CIRCULAR BIOECONOMY INNOVATION HUB (GHANA)
STRATEGY AND WORK PLAN
2023 - 2025
&
Outcome of Launch Preparations December 2022

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Further partner logos to be added (see section 3)

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1. CONTEXT

The One-CGIAR initiative 16, *Resilient Cities through Sustainable Urban and Peri-urban (UPU) Agrifood Systems* [Resilient Agrifood Systems (UPU)] seeks to provide leadership and support to meet present and future challenges urban food and resilience challenges resulting from rapid urbanization and climate shocks and stresses. The initiative has a particular interest in linking waste/sanitation and agriculture through the Circular Economy via resource recovery and reuse (RRR). Initiative 16 has five Work Packages (WP). These are:

WP1: Enabling sustainable production of nutritious foods in (peri-) urban zones.
WP2: Building inclusive and sustainable food markets and safeguarding supply chains.
WP3**: Strengthening circular bioeconomy, food safety and the urban environment.**
WP4: Improving food environments and consumer behavior for nutrition.
WP5: **Strengthening the evidence base and research and innovation capacities** for UPU Agrifood System governance and growth.

The International Water Management Institute (IWMI) leads WP3 and supports WP5. As part of implementing WP5, a RRR innovation hub will be set up in Ghana, linked to WP3. The hub will showcase existing innovations tested by IWMI under previous CGIAR research, and facilitate capacity development and new innovations for a circular bioeconomy driven by public and/or private entities through various local partnerships.
This document details the implementation strategy, interested partners, and work plan for the hub.

2. INNOVATION HUB ACTIVITIES AND SET - UP

Proposed activities for the hub are categorized into 3 components. They are:

- **Component 1**- Capacity building on circular bioeconomy
- **Component 2**- Implementation and/or scaling of existing or innovative RRR business models
- **Component 3**- Advocacy and advisory support for policy uptake and the enabling regulatory and financial environment.

Figure 1 shows an overview of the components and sub-components of proposed activities with details following in the workplan further down.

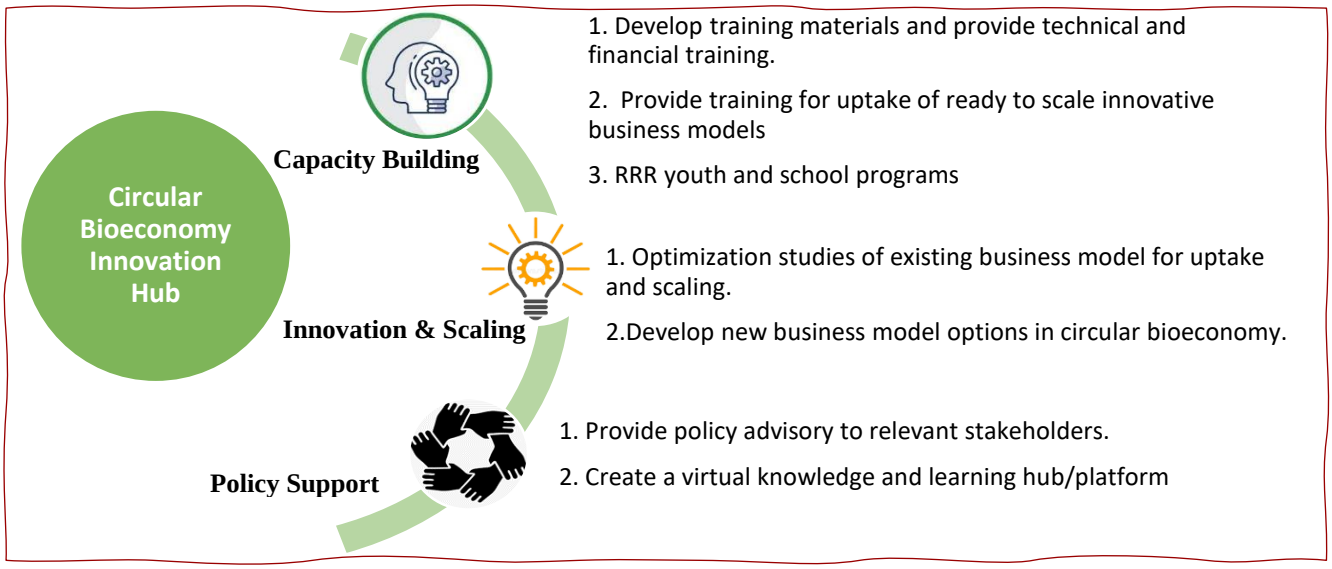
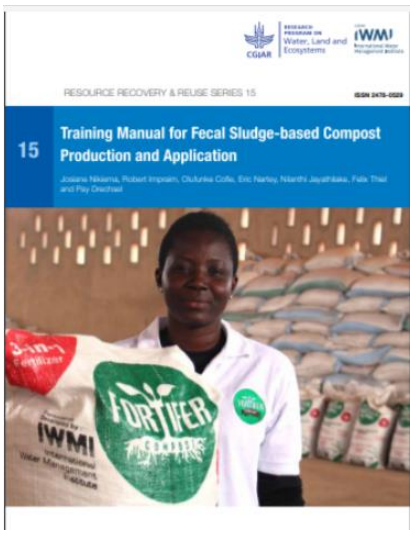


Figure 1: Overview of activity components and sub-components for the innovation hub

To ensure sustainable implementation (short and long term), continuous running and increase outreach of these activities, during and post the CGIAR Initiative phase, co-ownership of the hub activities with private institutions/NGOs (JVL, Trimark, ACARP, etc.), research institute/departments (IEES, RWESCK, etc.), government organizations (Soil Research Institute (CSIR), energy commission, etc.) is proposed. The nature and details of this co-ownership will be unpacked and defined after the launch and/or a one-on-one stakeholder engagement with identified organizations.

For the hub, the end goal is to lobby stakeholders to 'buy-in' the hubs activities as co-convener or co-owner partnership agreement with IWMI's facilitation, co-management, and if required coordination to ensure smooth operations and hub sustainability.



3. LAUNCH TALKS AND CONFIRMED STAKEHOLDER INTEREST

To ensure sustainable implementation, continuous running and increase outreach of the innovation hub activities, during and post project implementation phase, an integrated approach that creates synergies to catalyze and accelerate change under IWMI facilitation and coordination will be adopted. To do this, co-ownership/co-conveners of the hub's activities with academic/research institutions, Government agencies, waste enterprises and other key stakeholders was proposed and adopted. To this effect, we discussed individually with a set of carefully selected public and private agencies and/or institutions their interest and possible buy-in. The outcome of these engagements is detailed below.

Potential co-owners/co-conveners

We engaged with about 15 institutions/agencies from the government, research, and private sectors. The profile of each potential co-owner, their level of interest and expressed contributions to the hub are summarized in the table below.

Institution	Brief Profile	Benefits to the hub	Interest and Contact
GOVERNMENT AGENCIES & INSTITUTIONS			
Ministry of energy	Responsible for energy policy formulation, implementation, monitoring and evaluation as well as supervision and coordination of activities for Energy Sector Agencies. The Renewable energy directorate at the ministry will work closely with the hub.	• Assist with Capacity building activities by providing technical assistance and contributing knowledge to the development of training materials. • Support the hub with equipment and other resources to run the briquette related activities. • Collaborate on renewable energy policy related activities. • Advisory services to the hub.	High. Contact Details Seth Mahu 0244209710
Ministry of Sanitation and Water Resources	In charge of Water and Sanitation issues. The hub looks at working closely with the Sanitation Directorate at the ministry. They oversee coordination of the policies, programme, and projects on all aspects of sanitation sub-sector.	• Assist with Capacity building activities by providing technical assistance and contributing knowledge to the development of training materials. • Advisory services to the hub.	High Contact Details Fiifi Boadi 0249593981 fiifi.boadi@mswr.gov.gh
Ministry of Food and Agriculture (MOFA)	MOFA is the lead agency and focal point of the Government of Ghana, responsible for developing and executing policies and strategies for the agriculture sector.	• Assist with Capacity building activities by providing technical assistance and contributing knowledge to the development of training materials. • Collaborate on policy related activities - Issues with certification • Support with technical skills setting up of demonstration site. • Advisory services to the hub.	Details to be worked out Dr. Solomon Gyan crowzee2000@yahoo.com
Food and Drugs Authority (FDA)	The FDA is the National Regulatory Body responsible for the regulation of food, drugs, food supplements, herbal and homeopathic medicines, veterinary medicines, cosmetics, medical devices, household chemical substances, etc.	• Co-develop/Update certification guidelines/process/standards for circular bioeconomy products within their regulatory scope. • Advisory services to the hub.	Details to be worked out 0205888514 Secretary to the office of Director
Regional Water and Environmental Sanitation	RWESCK, is a research centre at the Kwame Nkrumah University of Science and Technology (KNUST). It is under the	• Technical Expertise in WASH/Circular economy. • Students for research – Ghana and sub-region. • Area on Campus for demonstration	High Contact Details

Center, Kumasi (RWESCK)	Africa Centers of Excellence (ACE) project with funding from the World Bank.	• Access to laboratories • Collaboration with the hub on curriculum development for the center. • Contribute technical input with development of training materials.	Prof. Oduro Kwarteng sokwarteng@gmail.com rwesckproject@gmail.com 0244598999
Institute for Environment and Sanitation Studies, University of Ghana-Legon	The Institute, which is part of the College of Basic and Applied Sciences, was established in 2010. to train the next generation of scientists that will have the skill and knowledge to innovatively tackle the environmental and sanitation issues.	• Technical Expertise in WASH/Circular economy. • Students for research – Ghana. • Access to laboratories • Collaboration with the hub on curriculum development. • Contribute technical input with development of training materials.	High
Engineers without Borders – KNUST (EWB-KNUST)	EWB-KNUST is the Ghana branch of the Global non-profit organization Engineers without Borders. In Ghana, they are located at KNUST and work with disadvantaged communities in Ghana	• Access to technical expertise with diverse engineering background (Process engineering, civil, WASH, soil, etc.) • Students for internship and training. – Already runs a student exchange programme with the University of Iowa • Volunteering Technical expertise and students to assist with, training, innovation, and scaling activities. • Adopt or integrate existing projects into the hub activities – SHS kitchen stove project or even replicate in nearby university/ community/schools).	High Fredrick Owusu-Nimo frednimo@gmail.com 0543333174
PRIVATE SECTOR			
Trimark Aquaculture Centre	The Trimark Aquaculture Centre is a PPP with Kumasi Metropolitan Assembly (KMA). The centre produces fish and vegetable from treated community sewage.	• Grant access to the hub to use facility as a living laboratory for demonstrations, field visits, training, student thesis, etc. • Share technical expertise for training, replication, etc. • Contribute technical input with development of training materials.	HIgh Contact Details Mark Yeboah yeboahagyepong6@yahoo.com 0246611091
Water and Sanitation for Urban Poor (WSUP)	WSUP is an NGO which works within the Urban space to improve access to water and sanitation services. In Ghana, they have mainly worked in Accra and Kumasi but currently expanded operations to other peri urban areas.	• Replicate IWMI business models in circular bioeconomy. • Share technical expertise for training. • Meeting space	High Contact Details Frank Kettey fkettey@wsup.com 0276748304

Jekora Ventures Limited (JVL).	JVL is a waste management in Ghana. Over the years they have developed skills in RRR and together with partners, have implement recycling programs.	• Grant access to the hub to use its' circular bioeconomy facilities as a living laboratory for demonstrations, field visits, training, student thesis, etc. • Share technical expertise for training, replication, etc. • Contribute technical input with development of training materials.	High Contact Details Martha Annan m.annan@jekoraventures.com 0208750704
Accra Compost and Recycling Plant (ACARP)	ACARP is an integrated waste processing and recycling company established to receive and process solid and liquid waste and produce organic manure for agronomic purposes.	• Grant access to the hub to use its' circular bioeconomy facilities as a living laboratory for demonstrations, field visits, training, student thesis, etc. • Share technical expertise for training, replication, etc. • Contribute technical input with development of training materials. • Replicate IWMI business models in circular bioeconomy.	High info@acarpghana.com
MDF-Ghana	MDF is a Dutch consultancy firm that provides services in training development, learning trajectories, enterprise development, evaluation, and impact, etc. Ghana hosts the West Africa regional office. with a branch office in Burkina Faso.	MDF, GIZ and our CSR foundation Centre for Enterprise Learning (www.celghana.com) are implementing a waste to value initiative: https://celghana.com/portfolio/organic-waste-to-value-initiative/ Circular economy hub is part of it https://celghana.com/about-us/ • Opportunity to showcase products at the Ghana Innovation Hub (www.ghanainnovationhub.com) which they manage with support from partners. • Support with designing and implementing capacity building programs. • Ongoing projects that can be integrated into the hub activities	High Contact Details Richard Yeboah rye@mdf.nl 0546429540
Safisana	Turns organic waste and faecal sludge into high value products: renewable energy, organic fertilizer, and irrigation water.	• Grant access to the hub to their plant as a living laboratory for demonstrations, field visits, training, student thesis, etc. • Share technical expertise for training, replication, etc. • Support with development of training materials	High Kofi Boateng kofi.boateng@safisana.org or Prosper Ayande prosper@safisana.org
Catholic Relief Services, Ghana	Mandate to tackle poverty with a holistic approach including projects that improve child and maternal health; increase access to clean water and sanitation; scale up farm production.	• Collaboratively set up a pilot composting system in Tamale as a living laboratory. • Share technical expertise for training.	Interest shown. But we must follow up Festus Fofie festus.fofie@crs.org 0546661797

Clean Team	Clean Team provides safe, affordable in-home toilets for low-income families.	• Replicate IWMI business models in circular bioeconomy. • Grant access to the hub to their plant as a living laboratory for demonstrations, field visits, training, student thesis, etc. • Share technical expertise for training, replication, etc. • Co-develop a circular bioeconomy activity for Clean Team	High Abigail Aruna abigail@cleanteamtoilets.com 0246992457

NEXT STEP

Next activities for the hub are listed below with respective timelines

1. **Formally invite all the potential co-owners**

All potential co-owners engaged has expressed positive interest in co-owning the hub. To make things official, a formal letter will be written inviting them to be part of the hub as co-owners. The letter will request each institute/agency to submit the contact details of a focal person for follow up engagements. The plan is to do this latest by Thursday, 8th December 2022 upon approval.

2. **Organize a workshop with co-owners (institutional launch)**

As a follow up to the invitation letter, it is proposed an in-person meeting for all the co-owners of the hub is organized upon approval. A revised conceptual framework for the hub will be attached to the invite. Suggested details of the meeting are:

Proposed date: 15th or 16th December 2022. Or early 2023.

Location: IWMI office

Agenda:

- Introduction of co-owners to each other and IWMI.
- Discuss in detail what co-ownership of the hub means(responsibilities), the role of IWMI, etc.
- Discuss details of agreement to be signed
- Present detail strategic work plan for the hub for input and further discussions.
- Agree on next steps
- AOB.

Budget estimate: USD 460

4. STRATEGIC FRAMEWORK

COMPONENT 1: **Capacity building on circular bioeconomy**				
SUB – COMPONENTS	**ACTIVITIES**	**SUB ACTIVITIES**	**STRATEGY**	**EXPECTED OUTPUT**
Develop training materials and provide technical and financial training to Professionals, MMDAs staff, MSMEs, Industries, NGOs, etc.	1. Identify stakeholders/groups for training. (e.g., school children, University students, MMDAs etc.)	1. Conduct baseline/scoping studies	1. Conduct a desk study and engage Partners / Key contacts from previous projects 2. Prepare a list of all potential stakeholders/groups/partners with brief description. 3. Prepare a shortlist of stakeholders after and discuss with RRR Team in Ghana 4. Engage shortlisted stakeholders - Meeting each stakeholder groups to get their buy -in. 2. 5. Finalize the list of stakeholders with Pay.	Report on stakeholders/groups/ and their training needs
	3. Determine the training needs of the identified various stakeholder/groups.		1. Identify the training needs of each stakeholder group (using appropriate means e.g., short interviews, FGDs, key informant interviews etc.) Training needs could be circular bioeconomy business models and linkage to agriculture, design, setting up, testing, operationalization, scaling, and financing of circular bioeconomy businesses, etc.	
		Resources Required: Transportation for the meetings		
	3. Design and develop training materials that aligns with training needs of the identified stakeholders or groups.	1. Select the different training materials depending on the various training needs. 3. Plan and Prepare content for each training material 4. Print/Publish training materials.	1. Check existing training materials (e.g., videos, flip charts/posters, powers points etc.) and select relevant ones for training. 2. Write content for the new materials depending on the needs. 3. Hire graphic designer and videographer/animator (if necessary) to develop the training material. 4. Compile and edit	1.Compiled list of existing manuals relevant materials for the training (e.g., videos, PPs, Printed /Published training resources - Training manuals, flyers, videos, posters., power point slides, etc.).
		Resources Required: Hire Graphic designer and/or an animator**,** materials printing cost.		

	1. Plan and organize training - consider training materials. 2. Conduct training.	1. Select and adopt suitable training methods 2. Fix training dates and make necessary internal arrangements - logistics, etc. 3. Invite selected stakeholders/groups to partake in the training.	1. Training methods examples for adaptation are: one day training course, facilitated/participatory workshop, field visits and demonstrations, Signposting information, and resources, etc. 2. Design and Issue training certificates 3. Conduct assessment for participants **For field training,** **1.** Set up demonstration sites at existing living laboratories (we can start with what we have i.e., the JVL-YKMA Recycling plant, TriMark and work on getting more circular bio economy SMEs to be part of the hub). Demonstration fields activities (depending on the location) will cover – • briquette production (carbonize and non – carbonized briquette), briquette from FS, • windrow composting, Co-composting (incl. FS treatment), pelletizing, fabricate and showcase a simple locally made vacuum trucks for FS desludging, • wastewater treatment (the Somanya plant will be a good site-There is an opportunity to design and construct/or install prefabricated unit to further treat effluent from the ponds before discharge or reuse for agriculture). • Fish & wastewater, wastewater & biogas, fish wastewater for greenhouse farming, • developing food waste source separation program (within local context),	1. Stakeholders/groups/partners - Relevant staff MMDAs, SMEs, Industries trained, and report prepared 2. Training certificates awarded 3.Filled participants assessment compiled

		Resources Required: Means of transport for staff, budget for certificates and transportation allowances for participants. **For participatory workshop activities:** Stationary, training tools (for teamwork, group discussions, that will allow simple 3d modeling), etc. **Materials needed are for field activities:** to set-up demonstration sites at existing living laboratories – Mini biochar unit and briquette production units for carbonized briquette, tools to set-up farming activities, PPEs, a small composting platform constructed, a small pelletizing unit for compost, Production Process info graphics, etc.		
	For training involving field demonstrations and visits, existing circular bioeconomy businesses will be partnered to be used as demonstration sites and living laboratories. To do this, the following will be done: 1. Identify the circular bioeconomy businesses willing to collaborate with the hub - including JVL-YKMA Recycling Plant. 2. Define the terms of the collaboration 3. Conceptualize and implement demonstration/field visit activities	The following will be done to identify circular bioeconomy businesses for collaboration: 1. Conduct baseline studies within the circular economy space in Ghana. 2. Engage with existing circular bioeconomy businesses. 3. Define collaborative terms, draft, and sign agreements. 4. If required, set up small scale demonstration sites that aligns with the training manuals and research interest of the hub.	1. Conduct a desk study and engage with known circular economy businesses IWMI projects or other projects. Prepare a list of all potential circular bioeconomy businesses apart from JVL/YKMA Plant and the TRIMARK aquaculture business) for partnership/collaboration. 2. Shortlist after discussion with RRR Team. 3. Engage shortlisted businesses - site visit, meeting if necessary. 4. Finalize the list 5. Define terms/conditions for partnership/collaboration 6. Draft agreement and Sign 7. Recruit interns to assist with demonstration plant set – up.	1. A report on circular bioeconomy businesses for collaboration/partnerships listed with brief descriptions of BM and potential areas for collaboration. 2. Terms of collaboration/partnerships clearly defined, drafted, and signed 3. Demonstration sites set up 4. Training and field visits conducted
		Resources Required Means of transport for staff. Proposed activities and resources have already been captured above. More ideas will come up once other circular bioeconomy businesses join the hub in addition to the IWMI linked projects.		

Training for Uptake of ready to scale innovative business and financial models in RRR.	1. Identify and catalogue IWMIs business and financial models that are ready for commercial uptake. 2. Identify partners/stakeholders that can uptake these business models for commercialization.	1. Catalogue the business models in a brochure / etc. with financing options/recommendations. 2. Conduct demand studies - identify potential partners/businesses interested, their technical expertise, financing capabilities. 3. Meet the identified potential partners and/or invite to ensure interest	Targeted groups for this training are NGOs, International Organizations, Ministries, etc. e.g GiZ, SNV, Catholic Relief, WB, AfDB, Ministries, IDE, etc. 1. Workshop 3. Develop an uptake/Replication program by 1. Preparing an uptake/scaling toolkit/manual for IWMI linked living laboratories (Somanya and Kumasi). 2. For the selected business models for uptake set-up small scale demonstrations (if this is not already demonstrated at the living laboratory). 3. Organize field trips 4. Engage with identified stakeholders for uptake – technical dialogues, training participatory, workshops, etc.	1. Catalogue of business models ready for uptake 2. Potential scaling partners identified. 2. Demonstration sites set-up 3. At least 1 uptake program done.
	3. Uptake for Implementation	4. Organize events that will provide training, tools technical, economic & financial support for to make stakeholders ready for uptake.		
		RESOURCES REQUIRED: means of transportation, graphic designers (to finalize uptake tool kits), materials and tools for demonstration site set-ups		
RRR school and youth programs.	1. Identify the educational levels (Basic, Secondary, and tertiary) to include, and select the schools. 2. Identify training needs and knowledge gaps for each educational level.	1. Discuss with RRR colleagues on the target age range to guide selection of educational levels For Basic and secondary educational levels (JHS and/or SHS) 2. Select JHS and SHS schools of interest. 3. Engage relevant school authorities or	1. Organize meetings with RRR colleagues. 2. Write a letter to GES or Develop an internal selection criterion. 3. Visit schools and meet school heads, teachers, and students to introduce them to concept of circular bioeconomy. 4. Use questionnaire and/r Direct engagement - Recruit interns to assist with data collection.	A report on educational levels to be used, participating chools and circular bioeconomy knowledge gap prepared.

		management (and students) 4. Conduct field assessment to establish baseline situation and opportunities in JHS and SHS for circular bioeconomy activities. For universities 1. Identify departments, research centers, student professional groups, etc. that can collaborate with the hub. 2. Engage with the identified schools to determine student/center training needs, research interest funding to support hub activity. 3. Short list potential schools and finalize. 4. Prepare agreements and sign for both basic, secondary, and tertiary participating schools.	1. Conduct desk study and/or contact departments, research centers, etc. within IWMI internal contacts. 2. Invite/visit for a meeting. 3. Internal meeting to discuss pros and cons of each partner, etc. 4. Together with the selected dept., research center, student professional groups, etc. meet to develop activities 5. Draft agreement, review and finalize	1. Participating tertiary departments, research centers, student groups identified 2. Areas of collaboration established. 3. Agreements signed
		Resources Required: Means of transport for staff.		

	1. Design and develop capacity building programs to align with training needs. for the various educational levels.	1. Adapt a training concept – (e.g., the design thinking process) and develop various training techniques to deliver training content for each educational level. 2. Based on the training concepts, develop activities and contents (mainly participatory and field work) to be undertaken by for each educational level.	1. lectures, presentations, demonstrations, group discussions (small/large), case simulations (oral, posters, videos) and model building are some of the training techniques that can be adopted as a medium to deliver training content. 2. To do together with selected partners concepts for activities such as RRR Quizzes, curriculum development for tertiary (University) and teaching, Internship programs, field trips and demonstrations at living laboratories, using existing plants as living laboratories for student thesis, etc. will be developed.	Training methods established. Conceptualization report on proposed activities for basic, secondary, and tertiary schools prepared.
		Resources Required For Some proposed activities: Means of transportation for staff and schools, materials for participatory works (stationary, white screen, beamer projector), tools for field demonstration/field work (different household/garden composter and compost platform to show various technologies, food waste/organic waste separation tools to showcase the mechanisms, mini laboratory kits for sampling and sample preservations from site (for student thesis), home gardening kits for training, Tee shirts, trophies and medals for the quizzes and competitions, materials for food fair etc.		
	1. Develop training materials that aligns with all contents and activities developed for the various educational levels.	1. Design materials depending on the various training needs and activities prepared. 2. Print/Publish training materials 3. Implement activities	1. Materials such as: Flyers, signpost, pull up banners, manuals, videos, animations, etc. 2. Plan and prepare logistics, training schedules/program outline for all the trainings organized for the year 2023	1. Training materials and logistics prepared 2. Training schedule for participating schools prepared. 3. At least 200 students and 1000 school children trained/exposed to RRR in 2023.
		Resources Required: Hire Graphic designer and/or an animator**,** materials printing costs		

COMPONENT 2: **Implementation and/or scaling of RRR business models**				
SUB – COMPONENTS	**ACTIVITIES**	**SUB ACTIVITIES**	**STRATEGY**	**EXPECTED OUTPUT**
Optimization studies of existing business model for uptake and scaling	1. Identify optimization areas for existing circular bioeconomy businesses (Living laboratories (Those already in partnership/collaboration with the hub will be part of this).	1. Assess production process for living laboratories - (mainly compost, wastewater aquaculture and briquette). 2. Engage Operators of the living laboratories and product users for feedback on challenges experienced (e.g., JVL, Safisana, zoomlion, the authorities, the compost sellers/users, etc.). 3. Visit other subregional or regional circular bioeconomy businesses and engage on uptake, scaling, finance, etc	1. Works of living laboratories on mainly compost wastewater aquaculture and briquette processes will be evaluated. (Briquette machine training with the Indians will start the process, it is part of the briquette optimization studies commissioned), including setting up agricultural demonstration farms to further test compost (fortifier) to guide the preparation of detailed product description and application manual.	1. Optimization areas identified - report
		Resources Required Staff means of transport, budget for study tour.		
	1. Design optimization research activity in collaboration with research partner. 2. Conduct optimization studies	1. Develop research questions based on the identified areas for optimization. 2. Experimental design and set-up with students from research partners 3. Data collection 4. Results analysis, make recommendations for implementation, publish results, and promote uptake.	1. Recruit students through the university partnership/collaborations to conduct student thesis (2BSc, 2MSc and 1PhD). 2. Student internships to assist with data collection.	1. Research questions developed. 2. Student thesis done. 3. Internship reports 4. At least 1 uptake done. 5. Publications
		Resources Required: Staff means of transport, budget to support student research work.		
Develop new business model options in circular bioeconomy.	1. Determine resource recovery options suitable for adaptation – 2. Identify suitable waste streams for resource	1. Review IWMI and IITA literature/work on BSF (Black Soldier Fly) .	1. Areas for consideration are - Black Soldier Fly (digestate from anaerobic digestion of FS) and Food waste, etc. – Link up with IITA for the BSF work	1. Preliminary feasibility study report – IITA work on BSF, linkages to the hub and the way forward.

	recovery and perform preliminary viability assessment.		2. Local field work - to identify waste, sample for characterization, quantity, risk to sourcing, etc. 3. Conduct laboratory work. 4. Learning trips - Visit other circular bioeconomy businesses to understudy.	
		Resources Required: Staff means of transport, Travel budget		
	1. Develop business model.	1. Prepare Business Model Canvas (BMC) for the various circular bioeconomy options	1. BMC done to reflect readiness for commercial uptake 2. Attend conferences to present findings	1. Detailed BMC is ready for uptake
		Resources Required: Staff means of transport, budget to support student research work.		

COMPONENT 3: **Advisory for policy uptake and creation of an enabling environment (t.b.d.)**				
SUB – COMPONENTS	**ACTIVITIES**	**SUB ACTIVITIES**	**STRATEGY**	**EXPECTED OUTPUT**
Provide policy advisory and support	Identify stakeholders/ partners/groups/etc.	Conduct baseline studies/scoping - Partners to co-lead, clubs or groups already doing work in this area, etc. Conduct studies on current policy gaps and needs, bottlenecks, etc.	Conduct desk study and contact people already known through IWMIs presence in Ghana. Engage with identified stakeholders/groups/association, etc. - Establish - what's is existing - who is doing what? What are the bottlenecks? How can innovations hub support? Etc. Literature review - on policies within the circular bioeconomy space and gaps, potentials.	Report on key players/partners/stakeholders identified - brief descriptions bottlenecks prepared A review paper or/and white paper on circular bioeconomy policy status, gaps with recommendations published. Different engagement events organized leading to revision/drafting of at least 1 Policy document.
	1. Engagement and mobilization	1. Together with Partners/stakeholders communicate findings to identified stakeholders. 2. With strategic partners as leads, co-develop activities and implement.	1. Communicate findings - Through technical dialogues, workshops, networking events, etc. 2. Brainstorm, ideate - with partners, etc. 3. Activities - Advice on policy updates, write and publish findings on gaps and recommendations together with relevant ministries, support initiate the process of the setting up of committees for policy reviews and updates, or writing new policies, etc.	
Create a virtual knowledge and learning forum/hub/platform/community	1. Conduct baseline survey - what is in existence in Ghana. 2. What are the various groups who can join the virtual hub as founding members/contributors. (Members/contributors is expected to increase with time).	1. Desk study and research on potential stakeholders 2. Conduct knowledge needs assessment	1. Search online, use contacts within IWMI and contact known key stakeholders - is there a virtual or physical learning hub? Can the hub build on work done? Or create a new system? What was the mandate? What is the status? Who are members of the existing hub? etc. 2. Meet various stakeholders/groups/etc. and interview, discuss to know - where is the Gap, what more can be done? where are the bottlenecks? etc.	1. Founding members identified and written to - (the idea is to set - up the virtual learning hub as teamwork with partners/stakeholders) 2. Report written and submitted - On existing hubs, what they do, and the fundamental Gaps in their operations we need to fill, bottlenecks and knowledge needs.
	3. Discuss and outline the purpose or function of the platform	1. Using the gaps, needs and bottlenecks identified, propose fundamental purpose, and state the aim, vision, and mission for the virtual learning forum/hub/community.	1. Draft initial ideas and discuss internally, revise, and discuss with key partners (Idea is to create this platform as teamwork with partners). 2. Organize a workshop for the alliance to present ideas on core functions, vision, etc. for the knowledge and learning platform - Get feedback and improve.	1. Nature of the hub decided - build on or create a new platform. 2. Purpose, strategy, aim, and vision decided and agreed. 3. Minutes/brief report from meeting.

	4. Design the platform 5. Set-up	1. Pick a suitable online collaboration platform and develop content. 2.Identify the various components of the platform 3. Develop content for the platform 4. Discuss, define, and design the overall set up	1. Submit various options for selection - website, online community platforms (Uscreen, Plush forums, etc.) 2. Example of components are library, discussion forums, RRR data bank, website, etc. 3. Develop content especially for the library (compile the books, make room for upload), create RRR data bank (data collected on circular bioeconomy business can be catalogued and shared), forum discussion topics, Pictures, etc. 4. hire consultant to set up and design the platform with IWMI supervision	Create RRR data bank to centralize all training materials and comprehensive raw data collected from previous and ongoing RRR projects to guide policy formulation and uptake 1. Discuss and define the nature and operability of the platform 2. Collate training materials and data from IWMI RRR past and ongoing projects. 3. Identify the potential users of the site 4. Select the online platform for display 5. Design and set up the sight 6. Market content/link it to the knowledge and learning hub.
	7. Test run	1. Test internally. 2. Implement	1. Draft operational guidelines, activities, and principles for adaptation. 2. Show final product internally for comments, improvement. 3. Share externally also for comments. 4. Make final corrections/inputs. 5. Test Run the platform 5. Organize a Launching ceremony. 6. Continue running	1. Virtual Knowledge hub/platform created with the various components - Library, discussion forum, data bank, gallery, etc. 2. Launch event organized. 3. Continue to run the site with a partner organization until total transition.

2. WORKPLAN

Sub – Components	Expected Output	2022		2023												2024												2025											
		4th Qtr		1st Qtr			2nd Qtr			3rd Qtr			4th Qtr			1st Qtr			2nd Qtr			3rd Qtr			4th Qtr			1st Qtr			2nd Qtr			3rd Qtr			4th Qtr		
		N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Engage stakeholders to co-own the hub	IWMIs contribution to the hub is established. Initial stake-holders engagement done Co-conveners/ owners of the hub identified and officially informed.																																					
Develop training materials and provide technical and financial training to Professionals, MMDAs staff,	Report on stakeholders their training needs Compiled list of existing relevant materials and new training resources-																																					

MSMEs, Industries, NGOs, etc.	A report on circular bioeconomy and collaboration
	Set-up field demonstration
	Trained stakeholder, certificates prepared, participants assessed
Training for Uptake of ready to scale innovative business and financial models in RRR.	Catalogue of BMs ready Potential scaling partners identified.
	Demonstration sites set-up with field visits and training.
RRR school and youth programs	A report on Educational Participating Schools Circular bioeconomy knowledge
	A report on Participating tertiary departments

	Training methods established. Prepare conceptualization report on proposed activities for basic, secondary, and tertiary schools.
	Training materials/ logistics ready. Training schedule for participating schools prepared. At least 200 students and 1000 school children trained
Optimization studies of existing business model for uptake and scaling	Optimization areas identified - report Research questions developed.
	Internship reports
	Student thesis done (2BSc, 2MSc and 1PhD) with publications

	Demonstration site set up At least 1 uptake done
Develop new business model options in circular bioeconomy.	Preliminary feasibility study report
Develop new business model options in circular bioeconomy.	Detailed BMC is ready for uptake
Provide policy advisory and advocacy support	1. Key players/partners/stakeholders identified – 2. bottle necks Publish a review paper with recommendations
Create a virtual knowledge and learning forum/hub/platform/community	Virtual Knowledge hub/platform created 2. Launch event organized.

3. OPERATIONAL BUDGET (without staff time; first draft)

Sub – Components	Expected Output	Expected Cost (USD)	Remarks
Engage with stakeholders to co-own the hub	IWMIs contribution to the hub is established. Stakeholders' engagement done Co-conveners/owners of the hub identified and officially informed.	**1000**	
Develop training materials and provide technical and financial training to Professionals MMDAs staff, MSMEs, Industries, NGOs, etc.	Report on stakeholders/groups/ and their training needs	5000	
	Compiled list of existing relevant materials for the training & Prepare and Published new training resources - Training manuals, flyers, videos, posters, power point slides, etc.).		Hire Graphic designer and/or an animator, materials printing
	A report on circular bioeconomy SMEs for collaboration listed with brief on potential areas for collaboration and collaboration terms defined, drafted, and signed with circular bioeconomy businesses.	5000	Resources Required: Means of transport for staff, budget for certificates and transportation allowances for participants. For participatory workshop activities: Stationary, training tools (for teamwork, group discussions, that will allow simple 3d modeling), etc. For field training, the proposed activities are: Set up demonstration sites at existing living laboratories (starting with what we have i.e., the JVL-YKMA Recycling plant, Trimark, before getting more SMEs to be part of the hub). Demonstration fields activities will cover (depending on the location) - briquette production (carbonize and non – carbonized briquette), briquette from FS, windrow composting, Co-composting (incl. FS treatment), pelletizing, fabricate and showcase a simple locally made vacuum trucks for FS desludging, Fish & wastewater, wastewater & biogas, fish wastewater for greenhouse farming, developing food waste source separation program (within local context), wastewater treatment (Somanya) and agric reuse.
	Set-up field demonstrations		
	Trained Stakeholder, certificates prepared, participants assessment compiled		
Training for Uptake of ready to scale business and financial models in RRR.	Catalogue of business models ready for uptake Potential scaling partners identified.	2000	Means of transportation, graphic designers (to finalize uptake tool kits), materials and tools for demonstration site set-ups
	Demonstration sites set-up with field visits and training. At least 1 uptake program done		
RRR school and youth programs	A report with 1. Educational levels determined. 2. Participating Schools identified 3.Circular bioeconomy knowledge gap identified.		Means of transport for staff.

	A report with 1. Participating tertiary departments, research centers, student groups identified 2. Areas of collaboration established. Signed agreements		
	Training methods established. Prepare conceptualization report on proposed activities for basic, secondary, and tertiary schools.	15,000	Hire Graphic designer and/or an animator, materials printing costs means of transportation for staff and schools, materials for participatory works (stationary, white screen, beamer projector), tools for field demonstration/field work (different household/garden composter and compost platform to show various technologies, food waste/organic waste separation tools to showcase the mechanisms, etc.), buy mini laboratory kits for sampling and sample preservations from site (for student thesis), making home gardening kits for training, Tee shirts, trophies and medals for the quizzes and competitions, materials for food fair etc.
	Training materials and logistics ready Training schedule for participating schools prepared. At least 200 students and 1000 school children trained/exposed to RRR in 2023.		
Optimization studies of existing business model for uptake and scaling	Optimization areas identified - report Research questions developed.		Staff means of transport, budget for study tour.
	Internship reports	12,000	Staff means of transport, budget to support student research work.
	Student thesis done (at least 2BSc, 2MSc and 1 PhD) with publications.		
	Demonstration site set up - At least 1 uptake done		
Develop new business model options in circular bioeconomy.	Preliminary feasibility study report – IITA work on BSF linkages to the hub and the way forward.		Staff means of transport, Travel budget
	Detailed BMC is ready for uptake		
Provide policy advisory and advocacy support	1. Key players/partners/stakeholders identified - brief descriptions 2. bottle necks Publish a review paper or/and white paper on circular bioeconomy policy status, gaps with recommendations		On hold
Create a virtual knowledge and learning forum/hub/ platform/community	Virtual Knowledge hub/platform created with the various components - Library, discussion forum, data bank, gallery, etc. 2. Launch event organized. 3. Continue to run the site with a partner organization until total transition		
Total minimum operational budget without staff time*		**40,000**	

*Estimates are subject to updates when implementation starts