EACP Committee

From: Shay Chan Hodges <shay.chanhodges@gmail.com>
Sent: Tuesday, August 11, 2020 12:00 PM
To: EACP Committee
Cc: Kasie M. Takayama; Ian Chan Hodges; Gina M. Flammer
Subject: PowerPoint Presentation for WATER DELIVERY SYSTEMS (EACP-51)
Attachments: NewCountyPresentation08062020-29p sm.pdf

Aloha EACP Committee Members:

As you know, we have submitted the following report for your review.

1. "STRATEGIC ASSESSMENT, ROADMAP & RECOMMENDATIONS FOR EAST-MAUI WATER-LAND ECOSYSTEM & WATERSHED."

For today's meeting, we've compiled excerpts from that report plus added a few additional slides for context.

I've attached the presentation here:

1.

We are looking forward to the presentation!

—shay

Shay Chan Hodges
_____
Responsible Markets
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ON JAN 31 & FEB 1, 2020, THE MAUI ESG PROJECT PRESENTED THE AHUPUA`A INVESTMENT SUMMIT AT THE UNIVERSITY OF HAWAII MAUI COLLEGE

The 2019-2020 Maui ESG Project and Ahupua`a Investment Summit were funded through a Maui County Office of Economic Development grant and local and national matching funds.

Ahupua`a Investment Summit Goals:

- **Increased community** understanding of ESG, institutional investment, & private equity
- **Preliminary understanding by ESG practitioners** of local issues and needs, and Maui's potential to be a model for community-driven ESG investment
- **Relationship building** between community members, policy makers, & ESG practitioners

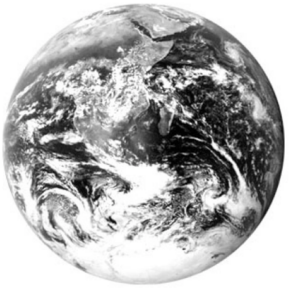
Responsible Markets is grateful to everyone who participated in and supported the two-day summit and working groups. These efforts laid the groundwork for this report and other initiatives.

On February 1, 2020, the Ahupua`a Summit presented the Water Governance & Finance Working Group Panel:

Panelists, who were working group members, discussed community-controlled water systems, including models for impact financing, governance structures, and transparent stakeholder driven accountability models. Prior to the Summit, Eric Glass of Alliance Bernstein, Phil Glynn of Travois, and Michael Kramer of Natural Investments also provided input to the working group. This work combined with community feedback provided at the Summit and in surveys afterwards informed the perspective of the Land-Water Roadmap.

Photo: Panelists Ian Chan Hodges (Responsible Markets), Alohalani Smith (`Aha Moku O Kaupō), Rep. Lynn DeCoite, Sam Akoi (Hāna `Aha Moku) Eva Blumenstein (Maui County Dept of Water Supply), Ian Monroe (Etho Capital), Gitanjali Swami (IoTask), Michael Williams (Maui Tomorrow, not shown)

IoTask



RESPONSIBLE Markets LLC

July 2020

STRATEGIC ASSESSMENT, ROADMAP & RECOMMENDATIONS FOR EAST-MAUI WATER-LAND ECOSYSTEM & WATERSHED

Gitanjali Swamy
Shay Chan Hodges
Ian Chan Hodges
Imogen Rose-Smith
Phillip Auerswald
Sanjay E. Sarma

Submitted to Maui County Government

THE ORGANIZATION OF REPORT IS IN 7 SECTIONS

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THE SECTIONS ARE:

1. Executive Summary and Questions for Action
2. Vision-roadmap for a Better Economic and Social Future with Respect to Water and Land
3. **Economic Analysis** to Support the Aforementioned Vision
4. Assessment of **Stakeholder Requirements** from the Water
5. Assessment of the Current **State of the Water Systems**
6. Assessment of the **Legal Situation of the Water Systems**
7. Assessment of the **Frameworks and Best Practices in Technology** for Water Systems
8. Conclusion

Notes: Hawaiian spellings may be inconsistent due to varied information sources and translations

EXECUTIVE SUMMARY: TODAY MAUI HAS A UNIQUE, URGENT OPPORTUNITY TO ENVISION AND CREATE A DIFFERENT, ACHIEVABLE AND COMPELLING FUTURE

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1. Water is a **Public Trust** with dual objectives of protection and maximum reasonable beneficial use – these are **not being met today**.

2. **Stakeholders require significant changes** to the East Maui water situation in order to meet their needs that include environmental, social, economic and participative governance issues.

3. The **EMI water infrastructure** that delivers this water is **complex, non-standard and in a state of disrepair** – combined with the lack of transparency, legal restrictions and varied ownerships, it is **unable to meet stakeholder requirements**.

4. Thus, **legal, structural, economic hurdles create a gridlock** that results in unsatisfied stakeholder need and inability to meet goals of the public trust.

5. Legal interventions such as **eminent domain may provide long term solutions** though resolution could prove costly, time-consuming and risky. However, launching such actions could also generate additional political options for the near term.

EXECUTIVE SUMMARY: TODAY MAUI HAS A UNIQUE, URGENT OPPORTUNITY TO ENVISION AND CREATE A DIFFERENT, ACHIEVABLE AND COMPELLING FUTURE

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6. The current **gridlock can be solved** in the short term by **harnessing technology and innovation** to take the first steps towards **measurement, monitoring and management** without interfering legal restrictions to stall progress.

7. These technology solutions provide **data that can then be used to re-negotiate legal boundaries** and provide win-win solutions to all stakeholders.

8. In the long run it is critical to create a more **holistic re-adjustment of both water and the associated land** with new types of use through **innovation, technology and new economic models** for participation.

9. There is a **unique opportunity** to support the community's work and to **envision a different type of future** over the next 10 years and to instigate **broad-based change** today.

VISION & ROADMAP RECOMMENDATION

VISIONING CLARIFIED THE DESIRED END GOAL

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- **Restoration of respect, tradition and opportunity** with holistic land, water readjustment.
- **Addressing stakeholder needs** with total transparency, accountability and participation.
- **Community-led** care and sustainability of the watershed**.**
- **Ahupua`a values driven approach** to utilizing technology and innovation for a sustainable, participative economy and jobs.
- **Maui as a center for Ahupua`a-based ESG sustainable agriculture, food security and water innovation.**

SUMMARY OF APPROACH

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- **We identified a ten year vision based on:**
  - Current assessment of the state of the system and legal constraints
  - Stakeholder assessment of requirements and needs
  - Technology, ESG and best practice assessment from around the globe
- **The vision was broken into 4 workstreams: Technology, Infrastructure, Legal & Governance, Economic.**
- **The vision was then converted into a roadmap of action steps in Year 1, Year 2, Year 3/4, Year 5 and Year 10.**

STAKEHOLDER INTERVIEWS IDENTIFIED 10 NEEDS RELATED TO THE STREAMS OF EAST MAUI AND THE EMI AQUEDUCT

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- Provide **fair access** to streams, stream water and surface water
- Address **watershed management & stream care** with return of water to the streams
- Address depreciation of **EMI infrastructure**
- Ensure **monitoring and data** on stream flows, rainfall, and traditional usage
- Ensure support for **traditional uses**
- Ensure sustainability including **long-term sustainable yields**
- Provide **transparency, oversight and allocation** prioritization
- Provide **environmental protection**, including flora & fauna
- Address incentive misalignment & **private sector accountability**
- Enable public stakeholder representation in **water governance**

Source: EIS Focus Groups, RM Interviews, IoTask Analysis 2020

THE BROADER COUNTY AND STATE PRIORITIES TODAY MUST ALSO BE FACTORED INTO THE NEEDS

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ECONOMIC DEVELOPMENT

- Growth, rebuild, jobs creation,
- Post Covid exigency - 35% unemployment

ECONOMIC PARTICIPATION

- Poverty, economic disparity
- Native Hawaiians experience worst economic indicators compared to other groups

FUTURE OF WORK – TECH DEVELOPMENT, BROADBAND INFRASTRUCTURE

- High quality employment from a better future of work
- Lack of opportunities for technically proficient talent

CLIMATE CHANGE PRESSURES BECOME CRITICAL

- Highest ever temperatures recorded
- Natural resources are depreciating

FOOD SECURITY

- 90% of food is imported

Source: Maui County Government 2020

WE IDENTIFIED 4 *WORKSTREAMS* FOR THE ROADMAP TO GET TO THE VISION

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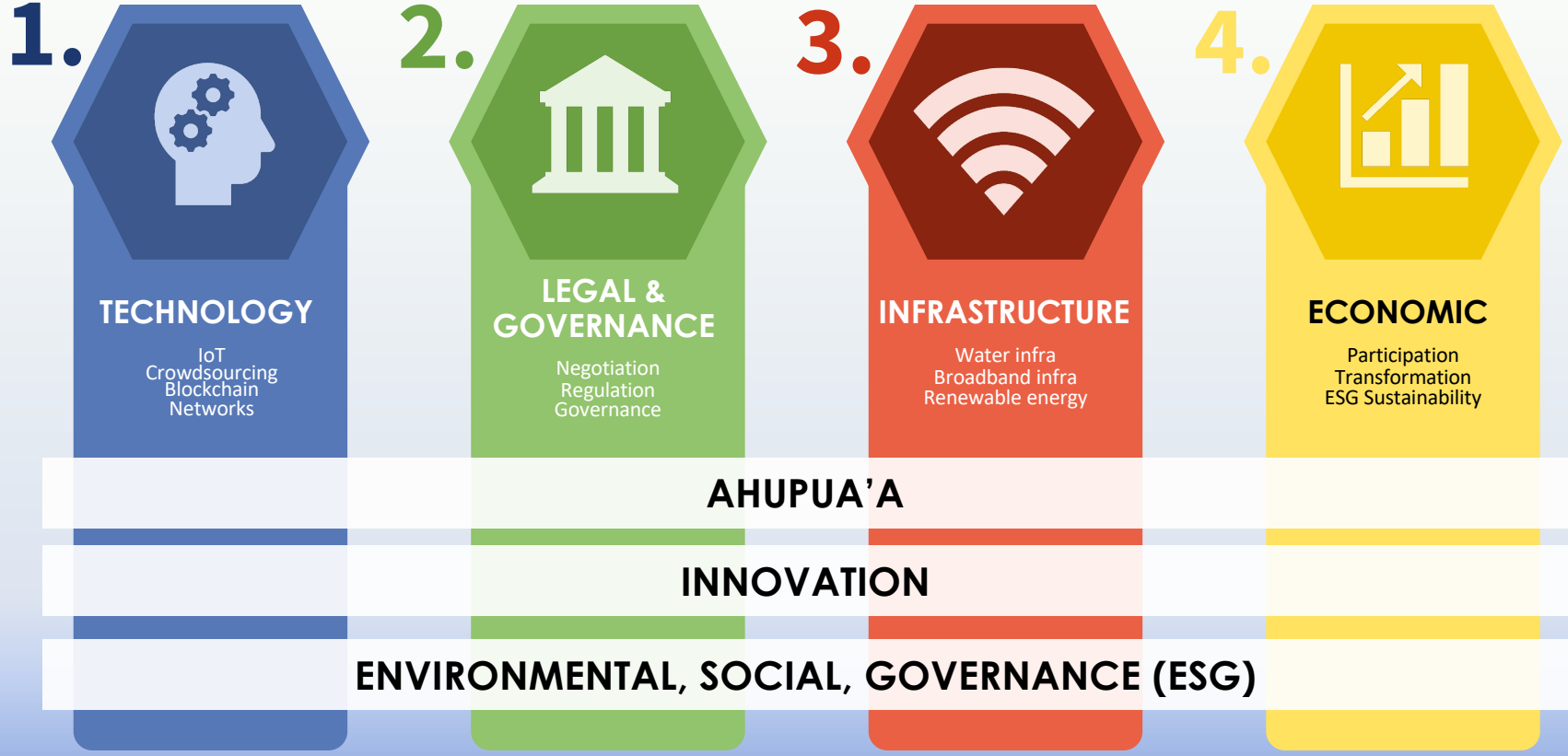

MAPPING OUT THE STAGES OF ACTION TO REALIZE THE VISION

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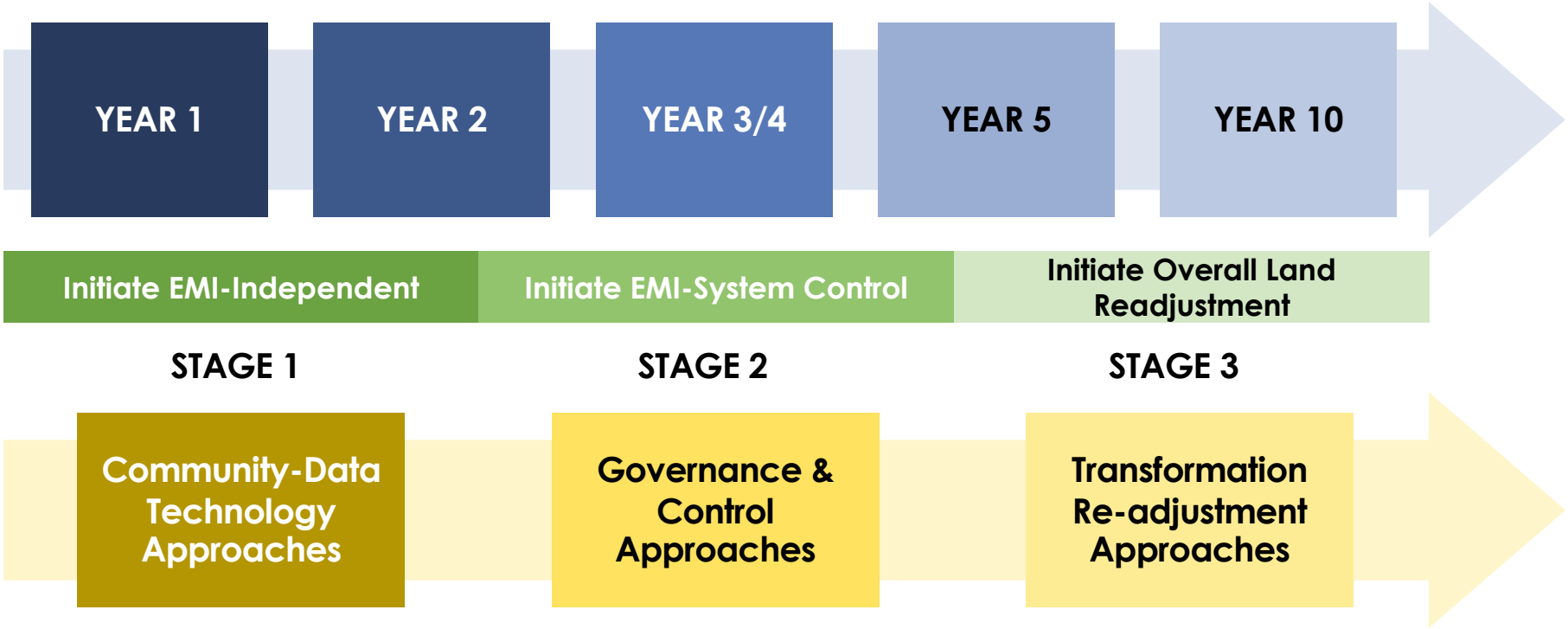
INITIAL STAGES FOCUS ON EMI-INDEPENDENT HIGH VALUE INTERVENTIONS – LATER STAGES ATTEMPT TO FACTOR IN PUBLIC CONTROL OF EMI AND SURROUNDING LANDS



We conducted a three-pronged approach to understanding the economic potential of different scenarios:

- Revenues: We looked at options of better use of land and other demand generation
- Costs: We looked at the costs of upgrading infrastructure using next-generation technologies
- Social and environmental impact: At every stage, we sought options that would strengthen communities, respect heritage, and nurture the natural environment in East Maui

ECONOMIC WORKSTREAM

ECONOMIC

Participation
Transformation
ESG Sustainability

- **Create new models for end-use to enhance demand and viability**
  - Low-income housing
  - Different agricultural crops
  - Smart sensorized eco-tourism
  - IoT enabled precision agriculture
  - Food for local consumption
- **Develop the best balanced multi-use model for land and water**
  - Initiate and complete land-water readjustment plan
  - Analyze options for land-water use with community input
- **Leverage established centers for excellence to change economic model**
  - Establish Maui center for excellence in ESG, regenerative agriculture, water technology

THE ECONOMIC ANALYSIS SUGGESTS MANY BETTER OPTIONS FOR THE COUNTY

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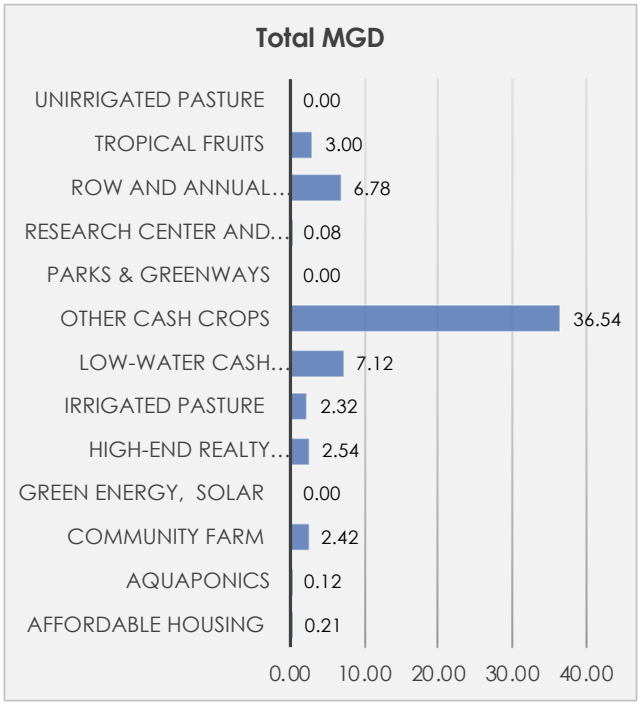
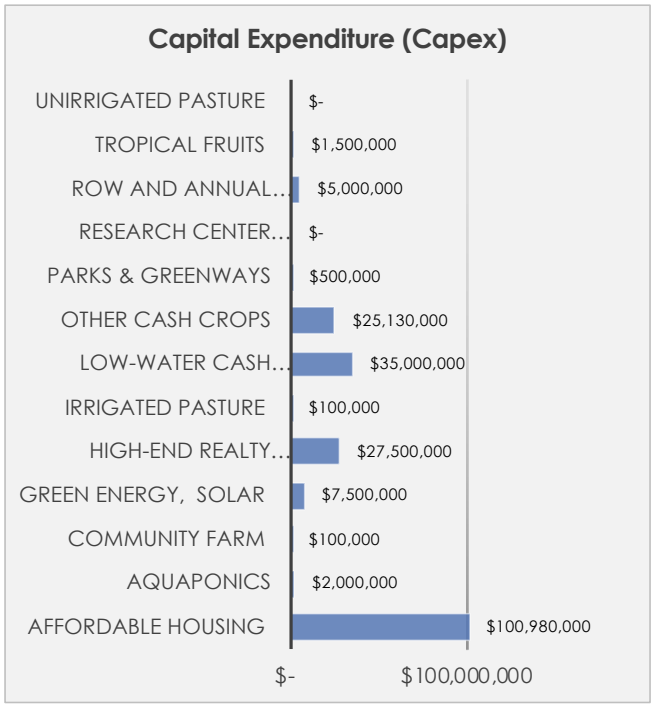
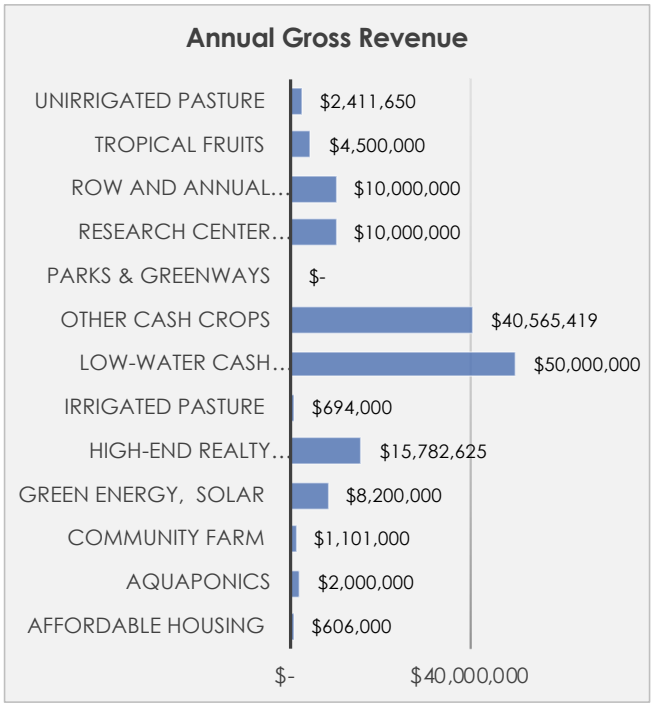
- In order to illustrate, we constructed one scenario out of many possible. Experimenting with economic scenarios shows that many other better uses of land-water with comparable returns but better social, economic, governance and cultural outcomes exist.
- Economic analysis suggests far better options exist for the water use
  - Land can yield **90%** of the gross revenue that Mahi Pono has estimated to be attainable with the requested water lease.
  - While returning more than **30%** of the water requested under the lease to the streams.
- With additional water efficiencies such as IoT-supported "smart" irrigation systems, Mahi Pono can likely **return more than 60% of the water requested under the lease to the streams** and still yield 90% of the gross revenue projected previously.
- This suggests that **maintaining the current level of diversion is not a requirement for ensuring that the land is commercially viable for Mahi Pono.**

DIFFERENT END-USE OPTIONS FOR A TOTAL 30,000 ACRES RESULT IN SIGNIFICANT OPTIONS FOR IMPROVED OUTCOMES







LOW WATER CASH CROPS PROVIDE A COMPELLING ALTERNATIVE

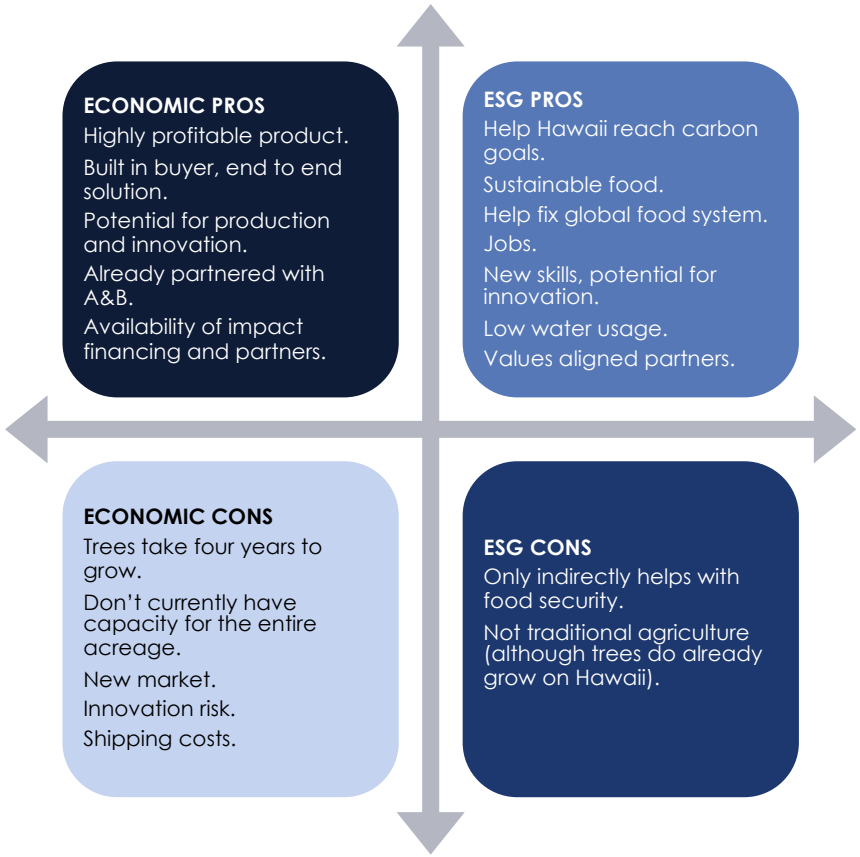
Note: There is NO CAPEX associated with the Research Center because the model assumes a separate funding source
Source: IoTask team analysis 2020

INNOVATION CROPS LIKE PONGAMIA HELP REACH SUSTAINABLE FOOD GOALS

PONGAMIA TREES ON OAHU'S NORTH SHORE.

Ag tech start up Terviva is already active in Hawaii and on Maui.

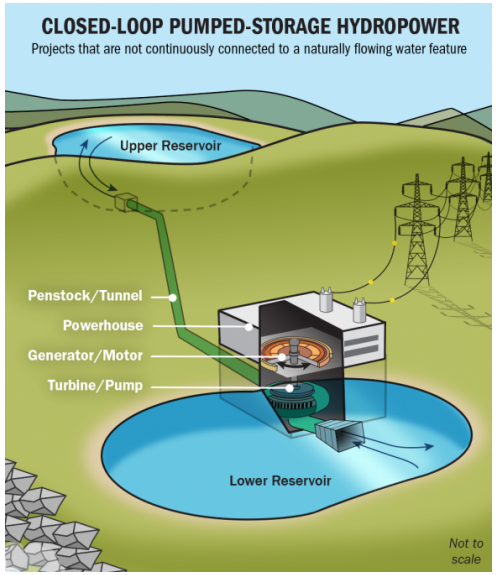
"We offer an economically attractive, permanent crop with low input costs, mechanical harvesting and a diversified basket of protein and oil products for food, feed and fuel."



Source: https://www.terviva.com

SOLAR + PUMPED STORAGE TO REDUCE ENERGY COSTS AND HELP REACH CLIMATE GOALS

Agrivoltaics with reservoir pumped hydroelectric storage can provide multiple benefits across the Food-Energy-Water nexus.



ECONOMIC PROS

Low operating costs once established.

Work with known partners e.g. Maui Electric.

Increase crop production.

ESG PROS

Helps Hawaii achieve its climate goals.

Low water usage.

Increases food security

ECONOMIC CONS

Higher set up costs.

Lower density of PV panels.

Economic benefits untested at scale.

ESG CONS

Potentially low job creation.

Potentially low aesthetics.

EVENTUALLY THE MOST ROBUST OPTION IS A PORTFOLIO OF MIXED USE

Woods Hole Oceanographic Institution (above) provides another model for a research center – in this case, dedicated to ocean research, exploration, and education.

A mixed use scenario would take the best of these ideas combined in a way that is profitable for investors, sustainable, and accretive to the community.

A plan could include:

- University campus or research center
- Innovation hub
- Sustainable regenerative agriculture
- Renewable power
- Community farming
- Affordable housing

University of Hawaii Maui College has a 4-year Sustainable Science Management program and the Sustainable Living Institute of Maui (SLIM) that could be potential partners and collaborators.

TECHNOLOGY FORMS THE FOUNDATION OF THE VISION FOR THE FUTURE

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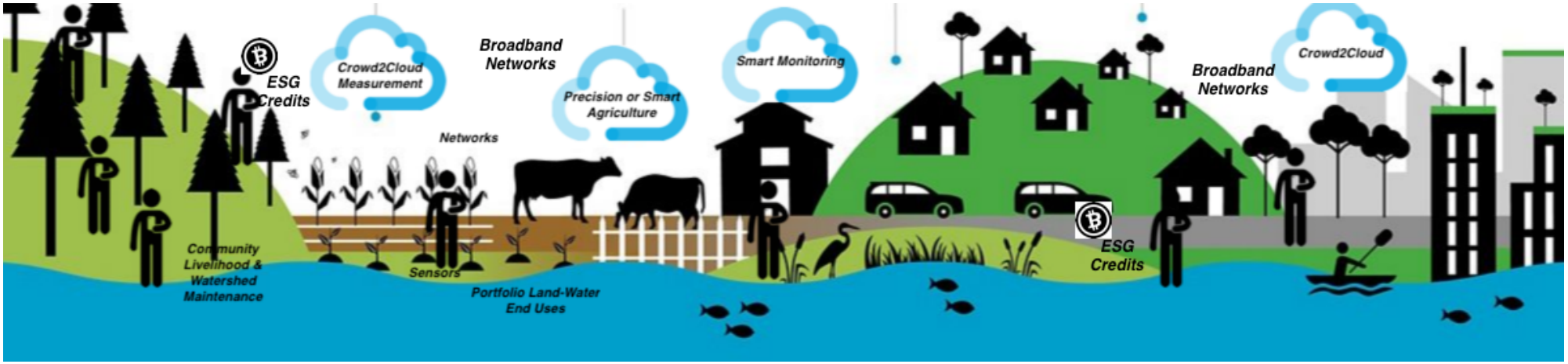
MODEL OF SMART WATERSHED



DEFINITIONS:

- ***Crowdsourcing*** refers to the practice of obtaining information or input into a task or project by employing the services of a large number of people, typically via the Internet.
- ***Crowd2Cloud*** directly aggregates crowd-sourced data in the network cloud.
- ***IoT (Internet of Things)*** is about extending the power of the internet beyond computers and smartphones to a whole range of other things, processes, and environments. IoT systems are sensor-enabled software-defined systems that are a combination of product, application, analytics and the Internet/networking. They are scalable, upgradable, automated and future ready and are often also referred to as "Smart" technology.
- **ESG** stands for Environmental. Social and Governance, a commonly used term to refer to public good impact other than monetary.

Source: IoTask led visioning 2020

MAUI IS WELL POSITIONED TO BE A CENTER FOR SMART IOT APPLICATIONS

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- **Maui is highly diverse and international.**
  - Socially and ethnically global in culture.
  - Progressive and willing to innovate.
- **Maui is relatively small and contained in area.**
  - Far more akin to cities than rural in terms of distance challenges.
- **Maui County is made of discrete power, transportation and telecommunications grids.**
  - Water distribution systems are also isolated.
  - Geographic advantage in deploying new innovations in an isolated real-world environment that is fully grid integrated with limited impact from outside variables.
- **Maui County can provide valuable research opportunities with regard to climate change and biodiversity.**
  - The state of Hawaii has 10 of the world's 14 climate zones.
  - The Hawaiian Islands are the most isolated populated land mass on the planet.
  - Hawaii is home to a large number of endemic mammal, fish, bird, insect, and plant species, many of which are endangered.
  - Cloud forests of East Maui may be the most sensitive and vulnerable to climate change.

MORE IMPORTANTLY, THE ESG IMPACT CAN BE SUBSTANTIVELY BETTER

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Our plan results in substantial Environmental, Social & Governance (ESG) benefits:

- Respect for, and strengthening of, the **cultural and economic practices** of native Hawaiian communities in East Maui through restored stream flow.
- The creation of **high-quality jobs and job-training opportunities** in a variety of industries, including technology, agriculture (including horticulture), "tourism 3.0" and a world class research and education center on Maui.
- The **mitigation of flood and fire risks**.
- The creation of a **world-class research center** upcountry and/or in East Maui, similar to the Santa Fe Institute in Santa Fe New Mexico, or the Woods Hole Oceanographic Institute in Woods Hole Massachusetts, in a manner consistent with the Community Plan.
- Construction of **affordable housing** in a manner consistent with the Community Plan.
- Support of community **food security** priorities.
- The creation of a **global model for the stewardship** of land and water resources to strengthen communities.

Note: ESG defined earlier refers to Environmental, Social and Governance.

ROADMAP YEAR 1 PRIORITIES: DATA, MEASUREMENT, COMMUNITY ENGAGEMENT, EDUCATION, HAZARD REDUCTION

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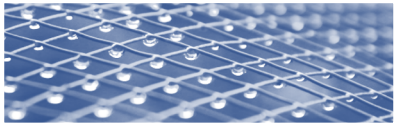
TECHNOLOGY WORKSTREAM



- Community crowd-hydrology – basic measurement and livelihood for 20% streams
- Extension of community-based stream measurements and maintenance
- Simple prototype with 50-100 persons linked to Covid-19 recovery job creation
- Develop Smart-app for data collection and collation
- Collaborate with existing monitoring programs
- Establish additional monitoring programs from the mountains to the sea
- Survey existing local sustainable agricultural and food security innovation initiatives

LEGAL AND GOVERNANCE WORKSTREAM

- Establish community-engagement model and process
- Acknowledge historic land-water claims and mechanisms for achieving equitable, practical resolution
- Develop mechanisms for valuing and rewarding community contributions to intellectual property development
- Put EMI water contracts leases in abeyance pending data-driven re-negotiation
- Apply for state leases
- Full analysis of the county's power and functions under current legal and regulatory framework

INFRASTRUCTURE WORKSTREAM

- Engage with infrastructure advocacy groups
- Engineering assessment of EMI to identify hazards
- Support digital communications infrastructure.
- Engage with federal programs for broadband
- Support 90% coverage but no last mile
- Explore last mile solutions
- Design community tech education programs

ECONOMIC WORKSTREAM

- Develop the capital and partner community
- Kickoff county vehicles for funding
- Initiate land-adjustment process
- Research and socialization land-water readjustment process
- Investigate sources of demand and supply of land - Low income housing

Source: Current Assessment, Stakeholder Assessment, Technology Assessment, Responsible Markets, IoTask Analysis 2020

ROADMAP YEAR 2 PRIORITIES: EXECUTION, INCREASE COVERAGE, EMI INTERVENTIONS

TECHNOLOGY WORKSTREAM

- Begin smart sensors hardware for community crowd-hydrology
- Complete 50% stream measurement
- Begin cloud-based dashboards for monitoring
- Begin smart water management
- Negotiate Mahi Pono-EMI water-use through crowd-hydrology data
- Identify global patterns for food security and sustainable agriculture innovation
- Establish roadmap for sustainable agriculture and food security on Maui

LEGAL AND GOVERNANCE WORKSTREAM

- Council hearings on eminent domain
- Design appropriate legal structure and negotiation framework to represent best interest of the public and various stakeholders
- Revise county ordinances necessary to create general powers that enable infrastructure upgrade, investment, oversight, and revenue generation
- Draft template legislation and advocate for change in state laws if necessary
- Establish P3/Public corporation structure for EMI intervention

INFRASTRUCTURE WORKSTREAM

- Support digital infrastructure development
- 10% last mile connection
- Negotiate and initiate repairs through Mahi Pono-EMI on identified hazard repairs
- Initiate micro-hydro projects
- Identify center-institute partners
- Initiate community tech education programs

ECONOMIC WORKSTREAM

- Finalize land use plan
- Begin planting
- Start stream monitoring
- Begin reservoir restoration
- Begin solar
- Begin community farms
- Begin ranching
- Begin community park and resources
- Continue priming the capital and partner community

Source: Current Assessment, Stakeholder Assessment, Technology Assessment, Responsible Markets, IoTask Analysis 2020

IN 5-10 YEARS YEARS EAST MAUI WILL BECOME A MODEL FOR BOTH THE REST OF HAWAII AND THE WORLD

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STAKEHOLDER ENGAGEMENT COMBINED WITH TECHNOLOGY & INNOVATION, WILL ACCOMPLISH MUTUAL REINFORCEMENT OF COMMUNITY VITALITY, ECOLOGICAL SUSTAINABILITY, AND AUTHENTIC ECONOMIC DEVELOPMENT.

Jerome Kekiwi, Jr.
President Na Moku
Aupuni O Ko`olau
Hui

KEY DECISIONS FOR THE COUNTY AND COMMUNITY TO MAKE BASED ON THIS REPORT

- Which elements of the vision options will we adopt?
- Where do we want to be 1,5,10 years from now?
- Are we ready to start today?

WHAT TYPE OF COMMITMENT DOES THE GOVERNMENT WISH TO MAKE?

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Complete Economic Development

- Raise a large Bond for **County Economic Development.**
- The proceeds are used to invest in a portfolio of programs to realize a complete vision of a new economic future for Maui.

Center for Excellence/Institute

- Establish and seed a **Center for Excellence or Institute**.
- The center is tasked with identifying, incubating and catalyzing a portfolio of programs and technologies for the future of Maui.

Shovel Ready Innovation Program

- Fund a **high potential shovel-ready program** (such as Crowd2Cloud Smart Community data).
- Get started with community engagement, livelihood and economic stimulus through this program.