



Strengthening Policy Advocacy for the Productive Use of Solar Energy (PUSE) in Agricultural Value Chain in Nakaseke, Kiboga, Nakasongola, Luwero, Wakiso, and Kamuli



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EXECUTIVE SUMMARY

This Capacity Needs Assessment (CNA) examined the institutional, technical, financial, and policy advocacy capacities of 15 Civil Society Organisations (CSOs), cooperatives, NGOs, extension actors, and farmer groups engaged in the Productive Use of Solar Energy (PUSE) across Nakaseke, Kiboga, Nakasongola, Luwero, Wakiso, and Kamuli districts. Conducted under the Distributed Renewable Energy Ecosystem Model (DREEM) Hub Project, the assessment aimed to identify capacity gaps and opportunities to strengthen the ability of these actors to effectively promote, implement, and advocate for PUSE within agricultural value chains.

The findings reveal that while organisations play an important role in farmer mobilization, climate-smart agriculture, and value chain support, their ability to scale PUSE interventions remains constrained by capacity gaps. Institutional capacity is generally moderate, but weakened by inadequate operational policies, limited strategic planning, and weak financial management systems. Technical capacity in solar energy applications, particularly in irrigation, agro-processing, and cold storage, is low, limiting effective implementation and sustainability of interventions. Policy advocacy capacity is especially weak, with limited participation in policy processes, a lack of structured advocacy strategies, and insufficient use of evidence to influence decision-making. In addition, financial barriers, including the high cost of solar technologies and limited access to tailored financing mechanisms, hinder adoption among farmer groups. Coordination across the PUSE ecosystem is also fragmented, reducing synergies among CSOs, cooperative societies, government entities, and other private sector actors.

Despite these challenges, the assessment highlights strong opportunities for scaling PUSE, supported by an enabling policy environment, increasing demand for climate-smart agricultural solutions, and emerging opportunities for private sector engagement and value chain development. To address these gaps and unlock the full potential of PUSE, the report recommends a comprehensive and integrated capacity strengthening approach. This includes strengthening institutional systems through improved governance, strategic planning, and financial management; building technical capacity in solar technologies across the value chain; and enhancing policy advocacy through structured strategies, evidence generation, and increased participation in policy platforms.

The report emphasizes the need to strengthen multi-stakeholder coordination and partnerships, particularly with government, solar energy companies, and financial institutions, to improve service delivery and resource mobilization. Finally, the report underscores the importance of integrating PUSE into district and national planning processes, strengthening data systems for evidence-based decision-making, and aligning interventions with broader agricultural, climate, and rural development frameworks. Overall, the CNA demonstrates that scaling the productive use of solar energy in agriculture requires more than technology deployment. It calls for deliberate investment in institutional strengthening, technical skills, policy influence, financing, and coordinated action among stakeholders to create a sustainable and enabling ecosystem for PUSE in the districts of study.

1. INTRODUCTION

The concept of Productive Use of Solar Energy (PUSE) refers to the application of renewable energy technologies to enhance economic activities within agricultural value chains. In many parts of Uganda, access to reliable and affordable renewable energy remains a major constraint in rural agricultural development in the districts of Nakaseke, Kiboga, Nakasongola, Luwero, Wakiso, and Kamuli. Solar energy technologies offer significant potential to improve agricultural productivity, reduce post-harvest losses, facilitate transportation and delivery of products and services, and increase rural incomes through applications such as solar irrigation, solar drying, solar cooling and cold storage, solar-powered agro-processing, transportation, and solar-powered rural enterprises.

Despite growing awareness of solar technologies, their adoption remains limited due to institutional capacity gaps, financial constraints, and weak policy engagement among rural development actors. Therefore, civil society organizations, cooperatives, and farmer groups have a role to play in mobilizing farmers, demonstrating technologies, facilitating market linkages, and advocating for supportive policy environments. However, many organizations lack the capacity required to promote PUSE at scale effectively.

2. RATIONALE OF THE CAPACITY NEEDS ASSESSMENT

There is high potential for solar energy to transform agriculture, but its adoption is constrained by significant institutional, technical, financial, and policy capacity gaps among key actors. Although solar technologies have strong potential, adoption remains limited in the agricultural sector due to a lack of technical capacities and skills, limited awareness, and deeper systemic issues. It was therefore necessary to understand why uptake is still low and what is preventing the scaling of PUSE interventions. The CNA was undertaken to identify these gaps, including policy advocacy skills.

3. OBJECTIVES OF THE CAPACITY NEEDS ASSESSMENT

The overall objective was to identify institutional strengths, capacity gaps, and opportunities to strengthen CSOs, cooperatives, and farmer groups to effectively engage in PUSE policy work and implementation. The specific objectives were:

1. Assess the institutional, technical, advocacy, and project management capacities of CSOs and farmer groups engaged in PUSE initiatives.
2. Determine institutional, technical, financial, policy advocacy, and coordination weaknesses limiting effective promotion of PUSE interventions.
3. Analyze external opportunities and enabling factors supporting PUSE scaling.
4. Propose strategic capacity strengthening interventions to enhance policy advocacy

and implementation.

4. METHODOLOGY

The assessment employed a mixed-methods research approach combining qualitative and quantitative techniques. These included:

1. Desk review of policy frameworks that included the Climate Change Policy (2015), National Irrigation Policy (2018), National Organic Agriculture Policy (2020), Energy Policy (2023), Energy Transition Plan (2023), Third Strategic Plan (ASSP III 2018), Green Manufacturing Strategy (2021 – 2025), Updated NDCs (2022), and the Electricity Amendment Act (2022).
2. The review of documents also included organizational document such as the project design document on “Strengthening the productive use of solar energy services in agricultural value chains in Uganda-Phase II. This document informed the study about the intentions of the project.
3. Key Informant Interviews with CSO leaders, on PUSE experiences and barriers. The respondents emphasized that while PUSE initiatives have created important awareness and local engagement, greater coordination, sustained financing, policy advocacy support, and community empowerment are needed for lasting impact.
4. A structured questionnaire was administered to participating organizations. A detailed capacity assessment questionnaire was administered to the 15 organizations covering governance issues, financial management approaches, technical expertise in solar technologies, policy advocacy experiences, project management capacity and gender and social inclusion considerations.

The 15 organizations were drawn from six districts of Nakaseke, Kiboga, Nakasongola, Luwero, Wakiso. These were Kalyabulo Dairy Farmers Cooperative, Nakaseke District Local Government, Kalyabulo Cooperatives, Kiboga District Farmers Association, World Vision in Nakasongola, Strategies for International Development, Kamuli District Farmers Association, Nakaseke District Local Government, Migani Cooperatives, and Caritas. These are mainly cooperatives, CSOs, and Farmer Groups focusing on the use of PUSE in irrigation and solar-cooling systems. Quantitative data were analyzed using descriptive statistics, while qualitative data were analysed through thematic analysis to identify institutional strengths, capacity gaps, and opportunities.

5. THEORY OF CHANGE LINKING OUTCOMES AND IMPACTS

The study examined the extent to which CSOs, cooperatives, and farmer groups are involved in promoting the Productive Use of Solar Energy (PUSE) and the use of theories of change and logic models that guide interventions within PUSE value chains.

The assessment explored whether organizations have clear frameworks linking activities, outputs, outcomes, and long-term impacts related to PUSE adoption, policy advocacy, climate resilience, and livelihood improvement.

The assessment revealed that while several CSOs implement relevant activities in PUSE, many lack clearly articulated theories of change and comprehensive logic models specifically tailored to PUSE interventions. In many cases, activities are implemented in a project-based manner with limited integration of long-term advocacy, systems thinking, stakeholder coordination, and evidence-based learning frameworks.

If CSOs, farmer organizations, local governments, and private sector actors were equipped with advocacy skills, financing access, and collaborative platforms, then they would be better able to influence policy and increase the adoption of solar-powered technologies.

6. THE FINDINGS AND RELATED IMPLICATIONS

OBJECTIVE 1: Assessment of the capacities of cooperatives and CSOs, engaged in PUSE.

This assessment was intended to profile the assessed organization, institutional governance capacity, and technical capacity for PUSE implementation, policy advocacy, and staff skills capacity. Here are the findings:

a. Profile of assessed organisations

The assessment targeted 15 organisations operating across six districts, but only 12 responded to the Capacity Needs Assessment tool (see Table 1 below).

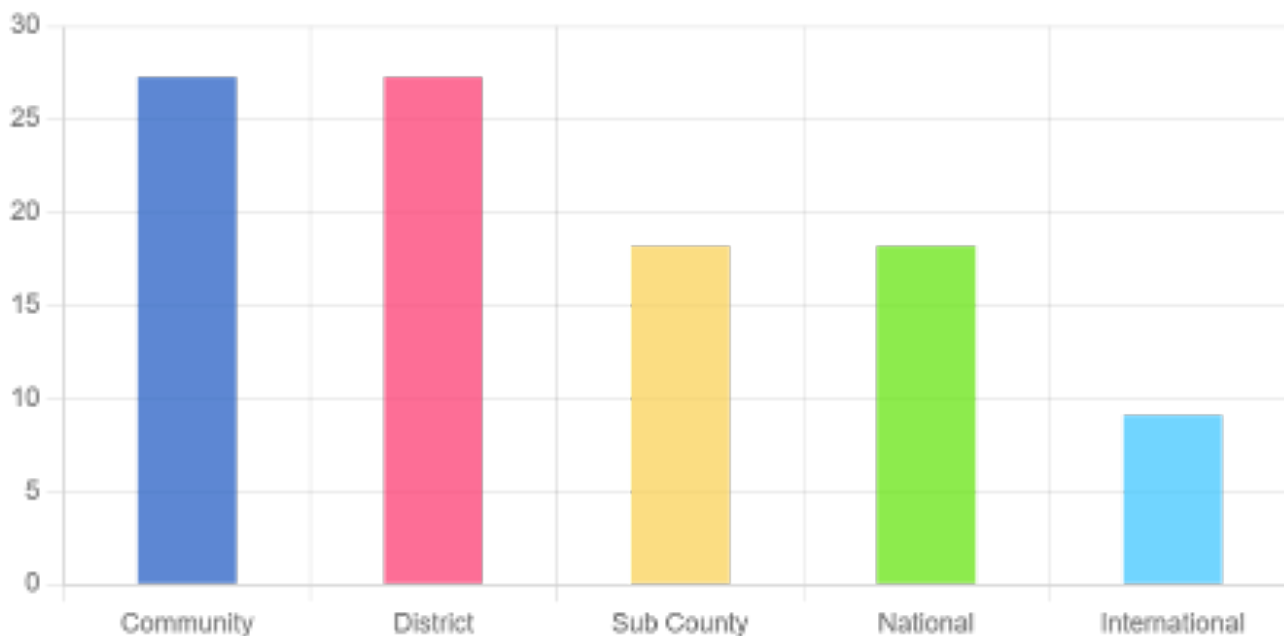
Table 1: Targeted organisation by district

District	Number of organisations
Nakaseke	3
Kiboga	2
Nakasongola	3
Luwero	3
Wakiso	2
Kamuli	2

The assessment covered a mix of organisations, including CSOs/NGOs (40%), cooperative organisations (33%), Farmer groups (20%), and social enterprises (7%). These organisations carry out their operations at international (1 organisation), national (2 organisations), district (3 organisations), sub-county (2 organisations), and community level engagements (3 organisations) (see Figure 1). They are registered within the District Local Government or the Uganda Registration Services Bureau. They operate at community and district levels, focusing on farmer mobilisation, agricultural training, value chain support, and climate-

smart agriculture initiatives. The value chains are mainly coffee, maize, dairy, horticulture, and poultry.

Figure 1: Operational area of the organisations



b. Institutional governance capacity

Most organisations have basic governance structures.

Table 2: Institutional governance capacity

Indicator	Capacity Level
Governing board	60%
Strategic plans	53%
Operational policies	40%
Gender policies	35%

The capacity needs assessment reveals notable gaps in institutional capacity across several core areas. While 60% of organisations reported having a governing board and 53% indicated the existence of strategic plans, the effectiveness of these structures appears limited. Only 40% have operational policies in place, and an even smaller proportion (35%) have established gender policies.

Details of the findings are that:

1. These organizations are small and are found in rural settings, and have established governance structures, including Boards of Directors, management committees, and advisory bodies. However, the level of functionality varied significantly across institutions.
2. These boards are partially functional, with irregular meetings, limited strategic oversight, and weak follow-up on resolutions and action points.
3. Some board members lack adequate orientation and understanding of their

governance roles, particularly in areas of policy guidance, resource mobilization, and institutional sustainability.

4. The lack of funds, hence, limit the ability of boards to meet regularly and effectively supervise institutional activities.
5. They lack updated governance policies, strategic plans, and monitoring frameworks to guide board operations and institutional performance.
6. Some institutions demonstrated strong governance practices, including active boards, clear leadership structures, regular reporting systems, and effective stakeholder engagement.
7. Respondents emphasized the need for capacity strengthening in institutional governance, including board training, leadership development, strategic planning, and governance compliance.

These findings point to weak strategic planning processes, where existing plans are not robust, actionable, or aligned with emerging priorities such as renewable energy. In addition, there are limited internal governance systems, suggesting that oversight, accountability, and policy frameworks are either underdeveloped or not fully functional. There is weak integration of renewable energy into organisational strategies, indicating that despite its growing importance, it has not yet been embedded into planning and decision-making processes.

c. Financial and administrative capacity

Only a few organisations have robust financial systems.

Table 3: Financial and administrative capacity

Indicator	Percentage
Computerised financial systems	40%
Audited financial statements	33%
Donor fund management experience	47%

The capacity needs assessment highlights significant gaps in financial and administrative capacity. Only 40% reported having computerised financial systems, while just 33% have audited financial statements, pointing to weaknesses in financial accountability and reporting structures. Although 47% indicated some experience in managing donor funds, this experience is not yet widespread or sufficiently institutionalised.

These findings underscore broader financial constraints that limit organisational effectiveness. These include limited access to grants, which restricts the ability to initiate and scale projects, as well as weak financial management systems, which affect transparency, efficiency, and donor confidence. The lack of revolving funds for solar technologies further constrains the adoption and sustainability of renewable energy solutions, particularly for end users such as farmers.

d. Technical capacity for PUSE implementation

Technical expertise in solar technologies is generally low to moderate.

Table 4: Technical capacity for PUSE

PUSE Application	Capacity Level
Solar irrigation	Low
Solar agro-processing	Low
Solar drying	Moderate
Solar cold storage	Very low
Solar-powered enterprises	Moderate

The CAN indicates low technical capacity for PUSE implementation across most focus areas. Competency in solar irrigation and solar agro-processing is rated as low, while solar cold storage is identified as very low, highlighting critical gaps in more advanced and capital-intensive technologies. Solar drying and solar-powered enterprises show relatively better performance, with moderate levels of capacity, though these remain insufficient for large-scale or sustained implementation.

There is limited expertise in system design and installation, which affects the quality and sustainability of deployed technologies. Weak capacity in operation and maintenance undermines the long-term functionality and efficiency of systems. There is also a clear need for enhanced farmer training on solar technology use, as end users often lack the knowledge required to effectively operate and manage these solutions. Value chain integration remains underdeveloped, limiting the ability to link energy technologies with productive economic activities.

e. Policy advocacy capacity

The study assessed stakeholders' knowledge and understanding of policies related to the Productive Use of Solar Energy (PUSE), including broader energy, agriculture, climate change, and rural development policy frameworks. Attention was given to awareness of PUSE-specific policies, strategies, and regulatory provisions relevant to agricultural value chains.

In addition, the study examined stakeholders' understanding of government planning and budgeting processes at both district and national levels, including opportunities for participation, advocacy, and policy engagement. This assessment was important in determining the capacity of CSOs, farmer organizations, local leaders, and community actors to effectively influence policy implementation, resource allocation, and decision-making processes related to PUSE interventions.

The findings presented below reflect both the level of policy awareness and the extent of stakeholder engagement in planning, budgeting, and advocacy processes. Policy engagement remains one of the weakest capacity areas.

Table 5: Policy advocacy capacity

Indicator	Percentage
Participation in policy dialogue	20%
Advocacy strategy	13%
Policy analysis capacity	15%

The CAN reveals limited policy advocacy capacity for PUSE implementation. While 50% reported participating in policy dialogue, only 13% have a defined advocacy strategy, and 37% demonstrate capacity in policy analysis. This suggests that although some organisations are engaged in policy discussions, their involvement is informal, inconsistent, and not guided by structured approaches.

These findings highlight several key barriers. There is a limited understanding of policy processes, which constrains effective engagement and influence. There is weak research and evidence generation capacity that reduce the ability to inform policy positions with credible data and information. Organizations face limited access to policy and advocacy engagement platforms, restricting opportunities to contribute to decision-making processes. Limited engagement with district planning cycles undermines the integration of PUSE priorities into local development plans.

f. Staff with skills in PUSE

An assessment of staff skills for PUSE in the organisation was carried out, depicting very low skills for policy, advocacy and communications.

Table 6: Staff with skills in PUSE

Skills	Frequency
Climate change, environmental management	10
Agricultural energy integration	8
Planning and budgeting	3
Policy, Advocacy and Communication	3

The assessment reveals important insights about organisational capacity. The relatively higher scores in climate change and environmental management (10) and agricultural energy integration (8) show that organisations are technically grounded. Staff understand the link between solar energy, climate resilience, and agriculture. There is a solid foundation for implementing field-based, practical interventions such as solar irrigation and sustainable farming practices.

For the moderate to weak planning capacity exemplified by planning and budgeting (3), which scored quite low. This suggests that there is limited ability to translate ideas into planned, structured, costed, and scalable programmes, and this might cause challenges in integrating PUSE into formal organisational or district plans. Even with good technical ideas, implementation may be inconsistent or underfunded.

Policy, advocacy, and communication (3) is among the lowest scores. This is a major concern because organizations struggle to influence district or national policies on solar energy. Limited advocacy reduces visibility and support for PUSE initiatives. Weak communication

affects knowledge sharing, community awareness, and stakeholder engagement. Therefore, good work on the ground may not translate into broader impact or systemic change.

The results show a clear imbalance, stronger in implementation (technical areas) and weaker in enabling functions (planning, advocacy, communication). Organisations may succeed in small-scale projects but face difficulties in scaling up interventions, attracting funding, and, let alone, influencing policy environments.

The findings highlight urgent areas for capacity strengthening, especially on policy engagement and advocacy skills, communication and knowledge dissemination and planning and budgeting for PUSE projects.

g. Understanding of PUSE

Respondents were assessed on the understanding of PUSE and they gave different views on the way they understand the meaning of productive use of energy. The responses have been grouped into 4 categories:

- i. The definitions of solar energy capacity and technical use: Here, they gave a response that relates to the capacity of using (but also effectively and efficient way to trap) energy derived from the sun.
- ii. Efficient and everyday use of solar energy to power homes, use it in agriculture to power irrigation, cooling systems and general applications in industrialization.
- iii. Two organisations understand solar energy in terms of economic use and income generation, harnessing solar energy for essential services, and improving livelihoods, generating income beyond home use and leveraging solar energy for income-generating activities rather than residential use only.
- iv. The last category relates to using solar energy to speed up and accelerate production processes, for example, using solar to pump water and irrigate plants, using solar energy in agricultural production and dairy farming.

h. PUSE technologies awareness

Respondents were asked which PUSE technology they were familiar with. Eighty two percent (82) were familiar with solar irrigation, 72% were familiar with cooling technologies, 36% were familiar with processing technologies, while 18% were familiar with solar energy use in the transport sector (boda boda use).

Table 7: PUSE technologies that organisations are familiar with

PUSE technology	Frequency	Percentage
Solar Irrigation	9	81.82
Cooling	8	72.73
Processing	4	36.36
Transport	2	18.18

For solar irrigation, solar energy powers water pumps (solar-powered pumps) to draw water from wells, rivers, or boreholes for irrigation. It helps farmers irrigate crops without relying

on fuel or grid electricity. It enables irrigation even in remote areas, reducing costs and supporting year-round farming.

For cooling, solar energy is used to power cooling systems such as refrigerators, cold rooms, and fans. Solar energy preserves perishable goods like milk, fish, fruits, and vegetables, reduces post-harvest losses, and solar-powered cold storage is especially useful in off-grid rural areas.

For processing, solar energy runs machines used to process agricultural or other products. This is when it powers equipment like grain mills, oil presses, milk chillers, and dryers. It is also used in solar dryers that are used to dry crops (e.g., coffee, maize, fish, fruits), and it improves product quality and adds value before selling.

For transport, solar energy supports transport indirectly and directly, charging electric motorcycles, powering refrigeration in transport, and, in isolated cases, supporting charging stations in off-grid areas.

i. Experience managing energy or climate-related funding

The study assessed stakeholders' experience in accessing, managing, and implementing energy- and climate-related funding opportunities linked to the Productive Use of Solar Energy (PUSE) in agricultural value chains. This included examining the capacity of CSOs, cooperatives, farmer organizations, local governments, and community groups to mobilize, manage, account for, and utilize financial resources for PUSE-related interventions. Attention was given to experience with project planning, financial management, donor compliance requirements, proposal development, and implementation of energy, climate resilience, and sustainable agriculture initiatives. The CNA also explored challenges affecting access to funding, institutional readiness, and the ability of stakeholders to sustain PUSE initiatives beyond project-based support.

Some respondents indicated that their experience is guided by organisational leadership, noting that they rely on direction from senior management when handling funds. Several participants described their experience as low or somewhat limited, while others rated themselves as having moderate experience, particularly where they had previously engaged with donor-funded projects.

Respondents reported no direct experience with climate-specific funding, although they possess general financial management skills within their organisations. This suggests a gap between overall financial capacity and exposure to dedicated climate finance mechanisms.

On the implementation side, there are examples of practical engagement. Some respondents highlighted efforts such as promoting solar-powered irrigation technologies, including pumped sprinkler systems, and supporting projects structured around co-funding arrangements between farmers and the government. Others emphasised contributions to environmental protection, including reducing air and noise pollution through cleaner energy initiatives.

Additionally, a few respondents demonstrated stronger thematic experience, particularly in programs aimed at building climate resilience among vulnerable populations, such

as smallholder farmers, refugees, and host communities. These efforts reflect a broader development-oriented approach to climate financing, even where direct funding streams may be limited.

Overall, the findings suggest that while there is a foundational level of experience in managing funds and implementing energy-related initiatives, direct exposure to climate-specific funding remains limited, and capacity could be strengthened through targeted support, training, and increased access to dedicated financing opportunities.

OBJECTIVE 2: Determining weaknesses limiting effective promotion of PUSE interventions

This objective was about determining weaknesses limiting effective promotion of PUSE intentions, and the details are indicated below:

a. Institutional weaknesses

The study assessed institutional weaknesses affecting the promotion, adoption, and policy advocacy of the Productive Use of Solar Energy (PUSE). The assessment examined the institutional capacity of CSOs, farmer organizations, local governments, and community structures involved in PUSE-related interventions. It focused on governance systems, staffing and technical expertise, coordination mechanisms, policy engagement capacity, financial and resource limitations, monitoring and reporting systems, and the ability of institutions to effectively support advocacy and implementation processes. It explored gaps in collaboration, information sharing, strategic planning, and sustainability of PUSE initiatives. The findings identified several institutional weaknesses that are limiting the uptake and promotion of PUSE.

A key challenge is the presence of weak governance systems, where structures such as boards and oversight mechanisms are either underdeveloped or not fully functional. This affects accountability, coordination, and effective decision-making within organisations.

In addition, there is limited strategic planning capacity, with many organisations lacking clear, forward-looking plans that prioritise and integrate PUSE into their core programs. Where plans exist, they are often not sufficiently detailed or aligned with emerging energy and climate priorities.

The assessment also highlights poor documentation of policies, which undermines consistency in implementation and institutional memory. The absence or weak articulation of operational and guiding policies makes it difficult to standardise processes, enforce compliance, and effectively scale interventions.

Together, these institutional gaps constrain the ability of organisations to systematically promote and implement PUSE, pointing to the need for strengthening governance structures, improving strategic planning processes, and enhancing policy development and documentation.

b. Technical weaknesses

The CNA highlights several technical weaknesses that are limiting the uptake and promotion of PUSE.

The lack of renewable energy expertise within organisations, particularly in areas such as system design, installation, operation, and maintenance, and troubleshooting. This limits the ability to effectively plan, implement, and scale PUSE interventions.

There is limited access to qualified technicians, especially in the rural and underserved districts that were studied. This creates delays in installation, maintenance challenges, and increased costs, ultimately discouraging adoption of renewable energy technologies.

In addition, organisations face weak training capacity, which affects both staff and end users. Without adequate training programs, cooperatives, farmers, and other beneficiaries often lack the skills needed to operate and maintain PUSE systems effectively, leading to underutilization or system failure.

c. Financial weaknesses

The CNA identifies several financial weaknesses that are constraining the uptake and promotion of PUSE.

The high cost of solar technologies, which creates a significant barrier for both organisations and end users, particularly smallholder farmers. The substantial upfront investment required discourages adoption despite the long-term benefits of renewable energy solutions.

There are limited financing mechanisms available to support PUSE initiatives. The absence of tailored financial products, such as affordable credit, subsidies, or revolving funds, restricts the ability of organisations and communities to invest in and scale these technologies.

The weak partnerships with financial institutions, which further limit access to funding. Without strong linkages to banks, microfinance institutions, or other financing entities, organisations struggle to mobilise resources and design innovative financing models suited to renewable energy investments.

d. Policy advocacy weaknesses

The CNA reveals several policy advocacy weaknesses that are limiting the uptake and promotion of PUSE.

The limited knowledge of energy policy frameworks, which reduces the ability of organisations to effectively engage with and influence policy processes. Without a clear understanding of existing regulations and policy opportunities, stakeholders struggle to position PUSE within national and local development agendas.

There is also weak coalition-building, with limited collaboration among organisations, networks, and stakeholders. This weakens collective advocacy efforts and reduces the overall influence needed to drive policy change.

In addition, limited research and evidence generation hampers the ability to support advocacy positions with credible data. Without strong evidence, it becomes difficult to

demonstrate the impact and viability of PUSE solutions to policymakers.

Organisations also face limited platforms for policy engagement, restricting their participation in key decision-making processes. This is further compounded by the inadequate responsiveness of the government to community needs, where grassroots priorities and experiences are not sufficiently considered in policy formulation and implementation.

e. Coordination weaknesses

The CNA highlights several coordination weaknesses that are limiting the uptake and promotion of PUSE.

A key challenge is the fragmented PUSE ecosystem across different sectors of the economy, where stakeholders in energy, agriculture, water, and enterprise development operate in silos. This lack of integration reduces synergies, leads to duplication of efforts, and limits the overall impact of PUSE interventions.

There are also weak district-level coordination platforms, which constrain effective planning, information sharing, and alignment of activities among local actors. Without strong coordination mechanisms at this level, it becomes difficult to integrate PUSE into district development priorities and ensure coherent implementation.

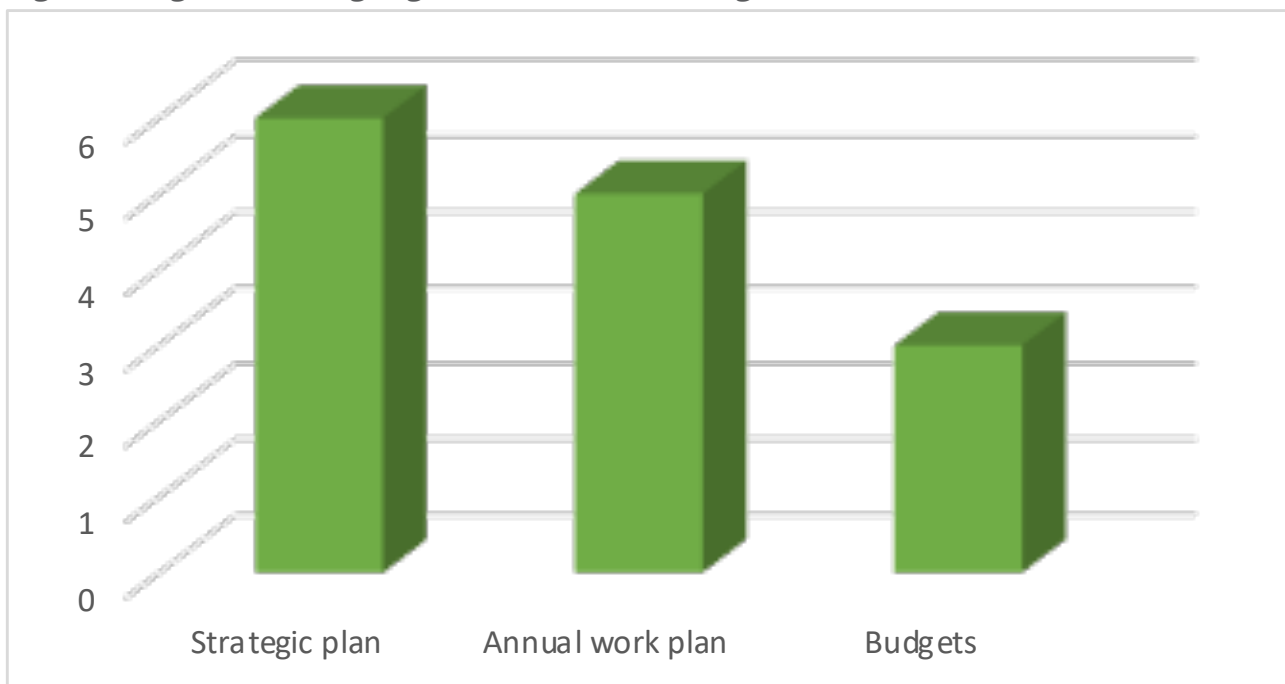
In addition, cooperatives are often weak, limiting their ability to aggregate demand, mobilise resources, and support members in adopting renewable energy technologies. Similarly, a weak private sector presence reduces the availability of technical services, financing options, and market-driven solutions necessary for scaling PUSE.

f. Planning and Integration Weaknesses

The assessment examined the extent to which PUSE interventions are integrated into district development plans, sector work plans, budgets, and broader agricultural and climate resilience strategies. The focus was on coordination between departments and stakeholders, alignment of PUSE priorities with local government planning frameworks, participation of CSOs and farmer organizations in planning processes, and the availability of clear implementation and monitoring mechanisms.

1) Integrate PUSE into planning processes

Forty-five (45%) of the respondents incorporate/integrate PUSE planning in their Strategic Plans. Only 36% integrate PUSE in the Annual Work Plans, and 27 % reflect PUSE in the actual budgets.

Figure 2: Figure showing organisational PUSE integration

The issues/items considered in the planning processes include:

- i. Small itemised projects and activities relating to solar energy. These include small-scale, targeted projects that promote the adoption and effective use of solar energy across different sectors, particularly in agriculture and rural development.
- ii. Establishment of solar-powered cooling equipment. The planning and budgeting were intended to provide reliable cold storage for perishable products such as milk, fruits, vegetables, and fish. It was intended to reduce post-harvest losses, improve product quality, and extend shelf life.
- iii. Support to farmers with solar irrigation systems, to procure solar panels to power water pumps that draw water from boreholes, rivers, or wells for crop irrigation and enable farmers to practice irrigation throughout the year, including during dry seasons, thereby improving food security and increasing agricultural productivity.
- iv. Solar equipment service and maintenance (of inverters and batteries) to ensure long-term functionality of solar systems, and regular service and maintenance activities. These also include inspection, cleaning, and repair of solar panels to maintain optimal energy generation.
- v. Budgeting and planning for capacity building and training provide to users on proper handling and basic troubleshooting of solar equipment.

58.3% of the organisations have participated in district planning processes (e.g., in the development of District Development Plans, sector planning meetings). The issues/concerns raised include:

- i. Participating organisations emphasised the need to incorporate solar energy solutions into district development priorities. Solar energy is being recognised as a

key driver for rural transformation (in trading centres, in farmers' houses), particularly in off-grid communities.

- ii. There has been an increasing focus on moving beyond basic household lighting to productive applications of solar energy. This includes solar-powered irrigation, agro-processing, refrigeration, and small-scale enterprises.
- iii. Financing of solar technologies remains a major issue raised during planning processes. Stakeholders need subsidies, credit facilities, and flexible financing models to enable farmers and small businesses to acquire solar equipment. They complained about high prices and low-quality solar products.
- iv. Limited technical knowledge and skills (need for capacity building and training) in the installation, operation, and maintenance of solar systems were identified as constraints. District plans increasingly consider training programs for technicians and end-users.
- v. Operation and maintenance for longterm functionality of solar systems is a key concern. Planning discussions include strategies for regular maintenance, availability of spare parts, and local technical support.
- vi. For solar energy to effectively support productive use, complementary infrastructure is necessary. This includes access to water sources for irrigation, roads for transporting goods, and markets for selling produce. District planning processes should consider how solar investments can be linked to value chains and market opportunities.
- vii. There is a policy and coordination challenge among stakeholders (government departments, NGOs, and private sector actors). There is a need for clear policies and guidelines to streamline solar energy interventions.

2) Integration into District Development Planning processes

Five respondents indicated that they do not integrate PUSE into District Development Plans, while three reported that they do. None of the respondents had participated at the national level. Additionally, 63% reported having no evidence to inform planning decisions, whereas 34% indicated that they did have such evidence.

The findings indicate significant gaps in institutional alignment and evidence-based decision-making. There is a need to strengthen local governance and planning in general terms. The fact that 62.5% of respondents (5 out of 8) do not integrate their work into District Development Plans suggests a major disconnect between PUSE initiatives and local government frameworks. The capacity assessment must identify why this gap exists, whether it's due to a lack of awareness, technical skills in planning, or rigid organisational structures. Capacity building should focus on aligning PUSE projects with District Development Plans to ensure sustainability and resource mobilisation.

Since none of the respondents participated at the national level, there is a total absence of "bottom-up" influence on national energy or development policies. Local PUSE needs are likely not reflected in the National Development Plan (NDPIV) or national budgeting

processes. Training is required to empower local stakeholders to engage in national policy reviews and advocacy.

With 63% of respondents lacking evidence to inform planning, decisions are likely being made based on intuition rather than data. Data relating to agricultural yield as a result of farmers who have adopted solar energy use for irrigation, cooling, etc. Without data-driven planning, PUSE investments may fail to target the most productive sectors, leading to wasted resources. The assessment must prioritise “Data for Development” training, focusing on collecting, analysing, and using statistical information for evidence-based policy making.

The high percentage of respondents without evidence (63%) and those not participating nationally suggests a lack of specialised “Problem Assessment Skills”. There is likely a shortage of staff capable of conducting the complex technical analysis required for PUSE (e.g., energy demand forecasting or economic impact studies). Targeted training in monitoring and evaluation (M&E) and strategic management is essential to bridge these gaps.

3) Challenges faced in integrating PUSE into planning and budgeting

- i. The need for planning and budgeting reflects uncertainty in real-world conditions. For example, seasonal changes (like rainy periods) require hybrid energy systems (solar + generators + hydropower), making cost projections more complex and less predictable.
- ii. Solar and related technologies require significant upfront investment, which is difficult for organisations with limited financial capacity, let alone farmers who lack startup capital. This creates a mismatch between technical readiness and financial capability.
- iii. There is a lack of financing strategies to sustain projects. Organisations often have insufficient funds for scaling initiatives, while farmers struggle to access credit or subsidies. This leads to slow adoption and underfunded implementation.
- iv. Shortages of essential materials disrupt planning and budgeting. These constraints can lead to increased costs, project delays or difficulty in forecasting procurement needs.
- v. Both staff and partners lack up-to-date technical knowledge on PUSE systems. Farmers also face limited awareness and challenges in operation and maintenance. This increases the need (and cost) for training and capacity building.
- vi. Having a few trained personnel restricts the organisation’s ability to plan effectively, supervise implementation, or even scale projects. This creates bottlenecks in execution and monitoring.
- vii. Organisations will only be positioned to provide technical assistance, not financing. This limits their influence over adoption, since financial barriers remain unresolved for end users.
- viii. The overall cost of solar facilities remains a major barrier. Even when long-term

benefits are clear, the initial investment discourages uptake, complicating budgeting assumptions about adoption rates.

- ix. Farmers face a combination of limited startup capital, knowledge gaps, and maintenance challenges. These factors reduce demand predictability and increase the risk of project failure.
- x. Projects (e.g., irrigation near wetlands) face regulatory hurdles, which can delay approvals and increase compliance costs.
- xi. Limited organisational funds force trade-offs between new PUSE initiatives and existing operational needs. This results in under-prioritisation of innovative energy solutions.

OBJECTIVE 3: Analyse external opportunities and enabling factors supporting PUSE scaling

The study analyzed external opportunities and enabling factors that support the scaling of the Productive Use of Solar Energy in the selected districts. It focused on government policies and programs promoting renewable energy and climate-smart agriculture, availability of development partner support, emerging financing opportunities, private sector engagement, technological advancements in solar energy systems, and increasing community awareness of clean energy solutions. Here, below are the findings:

a. Policy environment

Existing national frameworks provide a strong foundation for integrating renewable energy into agricultural development and rural livelihoods.

Table 8: Table showing frequencies of known energy policies

National Policies related to PUSE	Frequency
Climate Change Policy 2015	6
National Irrigation Policy 2018	5
National Organic Agriculture Policy 2020	4
Energy Policy 2023	4
Energy Transition Plan 2023	3
Third Strategic Plan (ASSP III 2018)	2
Green Manufacturing Strategy 2021 - 2025	2
Updated NDCs 2022	2
The Electricity Amendment Act 2022	2

Firstly, renewable energy policies present a key opportunity for advancing PUSE. These policies promote the adoption of clean and sustainable energy solutions, including solar technologies, especially in off-grid and rural areas. They create an enabling environment through incentives, regulatory support, and national targets for renewable energy expansion. This provides a strategic entry point for CSOs, cooperatives, and farmer groups to align

their interventions with national energy priorities and advocate for increased investment in solar-powered agricultural applications.

Secondly, climate change strategies offer an important platform for scaling PUSE interventions. As Uganda prioritises climate resilience and low-carbon development, solar energy technologies are increasingly recognised as critical tools for adaptation and mitigation. PUSE contributes directly to climate-smart agriculture by reducing reliance on fossil fuels, improving water management through solar irrigation, and minimising post-harvest losses. This alignment creates opportunities for accessing climate finance, integrating PUSE into resilience-building programs, and strengthening the role of CSOs in climate policy advocacy.

Thirdly, agricultural modernisation programs provide a practical pathway for mainstreaming PUSE into value chains. These programs focus on increasing productivity, enhancing value addition, and improving market access for farmers. Solar-powered technologies, such as irrigation systems, agro-processing equipment, and cold storage, directly support these objectives. By embedding PUSE within agricultural development initiatives, there is potential to accelerate adoption, improve rural incomes, and enhance food security.

b. Private sector partnerships

The CNA identifies private sector partnerships as a critical opportunity for scaling up the Productive Use of Solar Energy (PUSE). Collaboration with key market actors can help address persistent technical, financial, and service delivery gaps that currently limit adoption.

Partnerships with solar companies present strong potential to expand access to appropriate and high-quality technologies. These companies can support the supply, installation, operation and maintenance of solar systems such as irrigation pumps, cold storage facilities, and agro-processing equipment. Engaging solar providers also creates opportunities for after-sales services, technical training, and innovation in product design tailored to smallholder farmers' needs. Strengthening linkages between CSOs, farmer groups, and solar companies can therefore improve reliability, reduce system failures, and accelerate technology uptake.

Microfinance institutions offer a key pathway to overcoming financial barriers associated with the high upfront cost of solar technologies. Through tailored financial products, such as asset financing, loans, and pay-as-you-go models, these institutions can enable farmers and cooperatives to invest in solar solutions. Partnerships in this area can also support the development of blended finance models, combining grants, credit, and subsidies to make PUSE more affordable and scalable. Enhancing collaboration with microfinance providers will be essential in expanding access to capital and increasing adoption rates.

In addition, agri-tech firms provide opportunities to integrate solar energy into broader agricultural value chain solutions. These firms can support innovations in irrigation management, post-harvest handling, digital agriculture, and market access. By combining solar technologies with digital tools and climate-smart practices, agri-tech partnerships can enhance productivity, efficiency, and profitability for farmers. This integration is critical for ensuring that PUSE is not implemented in isolation but as part of a holistic approach to agricultural development.

c. Market opportunities

The capacity needs assessment identifies market opportunities as a key driver for scaling up the Productive Use of Solar Energy (PUSE), particularly in strengthening agricultural value chains. The growing demand for efficient, climate-smart solutions presents significant potential for expanding solar technologies across multiple productive applications.

One major opportunity lies in enhancing irrigation productivity. Solar-powered irrigation systems enable farmers to access reliable water sources throughout the year, reducing dependence on rainfall and increasing cropping intensity. This supports higher yields, improved food security, and more stable incomes. As demand for irrigation grows, especially in the face of climate variability, solar solutions provide a cost-effective and sustainable alternative to fuel-based systems.

There are also strong opportunities in agro-processing, where solar energy can power equipment such as mills, oil presses, milk chillers, and dryers. By enabling on-site processing, farmers and cooperatives can add value to their produce, reduce transportation costs, and access better markets. This contributes to increased profitability and strengthens local agro-industrial development.

In addition, cold chain development presents a critical area for PUSE expansion. Solar-powered refrigeration and cold storage systems help preserve perishable goods such as milk, fish, fruits, and vegetables. This significantly reduces spoilage, extends shelf life, and improves product quality. In off-grid rural areas where conventional cold storage is unavailable, solar cold chains offer a transformative solution for linking farmers to markets and reducing losses.

Similarly, solar technologies can improve post-harvest management, particularly through applications such as solar drying and storage systems. These technologies help maintain product quality, reduce contamination, and minimise losses after harvest. Improved post-harvest handling not only increases the quantity of marketable produce but also enhances food safety and income stability for farmers.

d. Policy advocacy opportunities

CSOs can influence policy through strategic advocacy focusing on the thematic areas highlighted in the table below.

Table 9: Policy advocacy opportunities

Thematic area	Strategic advocacy area of focus
Solar irrigation policy support	<ul style="list-style-type: none"> i. Subsidies for solar irrigation systems ii. Integration of solar irrigation into agricultural programs
Rural energy financing	<ul style="list-style-type: none"> i. Credit schemes for solar technologies. ii. Agricultural energy financing facilities

Thematic area	Strategic advocacy area of focus
Solar cold chain development	Advocate for public investment in: <ol style="list-style-type: none"> i. Solar-powered cold storage ii. Solar milk cooling systems
Tax incentives	Advocate for: <ol style="list-style-type: none"> i. VAT exemptions on solar equipment ii. Import duty reductions
Integration into agricultural policy	Ensure solar energy is integrated into national agricultural programs.
Integration of PUSE into the district development plan	<ol style="list-style-type: none"> i. Ensure PUSE interventions align with the district's development priorities, sector plans, and budgeting frameworks. ii. Integrate PUSE within relevant sectors such as agriculture, water, trade, health, education, and environment.

e. District-level engagement opportunities

District-level engagements are a critical opportunity for scaling up the Productive Use of Solar Energy (PUSE), given the central role that local governments play in planning, coordination, and service delivery.

There are already entry points through participation in district planning processes, such as the development of District Development Plans (DDPs) and sectoral planning meetings, though participation is limited. The assessment indicates that several organizations have engaged in these processes, where they have advocated for the inclusion of solar energy solutions within local development priorities. This provides a strategic opportunity to mainstream PUSE into district plans, budgets, and implementation frameworks.

District engagement also offers a platform to promote the transition from basic energy access (such as lighting) to productive uses of solar energy, including irrigation, agro-processing, refrigeration, solar drying, and rural enterprises. Local governments are increasingly recognising the role of solar energy in driving rural transformation, especially in off-grid communities, creating an enabling environment for scaling PUSE interventions.

In addition, district-level platforms facilitate multi-stakeholder coordination, bringing together government departments, CSOs, cooperatives, private sector actors, and farmer groups. These platforms can be used to align interventions, share knowledge, and address cross-cutting challenges such as infrastructure gaps, access to water for irrigation, market linkages, and maintenance services.

The CNA also highlights opportunities to address key constraints through district engagement. These include advocating for financing mechanisms such as subsidies and credit schemes for solar technologies, promoting capacity building and training for technicians and end-users, and strengthening systems for operation and maintenance to ensure the sustainability of solar investments.

Furthermore, district-level engagement can support improved policy implementation and coordination, particularly by influencing how national policies on renewable energy,

agriculture, and climate change are translated into local development action. By actively participating in these processes, CSOs, cooperatives, and farmer groups can ensure that PUSE is effectively integrated into local priorities and resource allocation decisions.

OBJECTIVE 4: Capacity strengthening interventions to enhance policy advocacy and implementation

a. Commonalities regarding the capacity of CSOs to advocate for PUSE

The study found several common characteristics across CSOs regarding their capacity to advocate for the Productive Use of Solar Energy (PUSE) in agricultural value chains, and these include:

- i. Most CSOs demonstrated a basic understanding of renewable energy, climate resilience, and agricultural development issues, but had limited technical knowledge specifically related to PUSE technologies.
- ii. Many CSOs had well-established relationships with communities and farmer groups, enabling them to conduct sensitization, mobilization, and awareness campaigns effectively at the grassroots level.
- iii. While organizations engaged in community development and service delivery, fewer had strong experience in structured policy advocacy, lobbying, evidence-based engagement, or influencing district and national decision-making processes.
- iv. CSOs, farmer groups, and cooperatives relied on donor-funded projects, which affected the sustainability and continuity of advocacy efforts.
- v. There is inadequate staffing, limited training on energy and climate policy issues.

Despite existing limitations, most organizations expressed strong commitment and willingness to strengthen their advocacy, partnership-building, and technical capacities related to PUSE.

b. Common gaps identified

The study identified gaps affecting the effective advocacy, coordination, and implementation of PUSE interventions and these include:

1. Limited technical knowledge on PUSE and technical application within agricultural value chains.
2. Weak policy advocacy capacity, including policy analysis, evidence generation, lobbying, communication, and engagement with government planning and budgeting processes.
3. Limited participation in planning and budgeting processes that reduces their influence on resource allocation and policy integration.

4. Weak coordination and collaboration where actors remained fragmented, resulting in duplication of efforts and limited collective action.
5. Awareness and uptake of PUSE technologies among farmers and communities remained low due to limited sensitization, affordability challenges, and inadequate demonstration of benefits.
6. There was inadequate documentation of successful PUSE practices, lessons learned, and impact evidence to support advocacy and scaling efforts.

The common strategies needed to address those gaps are:

- i. Provide targeted training for CSOs, farmer organizations, and local leaders on renewable energy and climate policies, policy advocacy and lobbying, government planning and budgeting processes, evidence generation and communication
- ii. Establish and strengthen district and national coordination mechanisms that bring together CSOs, government, private sector, media, researchers, and farmer groups for joint advocacy and information sharing.
- iii. Support organizations to strengthen governance systems, strategic planning, financial management, monitoring and evaluation, and resource mobilization capacities.
- iv. Increase Engagement in Local Government Processes
- v. Facilitate meaningful participation of CSOs and farmer organizations in district planning, budgeting, and policy dialogue platforms to influence integration of PUSE priorities.
- vi. Support stakeholders to identify and access PUSE funding and innovative financing models for scaling PUSE interventions.
- vii. Develop systems for documenting best practices, lessons learned, and impact evidence to inform advocacy, policy influence, and scaling strategies.

c. Support needed for PUSE integration

The study was designed to establish the support needed for supporting PUSE integration. The assessment, therefore, highlights several strategic actions that can further strengthen policy advocacy and implementation of PUSE initiatives:

- i. Develop and institutionalise advocacy strategies to guide engagement with district and national policy processes, ensuring that advocacy efforts are structured and consistent with PUSE, and results-oriented.
- ii. Strengthen evidence generation and data management systems to support evidence-based advocacy, including the collection of data on productivity, income impacts, and energy use in agricultural value chains.
- iii. Build coalition and network platforms among CSOs, cooperatives, farmer groups, private sector actors, and development partners to amplify collective voice and influence policy decisions.

- iv. Enhance engagement in district and national planning cycles, including active participation in the development of District Development Plans and national policy consultations.
- v. Promote inclusive approaches, ensuring that women, youth, and vulnerable groups are actively involved in PUSE initiatives and policy advocacy processes.
- vi. Facilitate access to innovative financing mechanisms, such as blended finance, pay-as-you-go models, and revolving funds, to support the adoption of solar technologies.
- vii. Strengthen monitoring and evaluation (M&E) systems to track performance, measure impact, and inform adaptive management of PUSE interventions.
- viii. Support knowledge sharing and learning platforms, including exchange visits, peer learning, and documentation of best practices to scale successful models.
- ix. Enhance partnerships with financial institutions, enabling the development of tailored financial products that support farmers and cooperatives in acquiring solar technologies.
- x. Invest in communication and visibility strategies, including the use of media and digital platforms to raise awareness, influence public opinion, and attract policy attention.
- xi. Strengthen institutional governance and accountability systems, ensuring that organisations are better positioned to manage resources, build credibility, and attract more funding for PUSE technologies.
- xii. Promote integration of PUSE into broader development programs, such as climate resilience, agricultural commercialisation, and rural development initiatives.
- xiii. Support private sector engagement frameworks, encouraging collaboration with solar companies, agri-tech firms, and service providers to scale market-driven solutions.
- xiv. Advocate for supportive fiscal policies, including subsidies, tax incentives, and import duty reductions on solar equipment to reduce costs and improve accessibility.
- xv. Build capacity in project design and proposal development, enabling organisations to effectively mobilise resources from donors and climate financing mechanisms.

Together, these interventions complement the participants' responses by strengthening institutional systems, enhancing evidence-based advocacy, improving financing access, and fostering multi-stakeholder collaboration, ultimately supporting the effective scaling and sustainability of PUSE initiatives.

d. institutional capacity strengthening

The capacity needs assessment highlights the importance of institutional strengthening as a foundation for enhancing policy advocacy and effective implementation of PUSE initiatives. Participants emphasised several priority areas, alongside additional strategic recommendations to build resilient and well-functioning organisations.

A key intervention is governance and policy development training, aimed at strengthening the effectiveness of boards and management structures. This includes building capacity in leadership, accountability, decision-making processes, and the development of clear operational and governance policies to guide organisational performance.

There is also a critical need to enhance strategic planning capacity. Organisations require support to develop comprehensive, forward-looking strategic plans that clearly integrate PUSE priorities. This includes improving skills in planning, budgeting, and aligning organisational objectives with national and district development frameworks.

Strengthening institutional policy frameworks is equally important. Many organisations lack well-documented and functional internal policies. Capacity building should focus on developing and operationalising policies related to finance, operations, gender inclusion, partnerships, and renewable energy programming to ensure consistency, compliance, and sustainability.

Another priority area is the development of advocacy strategies. Organisations need structured approaches to policy engagement, including identifying advocacy goals, target audiences, key messages, and engagement pathways at both district and national levels. This will enable more coordinated and impactful influence on policy processes.

In addition to these core areas, the assessment suggests several complementary institutional strengthening interventions:

- i. Strengthening organisational systems and procedures, including financial management, reporting, and accountability mechanisms to enhance credibility and attract funding.
- ii. Capacity building in project design and management, enabling organisations to develop bankable proposals and effectively implement and scale PUSE interventions.
- iii. Enhancing monitoring and evaluation (M&E) systems to support evidence-based decision-making and demonstrate impact.
- iv. Improving knowledge management and documentation practices, ensuring lessons learned and best practices are captured and shared.
- v. Promoting internal coordination and communication to improve efficiency and alignment across departments and programs.
- vi. Strengthening partnerships and networking capacity, enabling organisations to collaborate effectively with government, the private sector, and development partners.
- vii. Mainstreaming gender and social inclusion, ensuring equitable participation and benefits from PUSE initiatives.

e. *Technical capacity development and strengthening*

The capacity needs assessment underscores the importance of technical capacity

development as a critical enabler for effective policy advocacy and implementation of PUSE initiatives. Strengthening technical skills not only improves project delivery but also enhances the credibility of organisations when engaging in policy dialogue.

A key priority is training on solar technologies, particularly across the full lifecycle of PUSE systems. This includes system design, installation, operation, and maintenance of technologies such as solar irrigation, agro-processing equipment, drying systems, and cold storage facilities. Training should target both organisational staff and end users (e.g., farmers and cooperatives) to ensure sustainability and proper utilisation of systems.

There is also a need to establish and strengthen partnerships with training institutions, including technical colleges, vocational training centres, and renewable energy institutes. These partnerships can support standardised training programs, certification of technicians, and continuous skills development to meet the growing demand for solar energy expertise.

In addition, developing technical advisory networks is essential. Such networks can provide ongoing support to organisations and communities through mentorship, troubleshooting, and the sharing of best practices. They can also facilitate linkages between CSOs, private sector service providers, and technical experts to ensure timely and quality service delivery.

Beyond these areas, the assessment suggests several additional technical capacity strengthening interventions:

- i. Farmer-focused training and extension services to improve understanding, adoption, and effective use of solar technologies in agricultural production and value addition.
- ii. Capacity building in system design and site assessment, enabling organisations to plan context-specific and efficient PUSE solutions.
- iii. Strengthening operation and maintenance systems, including training local technicians and establishing maintenance protocols to ensure long-term functionality.
- iv. Development of demonstration and learning sites, where stakeholders can observe and learn from practical applications of PUSE technologies.
- v. Enhancing value chain integration skills, ensuring that solar technologies are effectively linked to production, processing, storage, and market access.
- vi. Training in quality assurance and standards compliance, to ensure the use of reliable and durable solar equipment.
- vii. Promotion of digital and smart technologies, such as remote monitoring systems and data-driven farm management tools integrated with solar applications.
- viii. Support for innovation and adaptive technologies, encouraging locally appropriate solutions that respond to specific community needs.

f. *Advocacy and policy engagement capacity*

While some organisations are engaged in policy discussions, their efforts are often informal, inconsistent, and not backed by strong evidence or structured strategies.

A key recommendation is to build capacity in policy analysis and understanding of energy and agricultural policy frameworks. Organisations need the skills to interpret policies, identify entry points, and align PUSE interventions with national and district priorities. This will enable more informed and strategic engagement with policymakers.

There is also a need to support the development of clear advocacy strategies, including defining advocacy goals, identifying target audiences, crafting key messages, and selecting appropriate engagement channels. Structured advocacy approaches will enhance consistency and impact in influencing policy decisions.

Organisations should be supported to generate, analyse, and use data to demonstrate the benefits of PUSE, such as increased productivity, income generation, and climate resilience. This includes building capacity in research, data collection, and documentation of success stories.

Enhancing participation in policy engagement platforms is another priority. Organisations need support to actively engage in district planning processes, national policy dialogues, and sector working groups. This will ensure that grassroots experiences and needs are reflected in policy formulation and implementation.

In addition, the assessment suggests several complementary interventions to strengthen advocacy and policy engagement:

- i. Coalition building and networking, to create stronger, unified voices among CSOs, farmer groups, and other stakeholders advocating for PUSE.
- ii. Communication and messaging skills development, including the use of media, policy briefs, and digital platforms to effectively influence public opinion and decision-makers.
- iii. Capacity building in stakeholder mapping and engagement, enabling organisations to identify key actors and tailor their advocacy approaches accordingly.
- iv. Training in negotiation and lobbying skills to improve effectiveness in engaging policymakers and influencing decisions.
- v. Strengthening monitoring and evaluation for advocacy, to track progress, measure influence, and refine strategies over time.
- vi. Promoting inclusive advocacy approaches, ensuring that women, youth, and vulnerable groups are represented and their voices amplified in policy processes.
- vii. Facilitating access to policy forums and platforms, including support for participation in national consultations and multi-stakeholder dialogues.
- viii. Developing knowledge products, such as policy briefs, case studies, and technical reports, to support advocacy efforts.

g. Capacity strengthening – coordination and partnerships

The capacity needs assessment identifies coordination and partnerships as a critical area for

strengthening in order to enhance policy advocacy and effective implementation of PUSE initiatives. Weak linkages among stakeholders have limited information sharing, resource mobilisation, and collective influence, underscoring the need for more structured and strategic collaboration.

A key recommendation is to strengthen multi-stakeholder coordination platforms that bring together CSOs, government agencies, private sector actors, and development partners. These platforms can facilitate joint planning, alignment of interventions, and sharing of experiences, ensuring that efforts are complementary rather than fragmented.

There is also a need to enhance collaboration between CSOs and government institutions, particularly at the district and national levels. Strengthening these relationships will improve integration of PUSE into development plans, budgets, and policy frameworks, while also ensuring that community-level experiences inform government decision-making.

Partnerships with the private sector, including solar companies, agri-tech firms, and financial institutions, should be strengthened to improve access to technologies, technical services, and financing solutions. Engaging private actors can help scale market-driven approaches and ensure sustainability beyond project cycles.

In addition, fostering stronger linkages with development partners and donors can support resource mobilisation, technical assistance, and knowledge exchange. Coordinated engagement with partners can also reduce duplication and enhance the impact of interventions.

Beyond these core areas, the assessment suggests several complementary coordination and partnership-strengthening interventions:

- i. Establishing formal coordination mechanisms, such as working groups, platforms, or consortia focused on PUSE at the district and national levels.
- ii. Promoting joint programming and resource pooling, allowing organisations to implement larger, more impactful projects collaboratively.
- iii. Strengthening cooperatives and farmer organisations, enabling them to play a more active role in aggregation, advocacy, and service delivery.
- iv. Developing partnership frameworks and Memoranda of Understanding (MoUs) to guide collaboration and clarify roles and responsibilities.
- v. Enhancing communication and information-sharing systems, including regular stakeholder meetings and digital platforms for knowledge exchange.
- vi. Building capacity in partnership management, including negotiation, coordination, and conflict resolution skills.
- vii. Encouraging public-private partnerships (PPPs) to leverage investments and technical expertise for scaling PUSE technologies.
- viii. Facilitating regional and cross-district collaboration, enabling replication of successful

models and sharing of best practices.

- ix. Strengthening linkages with research and academic institutions to support innovation, evidence generation, and technical backstopping.

7. KEY RECOMMENDATIONS

The key recommendations arising from the Capacity Needs Assessment (CNA) can be grouped into four major areas: institutional strengthening, technical capacity development, policy advocacy, and coordination/financing mechanisms. Below is a clear synthesis of the most important recommendations:

1. Strengthen institutional capacity

The report strongly emphasises building more functional and resilient organisations by:

- i. Improving governance systems (boards, accountability structures, internal policies).
- ii. Develop clear operational, financial, and gender policies.
- iii. Strengthen strategic planning and budgeting, ensuring PUSE is integrated into organisational plans.
- iv. Build capacity in project design and proposal development to attract funding.

2. Build technical capacity for PUSE

Technical gaps were identified as a major constraint to implementation, and therefore, the recommendations are:

- i. Strengthen farmer and cooperative training on the use of solar technologies.
- ii. Establish technical partnerships with training institutions and solar companies.
- iii. Develop local technician networks and maintenance systems.
- iv. Promote demonstration sites and practical learning platforms.
- v. Improve value chain integration of solar technologies (irrigation, processing, cold storage).

3. Strengthen policy advocacy and engagement

Policy advocacy is one of the weakest areas and a top priority. The recommendations are therefore to:

- i. Develop structured advocacy strategies (clear goals, messages, targets).
- ii. Build capacity in policy analysis and understanding of energy/agriculture frameworks.
- iii. Improve evidence generation and data use for advocacy (research, case studies).

- iv. Increase participation in district and national policy platforms.
- v. Strengthen communication and media engagement for visibility.
- vi. Promote inclusive advocacy (women, youth, vulnerable groups).

4. Improve coordination and Partnerships

Fragmentation in the PUSE ecosystem is a major bottleneck, and to address this concern, the following must be done:

- i. Establish multi-stakeholder coordination platforms (CSOs, government, private sector).
- ii. Strengthen CSO–government collaboration, especially at the district level.
- iii. Build partnerships with Solar companies (technology & services), financial institutions (financing solutions), agri-tech firms (value chain integration)
- iv. Strengthen cooperatives and farmer organisations for aggregation and service delivery.
- v. Promote public-private partnerships (PPPs).

5. Enhance access to financing

Financial barriers are a critical constraint to the adoption of PUSE, and therefore, we have to:

- i. Develop innovative financing mechanisms such as revolving funds.
- ii. Strengthen partnerships with microfinance institutions and banks to facilitate uptake of PUSE.
- iii. Advocate for policy incentives, including subsidies for solar technologies, tax exemptions, and reduced import duties

6. Strengthen planning, data, and integration

Weak planning and a lack of evidence undermine the impact that PUSE has achieved so far. Therefore, the core recommendations are:

- i. Integrate PUSE into district development plans and budgets.
- ii. Build capacity in data collection, analysis, and evidence-based planning.
- iii. Align PUSE with agriculture, climate, and rural development programs.
- iv. Support participation in national planning processes.

8. CONCLUSION


The assessment demonstrates that CSOs, cooperatives, and farmer organizations play a vital role in promoting renewable energy adoption in agricultural value chains. However, their ability to influence policy and scale solar technologies is constrained by advocacy capacity gaps.

Strategic investment in capacity development, combined with stronger policy engagement and partnerships, will significantly enhance the effectiveness of these organisations in promoting the productive use of solar energy in Uganda's agricultural sector.

Advocates Coalition for Development and Environment (ACODE) is an independent public policy research and advocacy think tank based in Uganda, working on a wide range of public policy issues. ACODE has for the last seven consecutive years been ranked in the Global go to Think tanks index report as one of the best think tanks in Uganda and globally.

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