL, Kwale County (Irrigated sugar) - *WAPOR Products*

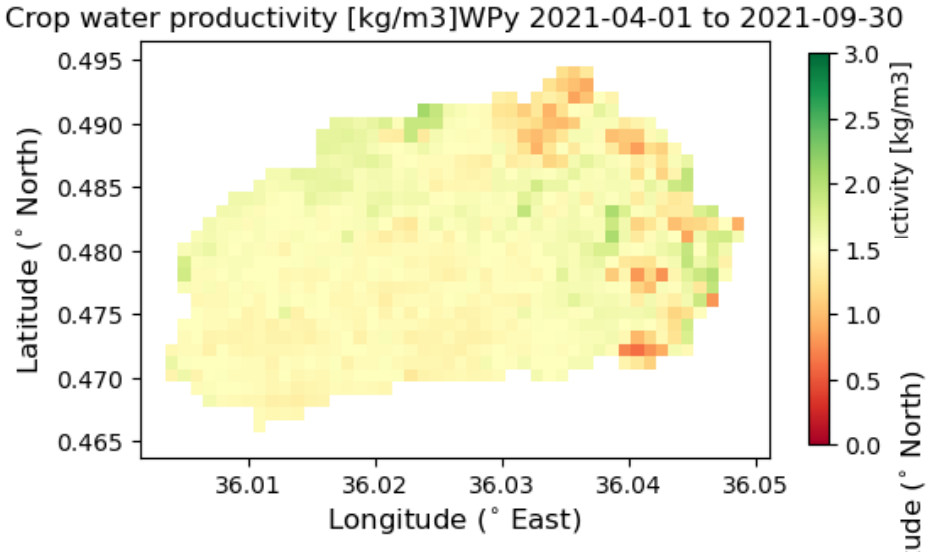


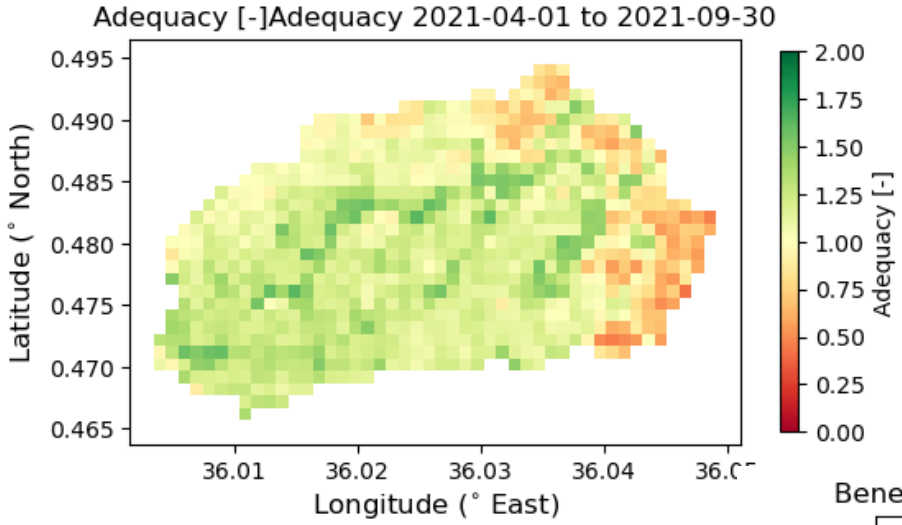


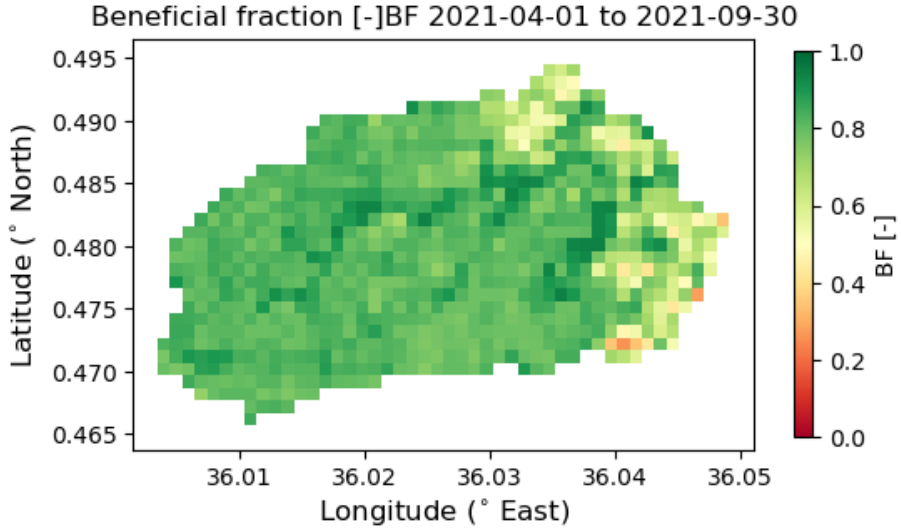


Perkerra Irrigation Scheme, Baringo County (Maize)

Perkerra Irrigation Scheme, Baringo County (Maize) – *WaPOR Products*

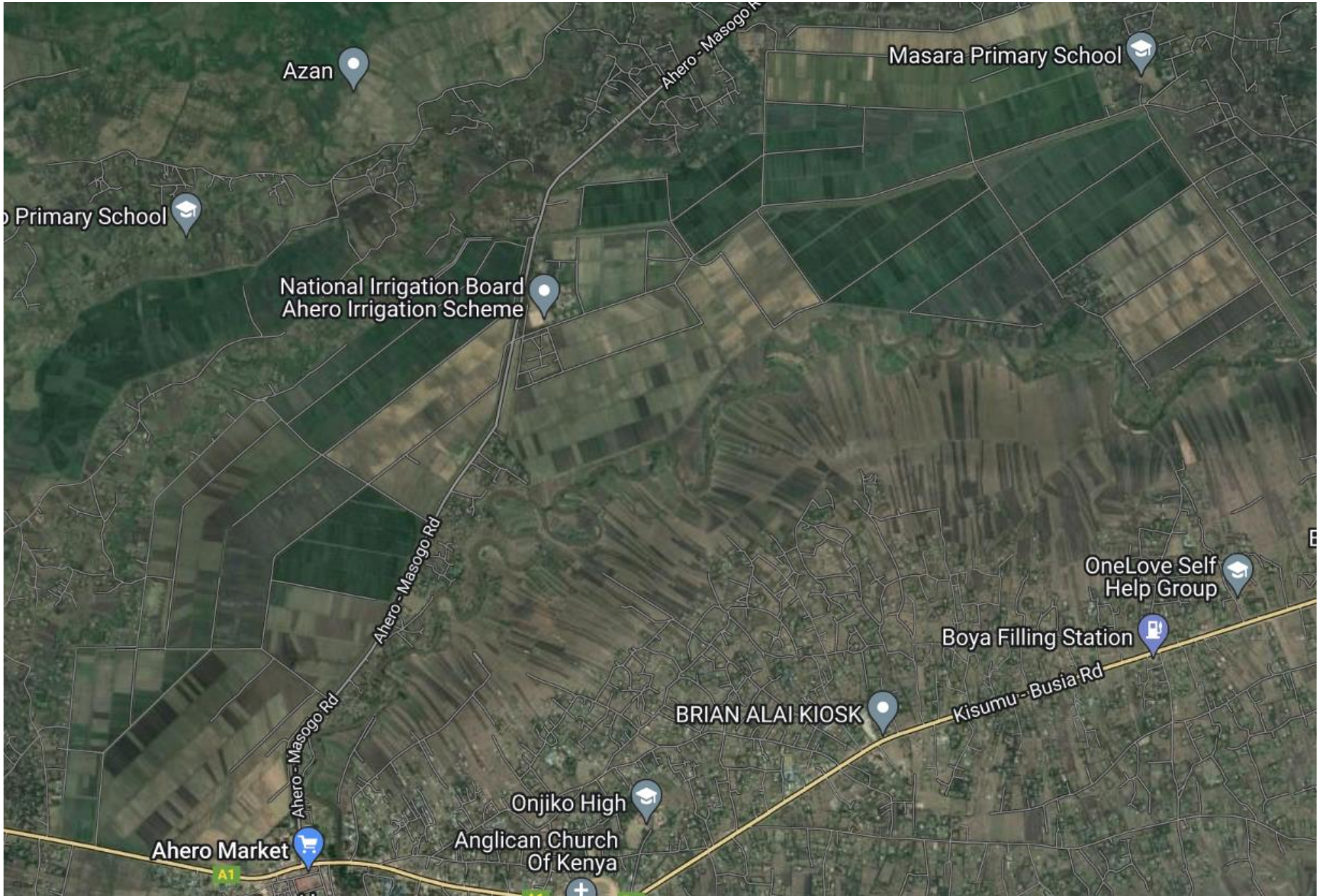




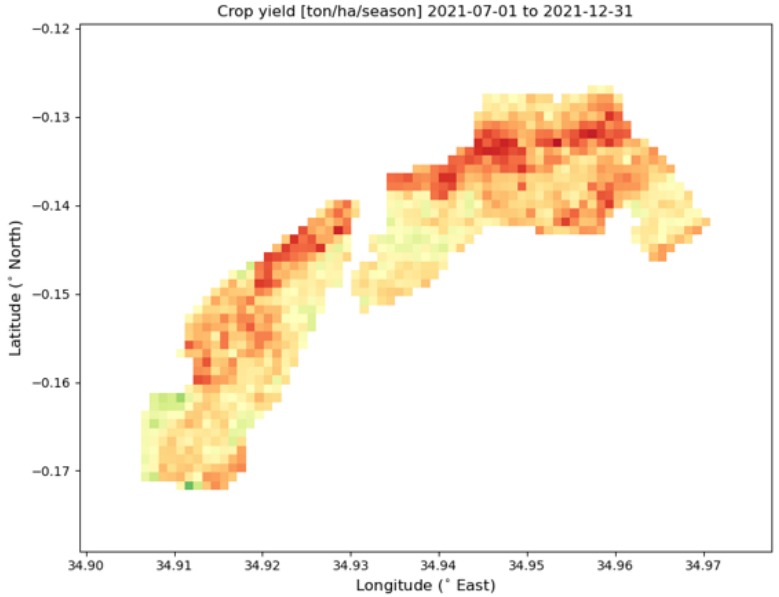


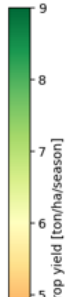
[AIAPpresentation]

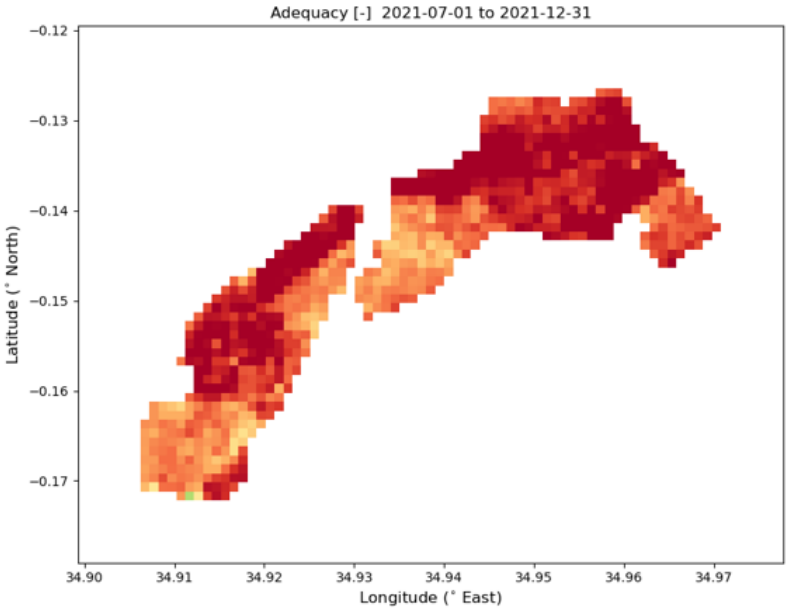
Ahero Irrigation Schemes, Kisumu County (Rice, IR Variety)

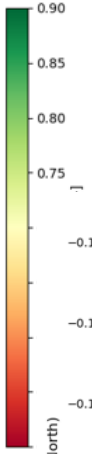


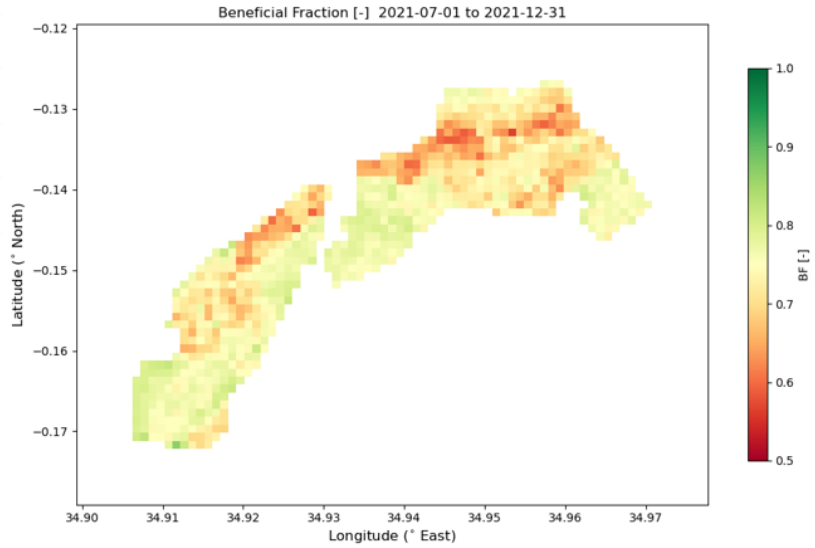
Ahero Irrigation Schemes, Kisumu County (Rice) –*WaPOR Products*



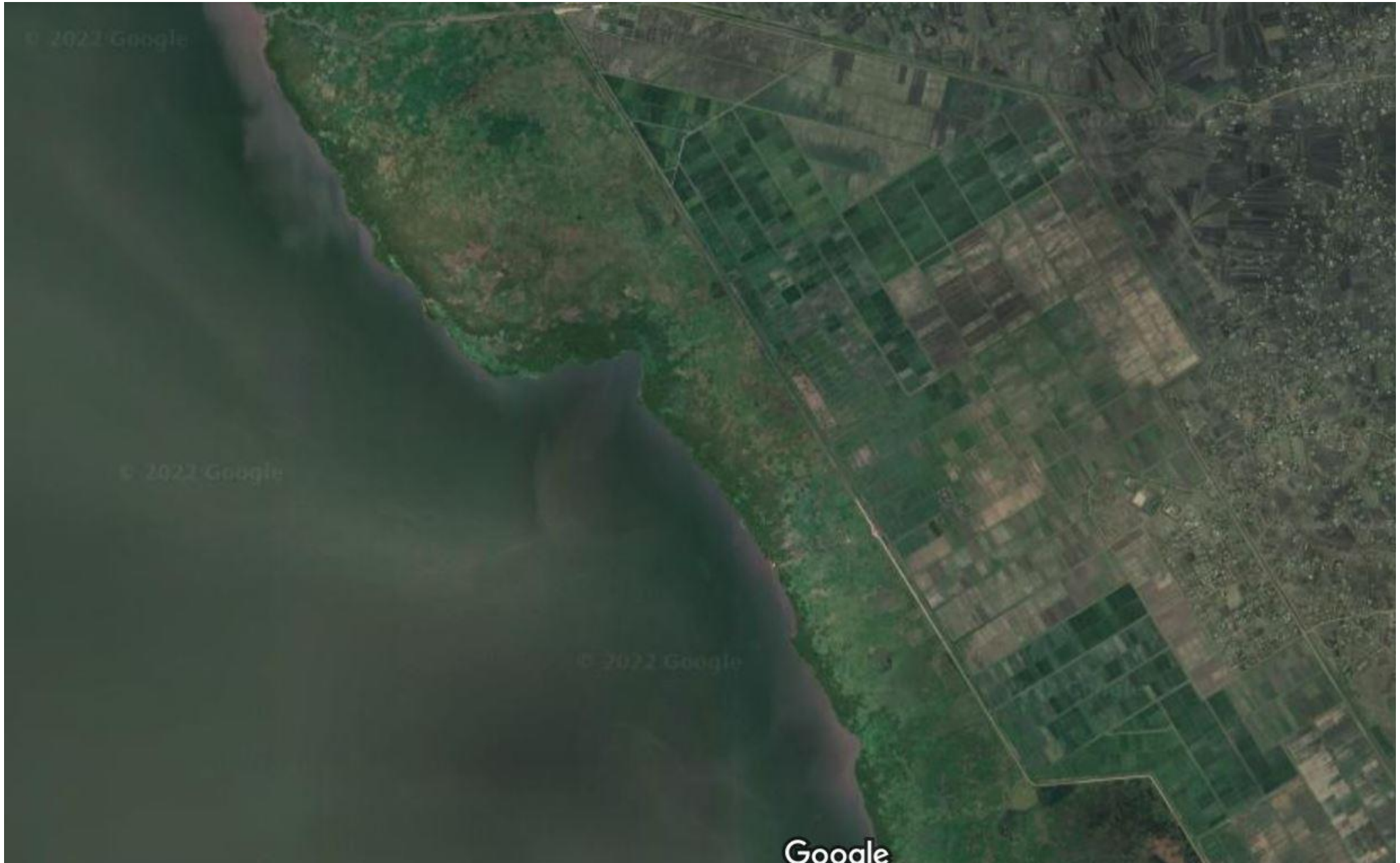




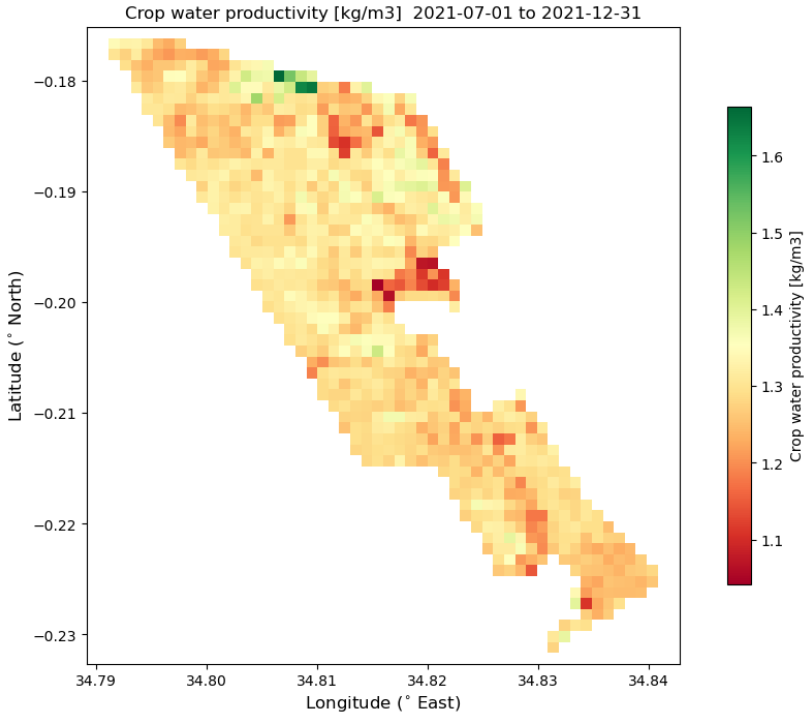


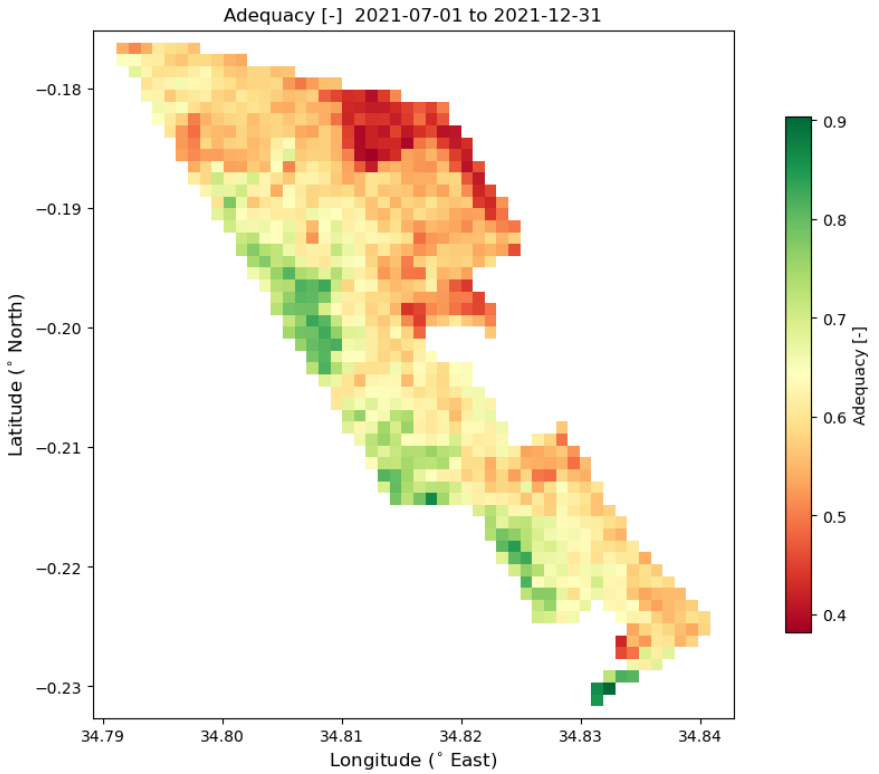


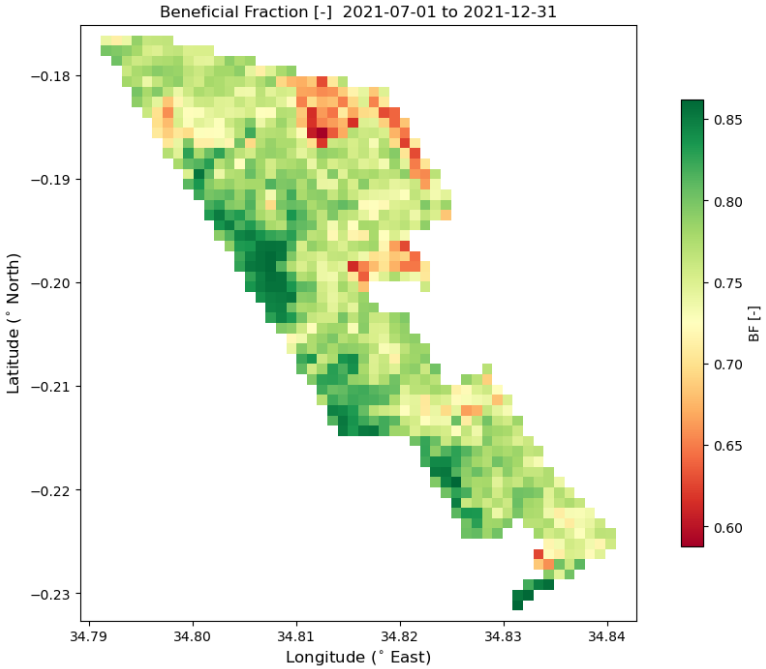
West Kano Irrigation Schemes, Kisumu County (Rice)



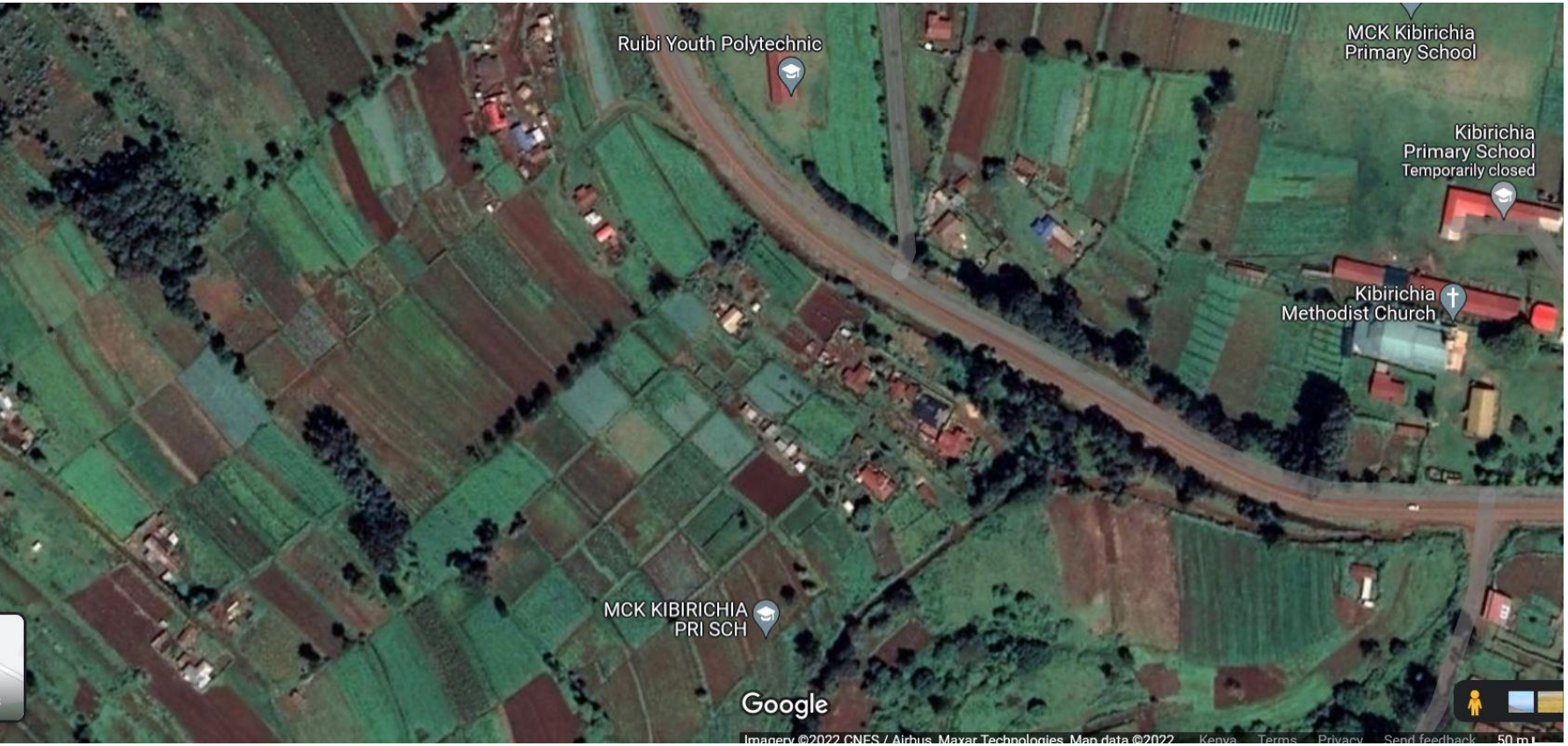
West Kano Irrigation Schemes, Kisumu County (Rice) - *WAPOR Products*







Kibiricha, Meru County (potatoes, peas)



[AIAP presentation]

Kibwezi sub-county, Makueni County (Sisal plantation)

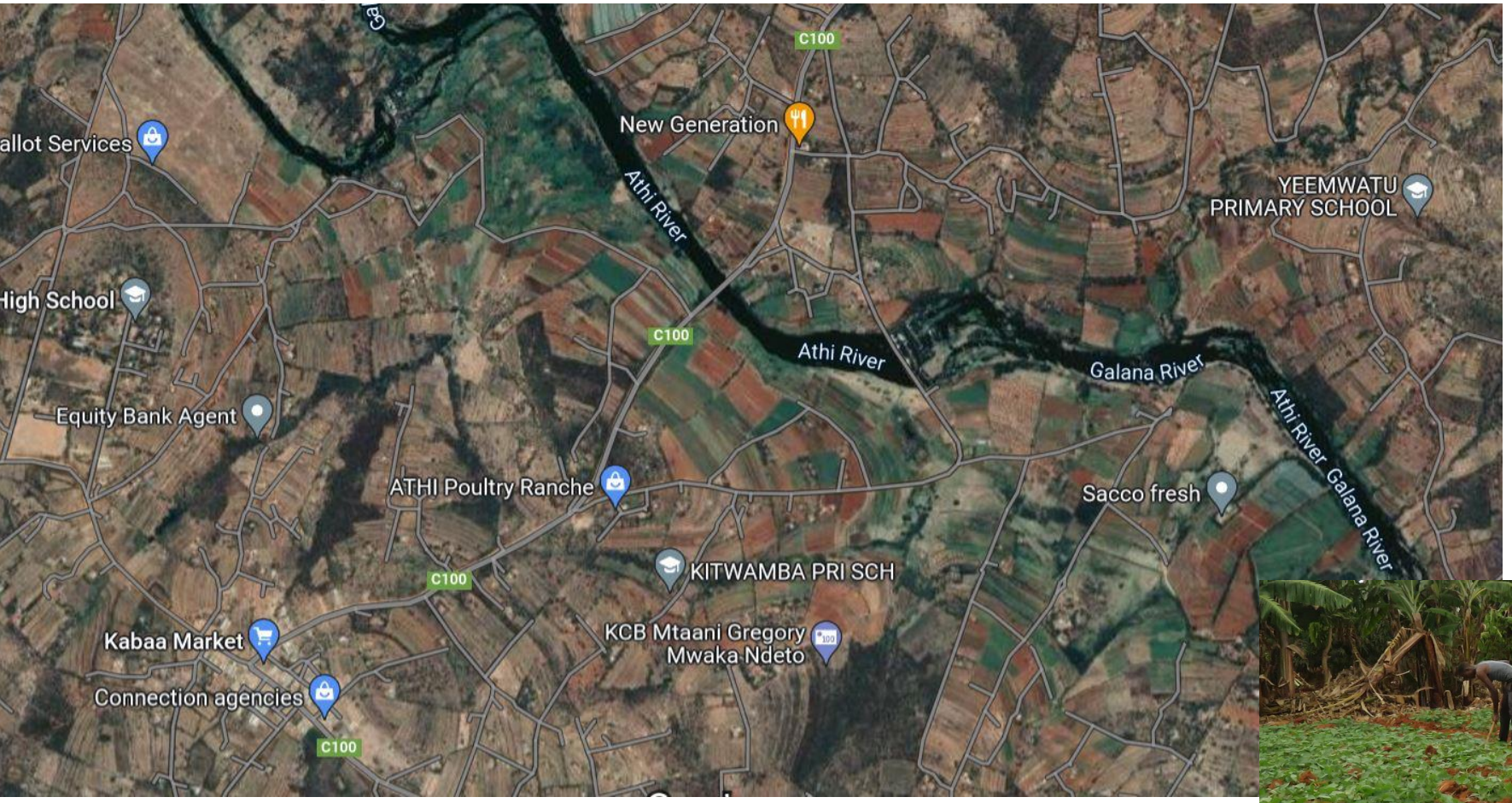
Why this site

Sisal is a hardy fibre crop which survives the worst drought and does well on poor soils – but not grown much

- Opportunity is in use of WAPOR data to determine sisal WP as an alternative rainfed cash crop with Climate smart & environmental benefits (instead of plastics)

[AIAP presentation]

Kabaa Irrigation Scheme, Machakos County (French beans)

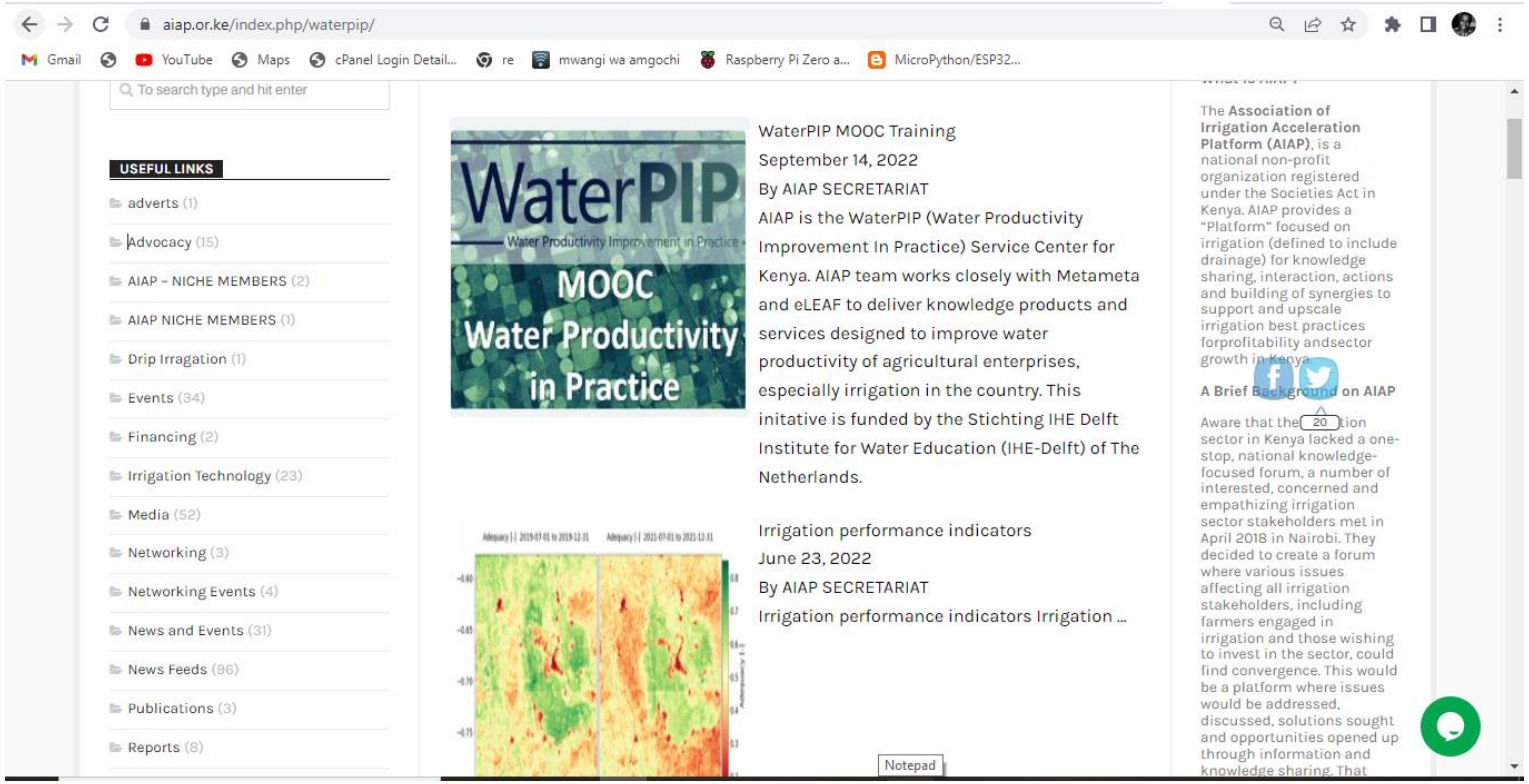


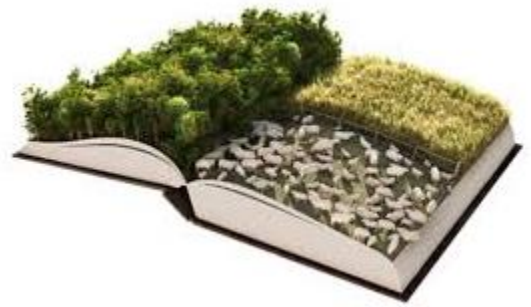
Irrigated French beans

[AIAP presentation]

Creation of Water PIP portal on AIAP website

- The portal is updated with various processed WAPOR map data which is available to the public
- The portal also advertises the Kenyan WAPOR products.





Challenges Faced

1) Low Resolution of WAPOR data (100 m Resolution) – *Selected areas of large scale irrigation*
2) Mixed crop types and planting dates increasing noise in data
3) Translation of WP into yield- difficult for fruits e.g. citrus, banana
4) Could WAPOR data be useful for rainfed crops/
5) Would National Irrigation Authority or farmers really buy WAPOR data?
6) Identification of “customers” for WAPOR data
   - Private sector is too advanced and unlikely to be interested.
   - Public sector institutions hold possibility as they do not assess WP in most irrigated areas in Kenya.

Next Actions

1) Reach out to Kenyan Business community and policy makers, including Water User Groups/ regulators t sensitize on WP
2) Build Capacity within AIAP to handle larger and more precise data processing capabilities to meet expected demand
3) Develop targeted products for niche crops with special focus on irrigated crops (Vegetables) and Rainfed (e.g. Sisal, Moringa oleifera- drought resistant yet environmentally friendly crops)
4) Develop user demand for WP data for decision making at farm level and cascaded to Policy level
5) Build a Community of Practice for upscaling WP in irrigation in Kenya through AIAP's network
6) Reach out to neighboring countries, e.g. Uganda to start a WaterPIP Service Center and upscale WP through outreach
7) Create a demand-driven value chain for WP data

THANK YOU!

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www.aiap.or.ke