

# ICT Innovations for Fisheries Management and Coastal Planning

**Brian Crawford, Ph.D.**

**Chief of Party**

**USAID/Ghana Sustainable Fisheries Management Project  
Coastal Resources Center, Graduate School of Oceanography  
University of Rhode Island**

**Brian@crc.uri.edu**

# Many Promising Hooks in the Water

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- Small Unmanned Aircraft (SUAs) for coastal planning and disaster management
- Fuel-efficient, low PAH fish smokers
- Paperless surveying methodologies using tablets and cell phones
- Mobile micro-insurance partnership with Millennium, UT Life and Vodafone
- Tigo Fishers Network phone club with an Illegal fishing reporting hotline

# INNOVATION: SUAs for coastal planning and disaster management



**Increasing severity and frequency of coastal flooding due to sea level rise.**



**Increased risk of loss of coastal property and lives.**



**Fisheries is water dependent so typically communities are in harms way.**

## Small unmanned aircraft (SUA)



Quadcopter cost - \$2,000  
Small range 1- 4 sq km  
No special sensors



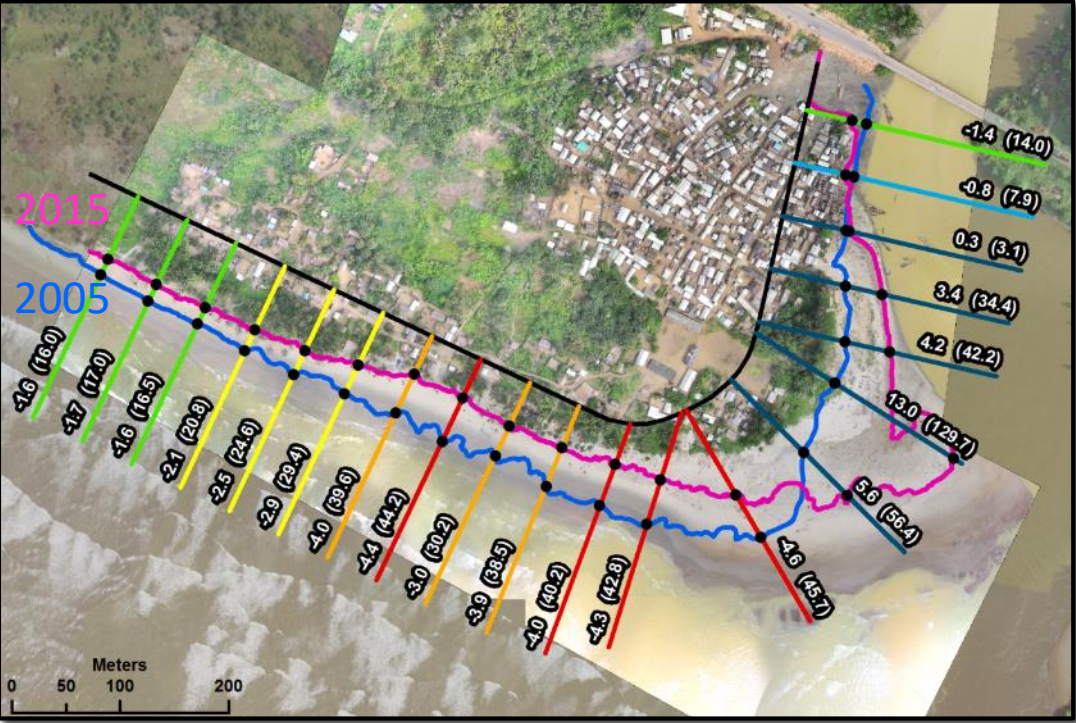
Fixed wing cost \$50,000  
Larger range 50 – 100 sq km  
More sensors

# WHY SUA?

- High resolution imagery
- Lower cost than satellite data
- Goes under the clouds – no clouded scenes
- Faster image acquisition
  - e.g. for storm damage assessment – days
- High demand for uses; coastal and others
  - Damage assessments
  - Vulnerability assessments
  - Land use changes and classification
  - Habitat mapping and environmental monitoring
  - Street naming
- Town and Country Planning Department a main client
- Scale up applications well beyond coastal and fisheries



# Shore erosion rate estimates and development setback calculations



Elevation mapping and forecasting future flood hazards

# Ecological Monitoring

- Calculating deforestation rates
- Monitoring of regulated cutting
- Identification of replanting sites



- 38.1 Ha Healthy
- 3 Ha Dead, Dying, Cut

# Local Capacity Building is Essential

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## Training of UCC and NGO SUA technicians

- GCAA permitting requirements
- Pilot training
- Data and image analysis
- GIS applications and products

## Sustainability plan

- Demand for services and clients identified
- Maintenance and replacement costs
- Cost recovery and pricing plan for services



# INNOVATION: fuel-efficient, low PAH fish smokers

- 30,000 – 40,000 traditional “Chokor” fish smokers along the southern coast and Volta Lake
- Most pelagic fish is smoked and dried on these smokers
- Almost all are small-scale women-owned businesses
- High fuel usage - mangroves and other forest wood
- Environmental health issues from smoky work areas
- High PAH (carcinogen) levels





# The evolution of fish smoking technology



A Chorkor Stove in use. The same basic design is now used throughout West Africa.



A double-unit Ahotor stove, offering lower-PAH levels, improved energy efficiency, less smoke, better product, higher initial cost.

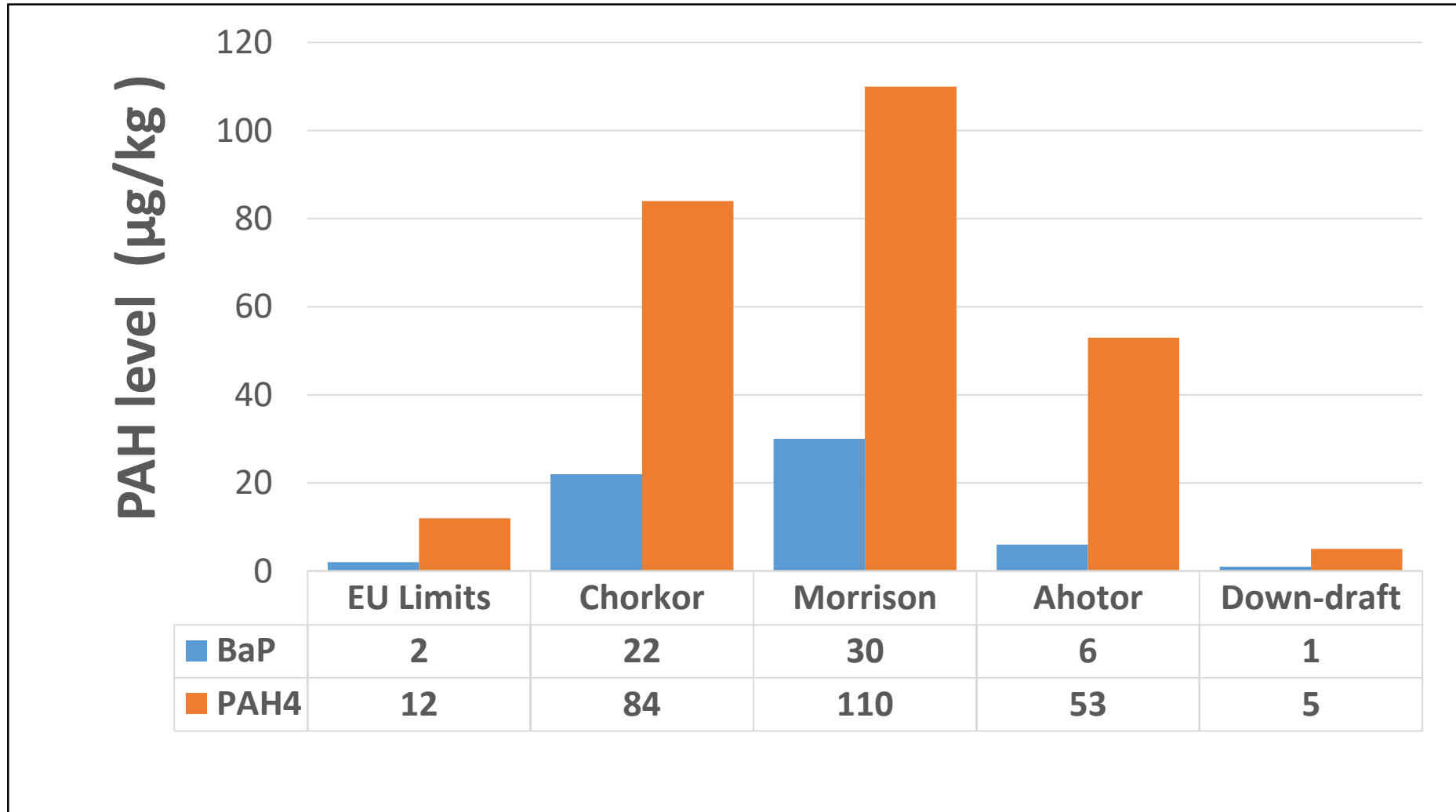


The improved Morrison stove adds a number of energy efficient features, less smoke, better product, but high PAH.



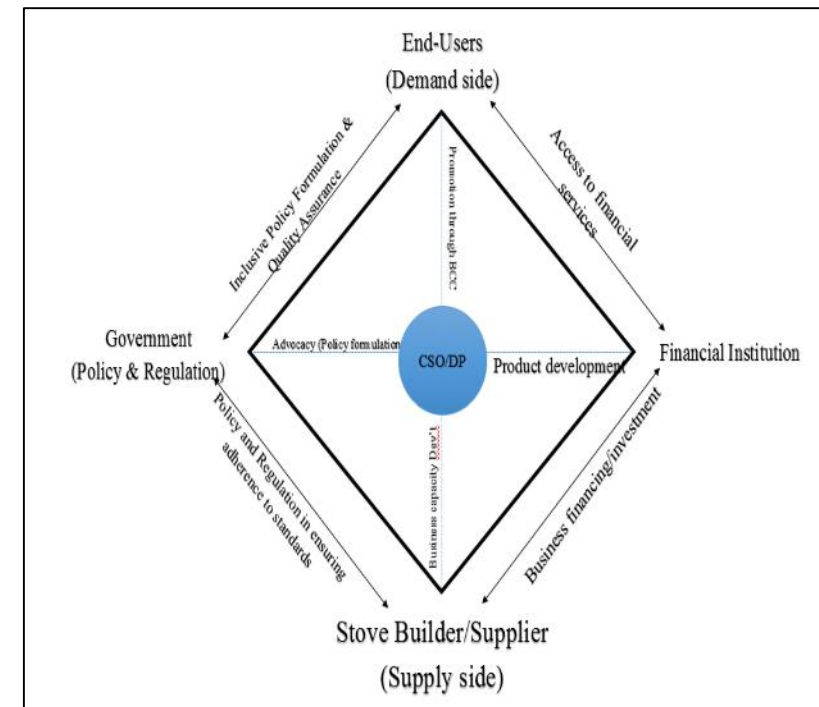
Downdraft stove, offering very low PAH levels, improved energy efficiency, less smoke, better product, higher initial cost, design not as similar as chokor.

# Comparison of PAH levels in various fish smoker designs



# Private sector led scale-up strategy

- Development of SNV certified builders and a supply chain with customizations to regional needs
- NGOs and processor associations with demonstration smoker ovens and sheds
- Negotiations with GN Bank and others for a lending program for the improved fish smokers
- Organizing women processors and provision of business training



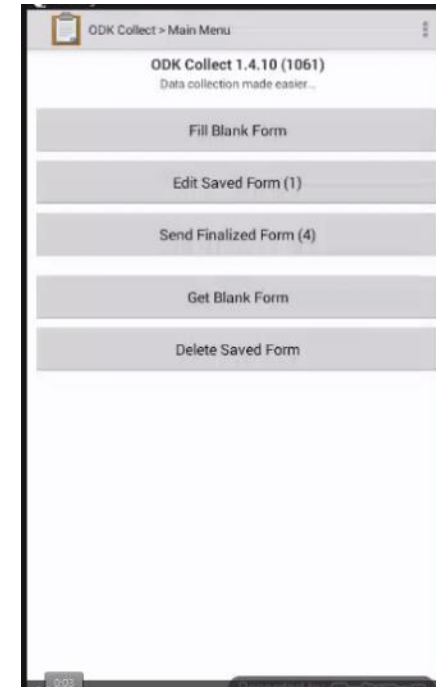
# Scale up Challenges

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- Processors love it! Product looks and tastes great! But.....
- High initial cost of the improved stoves even if return on investment is only 6 months and profitability is high
- Delayed take off in Year 2 due to problems of Morrison design
- 200 *Ahotors* in 2017, take-off for auto diffusion at 6,000 by 2019?
- Need to seal the deal with financing institutions as finance is a main constraint to acquisition by processors

# Paperless Data Collection: household surveys and fish landings

Household Demographics		
<b>NOTE TO ENUMERATOR:</b> ALL APPLICABLE QUESTIONNAIRE SECTIONS SHOULD BE ASKED OF THE HEAD OF HOUSEHOLD AND SENIOR HOUSEHOLD MEMBER AS SEPARATE SURVEY ENTRIES		
B 1.01 IS THE RESPONDENT THE HEAD OF HOUSEHOLD, OR THE GENDER-OPPOSITE SENIORMOST* HOUSEHOLD MEMBER?  <input type="radio"/> Head of Household <input type="radio"/> Gender-Opposite Seniorsmost Member	Required	B 1.02 WHAT IS THE RESPONDENT'S GENDER?  <input type="radio"/> Male <input type="radio"/> Female
B 1.03 WHAT IS THE RESPONDENT'S AGE IN YEARS?	B 1.04 WHAT IS THE RESPONDENT'S CIVIL OR MARITAL STATUS?  <input type="radio"/> Never married / Single <input type="radio"/> Informal / Consensual union / living together <input type="radio"/> Married <input type="radio"/> Separated <input type="radio"/> Divorced <input type="radio"/> Widowed	B 1.05 CAN THE RESPONDENT READ AND WRITE IN EITHER ENGLISH, THE LOCAL LANGUAGE, OR BOTH?  <input type="radio"/> Yes <input type="radio"/> No



- No transcription errors
- Data coding is automated and standardized outputs can be programmed

# Micro-Insurance Private Sector Partnership

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- Millennium Insurance, UT Life, BIMA, Vodafone partnership
- Payments as low as 1 GHS per day
- Payout during a closed fishing season
- Term-plus policy so acts as a quasi savings and retirement scheme
- 5 year term to maturity
- Premiums and payouts via a mobile money platform - Vodafone cash
- Plan approved by the National Insurance Commission - Feb 2017
- Sales to start in April 2017

# Tigo Fishers Network

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- In-network calls for free – estimated savings to users at 5 -50 GHS/month
- Promotes digital financial literacy in fishing communities
- Secure mobile money platform as fisheries has high daily transaction volumes
- Toll free hotline for reporting illegal fishing activities to Fisheries
- Marine weather forecasts
- Sending information from the Fisheries Commission to network members
  - e.g. A new fishing regulation such as a seasonal closure, fish processing, fish farming tips...
- May have fish pricing information and other features added at a later date