Feed the Future Innovation Lab for Small Scale Irrigation

SMALL SCALE IRRIGATION DIALOGUE SPACE:

Market and value chain approaches to farmer-led irrigation development

By Abena Ofosu
and
Thai Thi Minh

International Water Management Institute

June 2022

This Report is made possible by Feed the Future Innovation Lab for Small Scale Irrigation (ILSSI) through the U.S. Agency for International Development, under the terms of Agreement No. AID-OAA-A-13-00055. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development.

Contents

Introduction

Through the Feed the Future Innovation Laboratory for Small Scale Irrigation (ILSSI), the Small-Scale Irrigation Multi-Stakeholder Dialogue (SSI MSD) was established in 2019 as a unique strategy to bring stakeholders together to encourage collective thinking across sectors and explore new opportunities and solutions to scaling SSI in Ghana. This 5th SSI MSD meeting was organized by the International Water Management Institute (IWMI). The meeting provided an interactive learning and collaboration space for key stakeholders and actors in irrigated agricultural value chains to share experiences, insights, and solutions to farmer-led irrigation development (FLID) in Ghana and beyond. Specifically, it aimed to:

- Share experience on the use of market and value chain approaches for irrigation and agricultural development;
- Identify the barriers and opportunities for farmers investing in irrigation and across value chain actors in supporting FLID and the different roles actors can play; and
- Identify the potential for private sector investment in FLID and irrigated agricultural value chains.

The meeting was held on April 26th, 2022, at Coconut Grove Regency Hotel in Accra, Ghana. A total of sixty-six (66) invitations were sent via email to individuals representing government agencies and departments, development partners and donors, irrigation technology and equipment supply, private sector actors, research institutions and farmer organizations. Actual attendance was fifty-one (Annex 2) out of which fourteen joint virtually through Zoom (Figure 1). The highest attendance was from research organizations (25%). Development partners and donors attendance (20%) may indicate a growing interest from these partners in market and value chain approaches for promoting FLID. Farmer organizations formed 19% of the attendance, a significant improvement in attendance from previous multi-stakeholder dialogues, which followed a concerted effort to include more farmer organizations in discussions. The private sector and government agencies and departments constituted 14% each. Lowest attendance was recorded by irrigation technology and equipment suppliers at 8%, which may be attributed to other commitments held at the same time as this dialogue.

The meeting started with the welcome speech from Dr. Charity Osei-Amponsah, Regional Researcher - Social Transformation/Governance and Inclusion from IWMI Ghana. She mentioned that IWMI's core mandate is to provide innovative water solutions for sustainable development. IWMI, therefore, supports farmers, especially smallholders, to grow more food with less water. The multi-stakeholder dialogues are therefore one of many ways IWMI gathers ideas on how to improve farmer-led irrigation.

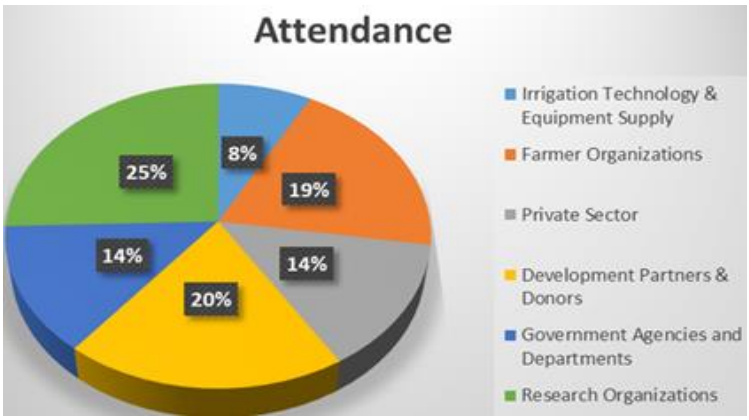

Figure 1: Different groups of attendees

Key highlights from presentations

The first presentation was from the IWMI describing the small scale irrigation (SSI) context in Ghana and the market and value chain approaches that may be explored for FLID. GIZ then highlighted its value chain development activities in North West of Ghana under the Market Oriented Agricultural Programme (MOAP). This was followed by a presentation from the Ministry of Food and Agriculture (MOFA) highlighting the prospects and challenges to SSI in Northern Region of Ghana, especially in the Sagnerigu District, the Northern Region. The final presentation highlighted the lessons learned from past and current value chain projects facilitated by the BENDA Group. Participants discussed ways to scale SSI using market and value chain approaches in four groups comprising three in-person groups and one online group. Finally, participants reflected on key messages from the meeting.

Value chain approaches and farmer-led irrigation development context in Ghana

The (irrigated) agricultural value chain includes the complex range of activities implemented by various actors to bring a raw material through a chain to the sale of the final product. It includes the input and irrigation, production, collection, processing, and distribution functions. The movement of a product or service along this chain may be facilitated or hindered by the enabling environment consisting of facilitating services, policy environment and embeddedness environment. In developing value chains, several approaches have been explored as depicted in Figure 2: the strong link approach, weak link approach, and whole chain approach.

FLID is key to the irrigated agricultural value chain in Ghana despite existing challenges. Common challenges include limited access to inputs and services including government support and subsidies and production challenges such as uncertain access to cultivated land, limited access to water, limited access to initial capital, and inappropriate irrigation practices. Others are limited post-harvest technologies, poor market bargaining power of farmers, and low collective marketing experience. Despite the existing challenges, FLID has immense potential for growth because of several factors. These include the local manufacture of irrigation equipment, growing awareness, and use of water-saving technologies, bundling technologies with financing models, interventions to process horticultural output for local and international markets, and high market demand for irrigated products. Local manufacture of irrigation equipment offers the opportunity to develop equipment suitable for the local needs of Ghanaian farmers and the climatic conditions. Interplast Limited, under the brand name InGreen, manufactures drip pipes and drip tapes for Ghana and for export within West Africa. Also, farmers are increasingly understanding the need to manage water for agricultural use due to erratic rainfall patterns and increasing droughts and floods. There is, therefore, growing interest in the use of soil moisture sensors, and drip and sprinkler systems to manage water for agricultural use. Additionally, the emergence of bundled services offers opportunities for developing FLID. Solar powered pumps bundled with PAYGO and PAYOWN financial services offer smallholder farmers opportunity to acquire solar technology at a flexible repayment rate. Further, interventions including the Ghana-Peri-Urban Commercial Vegetables Value Chains Project, GhanaVeg and Hortifresh interventions are adding value to vegetables for domestic

and international consumption. This minimizes post-harvest losses and increases market access for vegetable farmers. There is also high demand for irrigated products due to urbanization and growing health awareness among Ghanaians.

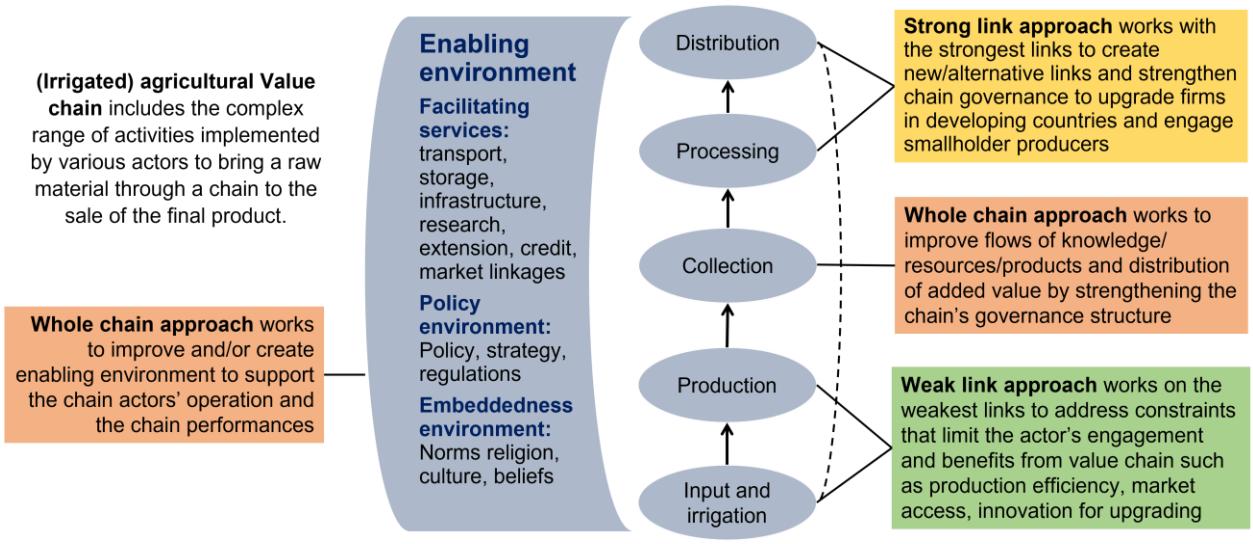

Figure 2: Different value chain approaches[1]

Some shortcomings are observed in the value chain approach to FLID. First, interventions focusing on market linkages in the irrigated agricultural value chain are few. Although several interventions have been undertaken by government and development partners to develop value chains, the irrigated value chain has not received as much attention as cash crops, cereals, tubers, and legumes. Second, interventions are often technology dominant. Interventions focus more on providing improved agricultural technologies, often giving lower priority to the social, cultural, and economic diversity of the beneficiaries that may affect the success of the technology adoption. Third, there is a lack of tailor-made products and service packages for irrigation. Irrigation equipment suppliers have over the years considered farmers as having similar needs, leading to the offering of one-size-fits-all products and service packages. Farmers, however, differ in land and water access, production and irrigation practices and financial capacity to afford improved technologies and services (farmer segments in Ghana). Fourth, there is lack of comprehensive interventions to address value chain dynamics and gender inclusion. Institutions in charge of agriculture lack adequate capacity to provide comprehensive support for synthesizing knowledge in the value chain for problem solving, team learning, performance improvement, value creation, and gender inclusion. Fifth, there is poor intervention coordination leading to duplication of effort. Project coordination between government and non-governmental organizations (NGOs) and between NGOs is uncommon in farmer-led irrigation development. Interventions, therefore, lack synergy, limiting impact on beneficiaries. Finally, the 'free-gift mentality' prevents farmer investments in irrigation. The NGO activity focused on agricultural development in northern Ghana in recent years may contribute to expectations for free inputs, in turn limiting farmer willingness to invest in irrigation equipment.

Agricultural Value Chain Development in North West Ghana

Agricultural value chains are socioeconomic systems that include all enterprises cooperating to serve a particular market. The enterprises forming the value chain interact constantly through buying and selling products and services, exchanging information, and cooperating to pursue shared interests. Improved efficiency in production is at the heart of value chain development. It is therefore critical to have reliable

[1] Abena Ofosu and Thai Thi Minh, ''An overview of market and value chain approaches and small scale irrigation context in Ghana", the 5th Meeting of Small Scale Irrigation Dialogue Space on 'Market and value chain approaches to farmer-led irrigation development', 26th April 2022

access to production services. The extreme weather conditions in the North West (Upper West, North East and Savannah Regions) of Ghana requires that alternatives need to be found to rainfed productions, which according to the presenter, will enable farmers to take advantage of the abundant water sources and good water table. The GIZ created MOAP considering gender issues, access to labour saving technology, certification schemes, quality planting materials, infrastructure for value chain development and inclusive business models. MOAP aims at enabling producers, processors, traders, and exporters to increase production, processing, trading, and exporting volumes. It also aims at adjusting the quality of primary and processed produce to suit national and/or international market requirements. MOAP also advises the Ministry of Food and Agriculture on the implementation of decentralized organizational reforms, improvement of service delivery, and private sector support. MOAP works in several value chains including vegetables. It forms part of the European Union Ghana Agriculture Programme: Productive Investment for Agriculture in Savannah Ecological Zones (11th EDF). The overall objective is to increase agricultural incomes, promote inclusive and sustainable economic growth in rural communities of the programme areas by 2025.

MOAP has five agricultural value chain development solution areas (Figure 3). Output A focuses on providing guidance for government policy on agriculture. Extensive knowledge of agriculture in the North East of Ghana offers valuable input into government development plans for the zone. Output B focuses on capacity building. Training is provided for Agriculture Extension Agents, staff of the Nation Builders' Corps, and staff of the Plant Protection and Regulatory Services Division to improve their service delivery to farmers. Output C focuses on promoting Good Agricultural Practices and providing certification for both farmers and producers. Smallholder farmers have been supported to obtain Ghana Green Label certification. This includes training on crop pests and diseases, safe use of pesticides, soil and water management, and the proper post-harvest handling of agricultural produce. Output D supports inclusive business models and services. It supports women and youth farmers by linking them to buyers. Output E aims at supporting common interest groups such as farmer-based organizations and community groups. This includes linking women to Village Savings and Loans groups.

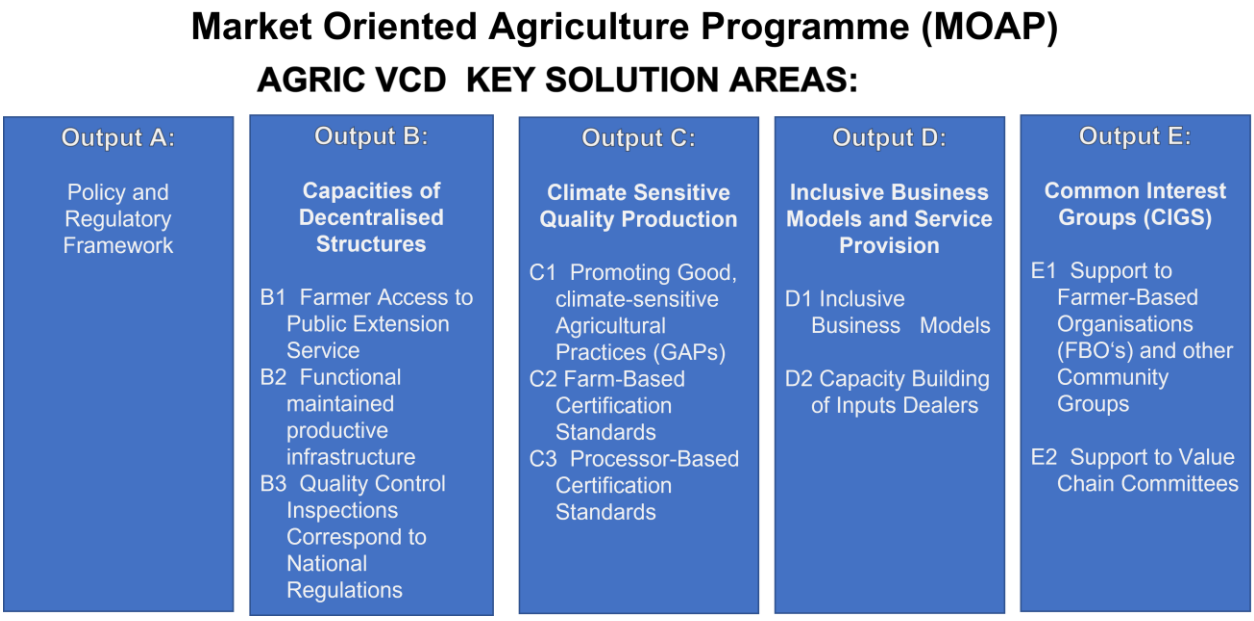

Figure 3: MOAP Agriculture Value Chain Development key solution areas

Small Scale Irrigation Development in Northern Region: Prospects and Challenges

The Northern Region of Ghana is known for both formal and informal irrigation due to the unimodal rainfall pattern and the 6-7 months of dry season in the year. There are three main formal irrigation sites, namely Golinga, Libga, and Bontanga, reaching a total number of 12,340 farmers[2]. Formal irrigable land in Northern Region is estimated to be 915 hectares while informal irrigation is estimated to cover 241 hectares. FLID in Northern Region is characterized by individual planning and selection of fields by ownership. There is no formal coordination of field activities. Seeds and other inputs are mostly purchased from unapproved sellers or reserved from previous harvest. Buckets and jerricans are the main methods of obtaining and applying water, with few households also using motor pumps or manual pumps.

Government has made efforts to support irrigated agriculture through the One Village One Dam Program and the Planting for Food and Jobs Program. The One Village One Dam Program (1V1D) which started in 2019 in the Northern Region aims to secure water supply for irrigation to increase agricultural productivity during the dry season (Picture 1). There is a total of 307 1V1D dams in northern Ghana, managed by community chiefs, chairmen, and the assemblymen. Although benefiting from the dam is for all who are interested, women tend to patronize these dams more than men for drinking, subsistence farming and domestic purposes. Some dams in the region are shallow and poorly constructed leading to regular de-silting. Some 1V1D dams for instance dry up a few months into the dry season due to poor construction.

Picture 1: A 1V1D Dam[1]

The Planting for Food and Jobs Program (PFJ) started in 2017 with the aim of increasing farmer access to fertilizers and seeds. Vegetable seeds and fertilizer subsidy is one activity under this program. Beneficiaries may sign unto the program by registering with their Agricultural Extension Agent (AEA). Registration data is captured electronically using phones as well as on paper with their IDs or Ghana card. The program targets allocation of 60% to women farmers. The program focuses on farmer access subsidized seeds and fertilizers in the main cropping season, i.e. for rainfed or rainy season production. The Planting for Food and Jobs program has increased interest in farming despite existing challenges. Some challenges include the low ability of smallholder farmers to buy inputs for dry season farming as a result of lack of cash or unavailability of inputs, especially fertilizers. Smuggling and hoarding of subsidized fertilizer has also posed availability issues. Government delay in payment of suppliers has further reduced the willingness of suppliers to supply inputs readily.

Experiences with irrigation development in the Northern Region have led to some observations. With the absence of storage facilities for highly perishable fruits and vegetables short and shelf life of produce, post-harvest losses are high, which further reduces farmer profits and incomes. Water conveyance is a challenge, especially for women farmers. Farmers with plots a distance from surface water sources lack resources to invest in pipes to convey water to plots and therefore, use watering cans or jerry cans which limit the area they can effectively irrigate. Watering using water cans is tedious, especially for women farmers. Some farmers lose their irrigated crops to untethered livestock, such as goats, cattle, and pigs. However, wild animals may also destroy farms. Unregulated sand winning along riverbanks poses challenges for agriculture, because it hampers the flow of some rivers used for irrigation and increases flooding. Land tenure systems may hamper investment in irrigation, as the Northern Region is governed

[2] Ministry of Food and Agriculture Reports in Shani Abukari Aduwa, ''Small-scale irrigation development in Northern Region: Prospects and challenges", the 5th Meeting of Small Scale Irrigation Dialogue Space on 'Market and value chain approaches to farmer-led irrigation development', 26th April 2022

by a complex land tenure system with multiple customary authorities, including both chiefs and traditional spiritual heads, that exert some control over the use of land by farmers.

Interventions are mainly focused on production. Several interventions to develop irrigation focus on increasing production, instead of holistic development of irrigated value chains, especially creating market linkages to support the increased output. The Ministry of Food and Agriculture is making efforts to create market linkages. The Department organizes periodic community markets for vegetable sellers to trade with buyers from Togo and Burkina Faso, especially for green leafy vegetables. These markets are seasonal and depend on yields of green leafy vegetables harvested in Togo and Burkina Faso. Traders travel to border villages in Ghana to buy green leafy vegetables from these local markets when yields in those two countries are low. The barter system is sometimes used during these markets, making the exchange of value difficult to determine.

To maximize potential for irrigation in the Northern Region, **capacity building for the irrigation system must be prioritized.** According to this presenter's opinion, GIDA must be empowered to exercise absolute control over irrigation land, while government authorities collaborate with relevant stakeholders to develop effective programs for building the capacity of contractors involved in the development of publicly invested irrigation scheme infrastructure. Government should convert diesel and electric pumps to solar, while enforcing sanctions for sand winning at riverbanks. Government should also focus on **developing the irrigated agricultural value chain.** This should include improving access to credit or alternative financial schemes, government subsidizing prices of water pumps, enhancing the maintenance culture, and promotion vegetables with long shelf lives. Further, **FLI must be developed.** This includes formalization of informal small-scale farmers, capacity building for Agricultural Extension Agents to offer support for dry season farming, soliciting the views of multi-stakeholders in communities to solve local challenges, and investment into storage facilities to support irrigated vegetable production.

Market and Value Chain Approaches to Scaling Small Scale Irrigation

The Benda Services Group has vast experience working on value chain projects in Ghana. Services offered include research, project design and management, design of irrigation schemes, value chain facilitation, and data management and extension services. **Value chain analysis** is conducted to identify the strengths, weaknesses, opportunities, and threats (SWOT) of a project. The project implementer must utilize the strengths to capitalize on the existing opportunities to ensure successful scaling up. Weaknesses identified must be strengthened to enhance project resilience while structures are established to minimize the effects of possible threats. Some key lessons have been learned from past and current projects for doing value chain analysis as shown in Figure 4.

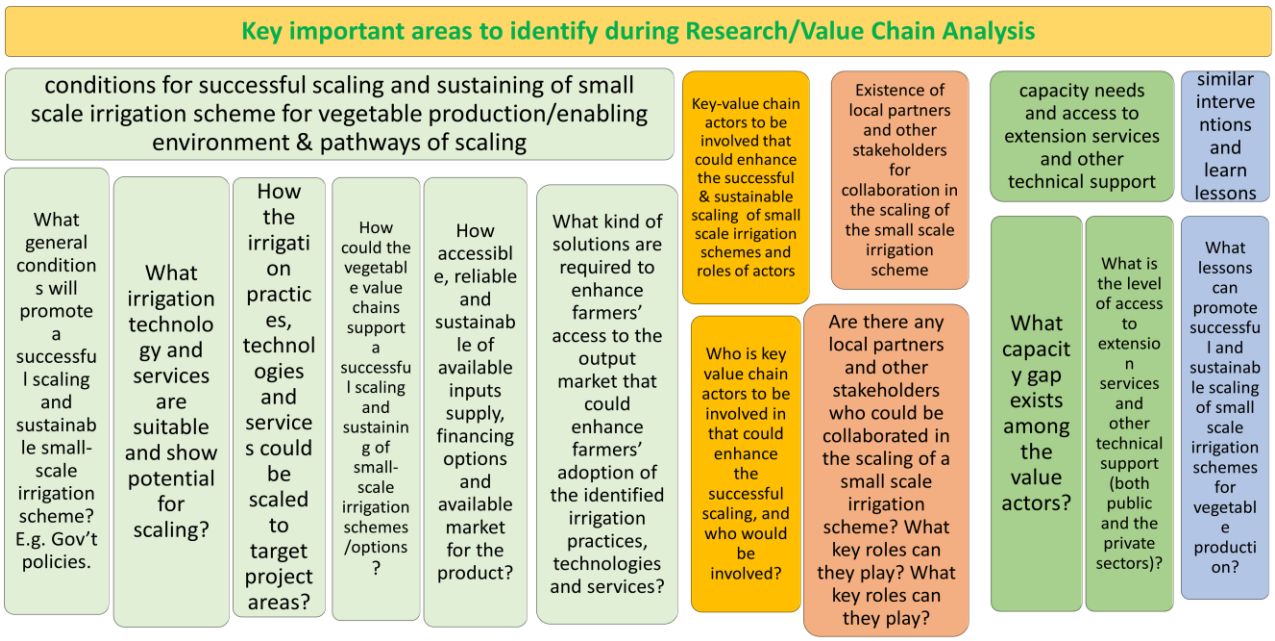

Figure 4: Key areas to identify during value chain analysis[3]

Successful SSI scaling of requires effective project design and management, stakeholder networking, financing, and maintenance of an enabling environment to support SSI as shown in Figure 5 below:

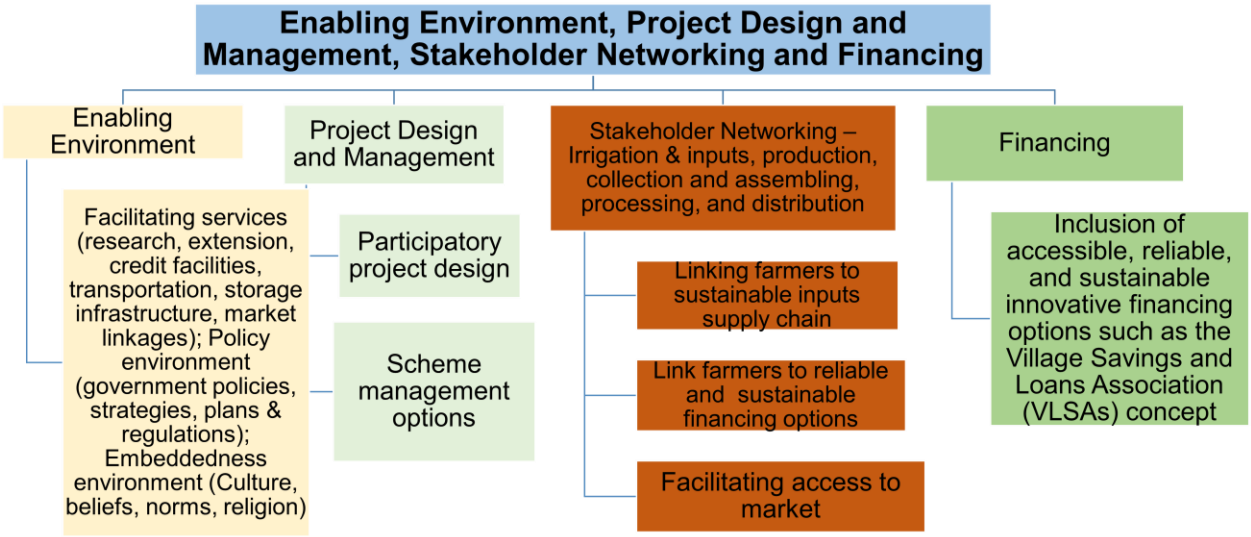

Figure 5: Factors for successful scaling of SSI[4]

In scaling SSI, there is the need to have a sustainability strategy. This strategy should consider the existing national and local government policies, strategies, and plans. This will help in identifying opportunities for collaboration within the existing structures. Capacity building of value chain actors and facilitation of value chain linkages and formal agreements should also be explored. Active effort to promote gender and youth inclusion will also make scaling more effective.

[3] Benjamin Edusah," Market and Value Chain Approaches to Scaling Small Scale Irrigation: Lessons learnt", the 5th Meeting of Small Scale Irrigation Dialogue Space on 'Market and value chain approaches to farmer-led irrigation development', 26th April 2022

[4] Ibid.

Reflecting on market and value chain approaches to scaling farmer-led irrigation development

Participants were divided into four groups, comprising three in-person groups and one online group to discuss different approaches for scaling SSI using market and value chain approaches. Participants first identified interventions in their areas applying market and/ or value chain approaches to irrigation development. These include the Centre for Indigenous Knowledge and Organizational Development (CIKOD); Green People's Energy Project and Market Oriented Agriculture Project in North Western Ghana (MOAP NW) implemented by GIZ; Hortifresh Project implemented by SNV; as well as the Youth Empowerment Synergy (YES Ghana) Project and the Northern Ghana Governance Activity implemented by SEND Ghana, Action Aid and Care International. Government interventions mentioned include the activities of the Ministry of Food and Agriculture (MOFA) to link green leafy vegetable farmers to markets in Togo and Burkina Faso, the Planting for Food and Jobs Initiative and the Okyereko Irrigation Scheme managed by the Ghana Irrigation Development Authority in the Central Region of Ghana.

Reflecting on how market and value chain approaches may be applied to support FLID, participants made several suggestions. First, efforts should be made to link agro-input dealers to irrigation farmers. Improved access to information will help farmers apply the right chemicals to their products, increasing their output and access to local and international markets. Some farmers are currently unable to access major international markets due to excessive application of agro-inputs. Second, private sector participation in extension services and technical advisory services should be supported. The government should explore the use of private sector companies such as Pumptech and off-takers to provide extension services and technical advice on the use of improved technologies and modernized agriculture. Farmer field demonstrations, for instance, may be used to compare the performance of motorized pumps with solar pumps over a period of time to demonstrate long-term efficiency. Third, more effort should be made to link farmers to off-takers. Farmers currently have little market power due to limited information on how to reach off-takers for their output. This affects their ability to negotiate fair prices for their output, limiting their incomes from irrigated agriculture. Finally, interventions should be designed to be more holistic. Several interventions focus on providing improved technology or developing one aspect of the value chain, leading to poor market linkages.

Participants also reflected on the opportunities across value chain actors to support small-scale farmers in irrigation and the roles that these actors can play. Pumptech, MOAP and government may introduce farmers to solar pumps suitable for small scale production that are within the financial capacity of farmers to afford. As production increases, farmers may be introduced to higher capacity versions of the technology. Interventions from MOAP, CIKOD and other organizations offer opportunities for smallholders to gain access to irrigation facilities and training on packaging, labelling and successful management of agro-businesses. Development organizations, especially GIZ, help to create market linkages through free agro-exhibitions organized periodically. The Women in Agricultural Development Directorate (WIAD) of the Ministry of Food and Agriculture offer the opportunity for discussing and finding solutions to women-specific challenges in agriculture.

Participants perceive the potential for private sector investment in FLI and the irrigated agricultural value chain to be high in relation to opportunities to partner with NGOs, out-growers, government agencies, farmer-based organizations and community-based organizations and to create synergies. It was generally agreed that holistic interventions that go beyond technology promotion will achieve a greater impact on farmers and other value chain actors. Additionally, multi-stakeholder collaboration will ensure significant development of the entire irrigated agricultural value chain.

Annex 1. The meeting agenda

AGENDA

Small Scale Irrigation Multi-Stakeholder Dialogues:
Market and value chain approaches to scaling farmer-led irrigation development

Venue: **Coconut Grove Hotel, Accra**

Time: 8.30 – 13.30 on **26th April 2022**

Objectives:

- Share experience on the use of market and value chain approaches for farmer-led irrigation development (FLID) and agricultural development;
- Identify the barriers and opportunities for farmers investing in irrigation and the across value chain actors in supporting FLID and the roles that they can play; and
- Identify the potential for private sector investment in FLID and irrigated agricultural value chain.

Time	Activity	Remarks
08.30 – 09.00	Registration	
09.00 – 09.15	Welcome by IWMI and ILSSI	Charity Osei-Amponsah
	SSI Development in Ghana	
09.15 – 09.30	An overview of market and value chain approaches and small-scale irrigation context in Ghana	Abena Ofosu
	Presentations (15 minutes each)	
09.35 – 09.50	GIZ: Agricultural value chain development in North West Ghana	Zakaria Issahaku
09.55 – 10.10	MOFA: SSI in Northern Region –Prospects and Challenges	Shani Abukari Aduwa
10.15 – 10.35	**Coffee Break**	
10.40 – 10.50	Introduction and instruction for the breakout group discussion	Abena Ofosu
10.55 – 11.55	Breakout discussion **Questions:** 1. What factors influence the formation of strong market linkages in the irrigated agricultural value chain? 2. How can market and value chain approaches be applied to support FLID? 3. What are the opportunities across the value chain actors in supporting small-scale farmers in investing in irrigation and the roles that they can play? (Including financing mechanisms) 4. What is the potential for private sector investment in farmer-led irrigation and irrigated agricultural value chain? (Including financing mechanisms)	All participants (5-6 groups)
12.00 – 12.15	**Reflection:** Key messages have come out from the meeting	
12.15 – 12.30	Meeting closure	
12.30 – 13.30	Lunch and networking	

Annex 2. List of participants

No		Organization
In-person participation		
1		Bihee Women Group
2		Blue Deal White Volta
3		Bolga WIAD
4		CSIR-WRI
5		DENG Solar limited
6		Department of Agric-Sagnarigu
7		Department of Agriculture
8		Dizengoff
9		Farm Radio International
10		Farmer
11		Farmer
12		Farmer
13		Farmer
14		Farmer
15		Farmer
16		GCAP-MOFA
17		IFDC
18		IFDC
19		International Trade Carte
20		Interplast
21		Irrigation Development Authority
22		IWMI
23		IWMI
24		IWMI
25		IWMI
26		IWMI
27		IWMI
28		IWMI
29		IWMI
30		MEDA
31		Namoo Ltd
32		Tech-2 Resources limited
33		Tunteiya Women Group
34		World Vision
35		World Vision
36		Wuni mi Youth Association
37		Yuoenu Company Limited
Virtual participation		
38		BENDA Group
39		GIZ
40		GIZ
41		GIZ
42		IWMI
43		IWMI
44		IWMI
45		IWMI
46		IWMI
47		Power Off Grid Africa

48		Pumptech
49		Texas A&M University
50		White Volta Basin Secretariat
51		WUZDA Ghana