



# Licensing of Public Plant Varieties: The Case of CSIR

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**Katrin Kuhlmann**  
**Adron Naggayi Nalinya**  
**Hillary Mireku Botey**  
**Doris Puozaa**  
**Lilian Gichuru**  
**Christopher Ochieng Ojiewo**

## **AUTHORS**

Katrin Kuhlmann ([kkuhlmann@newmarketslab.org](mailto:kkuhlmann@newmarketslab.org); [kak84@georgetown.edu](mailto:kak84@georgetown.edu)) is President and Founder of the New Markets Lab, a Professor in Graduate and International Programs at Georgetown University Law Center, and the Faculty Director of the Georgetown Law Center on Inclusive Trade and Development, Washington D.C, USA.

Adron Naggayi Nalinya ([analinya@newmarketslab.org](mailto:analinya@newmarketslab.org)) is an International Legal Specialist at New Markets Lab, Kampala, Uganda.

Hillary Mireku Botey is senior research scientist, seed systems expert, and intellectual property officer at CSIR-Crops Research Institute.

Doris Puzaa is a seed systems specialist at the Dryland Crops Program of CIMMYT supporting West and Central Africa

Lilian Gichuru is a seed systems specialist at the Dryland Crops Program of CIMMYT supporting Eastern and Southern Africa

Christopher Ochieng Ojiewo is a scientist at the International Maize and Wheat Improvement Center and a Partnerships & Seed Systems Lead of the Dryland Crops Initiative

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## Acronyms

AVISA	Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa
CGIAR	Consultative Group of International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Center
CRI	Crop Research Institute
CSIR	Council for Scientific and Industrial Research
DLC	Dryland legumes and cereals
EGS	Early Generation Seed
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
IP	Intellectual Property
IPMC	Intellectual Property Management Committee
IRRI	International Rice Research Institute
MOFA	Ministry of Food and Agriculture
NARES	National Agricultural Research Institution
NML	New Markets Lab
OPV	Open pollinated variety
PBR	Plant Breeders' Rights
PVP	Plant Variety Protection
SARI	Savanna Agricultural Research Institute
SFSA	Syngenta Foundation for Sustainable Agriculture
TARI	Tanzania Agricultural Research Institution

## Executive Summary

To achieve sustained productivity growth, it is critical that farmers adopt improved crop varieties alongside sound agronomic practices. The Council for Scientific and Industrial Research (CSIR), through its Crops Research Institute (CRI) and Savanna Agricultural Research Institute (SARI), leads the conduct and coordination of breeding and related research focused on developing crops suited to different agroecological zones with consumer preferred traits. However, unpredictable funding and limited dissemination capacity often prevent these innovations from reaching smallholder farmers who depend on them at scale

In response to these challenges, CSIR is increasingly exploring licensing as a way to stimulate the commercialization of its agricultural technologies. This approach aligns with CSIR's broader mandate to enhance the impact of its research by fostering collaboration with the private sector. Licensing agreements could offer a viable path for public varieties to enter the market, potentially generating royalty income that could be reinvested into further research and varietal promotion activities. This could also help ensure that farmers have access to the latest, most effective varieties.

However, the process of licensing public varieties is far from straightforward. While there is potential for licensing models to accelerate the commercialization of improved varieties, their success depends on overcoming several key barriers. Licensing agreements must be structured in a way that is attractive to the private sector, while also safeguarding the public interest and public good nature of some technologies. Public research institutions, such as CSIR, need to navigate the complex intersection of intellectual property rights, legal and regulatory frameworks, and market dynamics.

The importance of this issue has been recognized by the New Markets Lab (NML) and the Dryland Crops Program of the International Maize and Wheat Improvement Center (CIMMYT), as part of the implementation of the Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA) project, have worked to build capacity and share knowledge with key stakeholders in Ghana. These efforts have focused on supporting the CSIR in fostering the adoption of improved varieties by both the private sector and farmers.

This report on the licensing of public varieties by CSIR builds upon a body of work previously conducted by NML in countries such as Tanzania, Nigeria, Kenya, Uganda, Senegal, and Mali,<sup>1</sup> in collaboration with other partners, including CIMMYT, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute of Tropical Agriculture (IITA), the International Center for Tropical Agriculture (CIAT), and the Syngenta

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<sup>1</sup> Katrin Kuhlmann, Adron Nalinya Naggayi, and Camille Renou, 'Capacity Building and Licensing Needs Assessment in Malawi, Mali, Senegal, and Uganda' Seeds2B Africa and Syngenta Foundation for Sustainable Agriculture (2022) <[https://www.newmarketslab.org/assets/comparative\\_studies/4.pdf](https://www.newmarketslab.org/assets/comparative_studies/4.pdf)>.

Foundation for Sustainable Agriculture (SFSA). Through the AVISA project, NML has developed several resources to guide the licensing process. These include an Annotated Guide on Flexible Licensing Models and Agreements, which outlines various options for structuring licensing agreements and includes examples of potential provisions; Tanzania and Nigeria Guidebooks for Regulatory Aspects of Disseminating Public Varieties,<sup>2</sup> which examine the regulatory frameworks in both countries and their relevance to the licensing of public varieties; and Model Plant Variety Licensing Agreements tailored to the specific regulatory environments of Tanzania and Nigeria.

This report critically examines CSIR's nascent efforts on licensing its varieties. It assesses current approaches, evaluating both successes and shortcomings. While CSIR has made notable strides since reinitiating its licensing program in 2022 and expanding it in 2024, several gaps remain, particularly in terms of institutional capacity, awareness among stakeholders, and the alignment of legal and regulatory instruments with market needs. The report also identifies key challenges, such as the need for more robust public-private partnerships, more comprehensive training for researchers and stakeholders, and clearer guidelines for navigating the complex legal and regulatory landscape and licensing processes.

The findings and recommendations contained in the report are based on semi-structured consultations with nearly 40 stakeholders from CSIR who engaged in NML-led licensing workshops in Kumasi and Tamale. These included breeders, management teams, plant variety protection desk officers, legal representatives from CRI and SARI, and representatives from the private sector. Key recommendations for enhancing the effectiveness of CSIR's licensing efforts include:

**Establishing Multi-tiered Capacity-building Strategy:** Capacity building is needed at multiple levels, so a multi-tiered capacity building strategy could be developed to go beyond basic workshops and include practical, hands-on training in licensing negotiations, intellectual property and related law, and market access. This could include leveraging digital tools, such as the one under development by NML, to provide continuous access to capacity building tools and professional development through follow-up sessions and mentorship to ensure that knowledge is applied effectively and that stakeholders stay up to date with evolving standards in licensing practices.

**Formal EGS Supply Processes with Streamlined Distribution and Focus on Strengthening Infrastructure and Human and Financial Capacity:** CSIR could collaborate with the Ministry of Food and Agriculture (MOFA) and seed companies to obtain production data for better demand forecasting and supply alignment. This could include use of digital platforms for advance ordering and payment to improve EGS production planning, creation of

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<sup>2</sup> New Markets Lab, 'Tanzania Guidebook on Regulatory Aspects of Dissemination of Public Varieties' Seeds2B Africa and Syngenta Foundation for Sustainable Agriculture, (2019) <[https://www.newmarketslab.org/assets/legal\\_guide/8.pdf](https://www.newmarketslab.org/assets/legal_guide/8.pdf)> See also, New Markets Lab, 'Nigeria Guidebook on Regulatory Aspects of Dissemination of Public Varieties' Seeds2B Africa and Syngenta Foundation for Sustainable Agriculture (2019) <[https://www.newmarketslab.org/assets/legal\\_guide/6.pdf](https://www.newmarketslab.org/assets/legal_guide/6.pdf)>.

a registry to track breeder lines and licensed varieties, improved internal quality assurance mechanisms for EGS production, and sustainable financing through public-private partnerships or donors.

**Capacity Building on Intellectual Property Rights and Intellectual Asset Management for Public and Private Stakeholders:** Capacity building in legal aspects of intellectual property and intellectual asset management would be beneficial to CSIR's future work on licensing. Internally, CSIR could establish comprehensive DUS protocols for more crops, especially in AVISA focus area, and advocate for waiver of PVP registration fees for public varieties to reduce financial burdens and encourage innovation, with a focus on PVP for varieties that have the most market potential.

**Licensing Strategy for CRI and SARI for Varietal Promotion:** A licensing (and funding) strategy should be developed for CRI and SRI, including in collaboration with the private sector, to share promotion costs by leveraging innovative licensing models. These could include lower royalty rates for companies that commit to investment in varietal promotion and promotion of a demand-led breeding approach, including collaboration with experts from other fields (e.g., gender, socio-economic studies) to ensure that varieties meet diverse farmer and consumer needs.

**Variety Licensing Database:** A variety licensing database could be developed that includes up-to-date information on all available varieties, their traits, suitable growing conditions, and their licensing status (including whether they are protected under PVP). This database should be easily accessible by both public institutions and private sector stakeholders, with a user-friendly interface that allows for seamless access to information. Once created, the database should be regularly updated to reflect new varieties, changes in licensing agreements, and market trends. Further, CSIR could focus on creating a dynamic system for feedback from private sector actors to ensure that the varieties listed align with market needs, improving the flow of relevant information.

**Standardized Licensing Guidelines:** Standardized licensing guidelines should be developed across the relevant CSIR institutes. This process could be expedited through collaboration between CRI and SARI to ensure that the guidelines are harmonized, transparent, and easily accessible to potential licensees. The guidelines should clearly specify the required documentation, application procedures, and the responsibilities of both the licensor and licensee. A clear, well-publicized licensing process will not only streamline the application process but also enhance the confidence of private sector stakeholders in engaging with public sector innovations.

**Capacity Building for Private Seed Companies:** Capacity building support for the private sector should cover some of the same issues noted above. It could also include matched financial support, infrastructure development, and training in formal business practices. This would enable seed companies to independently produce EGS and engage in formal licensing processes, fostering a more sustainable and growth-oriented seed sector in Ghana.

# I. Background on CSIR Licensing Instruments and Approach

Across sub-Saharan Africa, crop breeding is predominantly carried out by public research institutions.<sup>3</sup> Unfortunately, many of these institutions face significant resource constraints, which not only affect their ability to conduct continuous breeding but also limit the widespread adoption of developed technologies.<sup>4</sup> Licensing presents a potential solution for NARES to foster greater adoption of publicly-bred varieties. By formalizing agreements between NARES and the private sector, licensing can enhance traceability of licensed materials, provide insights into market-preferred traits, and facilitate the private sector's involvement in producing EGS.<sup>5</sup> This, in turn, can enable timely access for farmers to improved varieties.<sup>6</sup> Furthermore, royalty payments from licensing agreements can create a sustainable revenue stream to support further breeding and research efforts.<sup>7</sup>

In Ghana, crop breeding and research are led by CRI and SARI, both of which are under CSIR. These institutions collaborate with various CGIAR Centers to access breeding material, notably from CIMMYT, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute of Tropical Agriculture (IITA), the International Rice Research Institute (IRRI), and the International Potato Center (CIP). These collaborations are vital in providing the genetic resources necessary for breeding and improving crop varieties, in addition to locally sourced germplasm, including from landraces.

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<sup>3</sup> New Markets Lab, 'Tanzania Guidebook on Regulatory Aspects of Dissemination of Public Varieties' Seeds2B Africa and Syngenta Foundation for Sustainable Agriculture (2019). See also, John Lynam, 'Evolving a Plant Breeding and Seed System in Sub-Saharan Africa in an Era of Donor Dependence: A Report for the Global Partnership Initiative for Plant Breeding Capacity Building,' Food and Agriculture Organization of the United Nations (2011), <<https://openknowledge.fao.org/server/api/core/bitstreams/a2df089c-7f24-4c46-b54b-bb74d323ddb5/content>>

<sup>4</sup> Juliana Asante-Dartey, 'Ghana Early Generation Seed Study' AGRA-STTP Program (2016), <[https://agrilinks.org/sites/default/files/resource/files/ghana\\_early\\_generation\\_seed\\_report.pdf](https://agrilinks.org/sites/default/files/resource/files/ghana_early_generation_seed_report.pdf)> See also, Mywish K. Maredia and David A. Raitzer, 'CGIAR and NARS Partner Research in Sub-Saharan Africa: Evidence of Impact to Date' Consultative Group on International Agricultural Research, Science Council Secretariat (October 2006), <[https://www.researchgate.net/publication/268425938\\_CGIAR\\_and\\_NARS\\_partner\\_research\\_in\\_sub-Saharan\\_Africa\\_evidence\\_of\\_impact\\_to\\_date](https://www.researchgate.net/publication/268425938_CGIAR_and_NARS_partner_research_in_sub-Saharan_Africa_evidence_of_impact_to_date)>

<sup>5</sup> Katrin Kuhlmann, *et al.*, 'Guide on Flexible Licensing Approaches and Options for NARES' IRRI, CIP, and New Markets Lab Working Paper (Publication Forthcoming). See also, New Markets Lab, 'Tanzania Guidebook on Regulatory Aspects of Dissemination of Public Varieties' Seeds2B Africa and Syngenta Foundation for Sustainable Agriculture (2019) <[https://www.newmarketslab.org/assets/legal\\_guide/8.pdf](https://www.newmarketslab.org/assets/legal_guide/8.pdf)>

<sup>6</sup> *ibid.*

<sup>7</sup> *ibid.*

CSIR operates under the CSIR Act of 1996,<sup>8</sup> which mandates its institutions to engage in research and development, dissemination of findings, and commercialization, often through licensing. In 2021, CSIR formalized its approach to commercialization by adopting an Intellectual Property (IP) Policy<sup>9</sup> aimed at encouraging business development through licensing, technology transfer, and commercialization.<sup>10</sup> The policy emphasizes the protection of IP assets, which includes technologies protected by IP as well as “intellectual assets” that are not covered under IP,<sup>11</sup> their availability to the public, and incentives for innovation.<sup>12</sup> To support this, CSIR has established an IP institutional framework, including an IP office and an IP Management Committee (IPMC) responsible for managing CSIR’s IP assets.<sup>13</sup> This framework covers a range of activities, from reviewing and negotiating agreements to fostering awareness of IP rights.<sup>14</sup> Within CSIR institutions, IP desks have been established, although their capacity varies in practice. CRI has a fully staffed IP desk with a Focal Person, while SARI only has a Focal Person without additional support.

While some NARES in Africa, such as the Kenya Agricultural and Livestock Research Organization (KALRO), National Agricultural Research Organization (NARO) in Uganda, and Zambia Agricultural Research Institute (ZARI), have IP policies in place, the CSIR IP Policy stands out. Unlike the policies of these other NARES, CSIR’s IP policy explicitly mentions its scope to cover all intellectual assets, regardless of whether they are protected by IP rights.<sup>15</sup> This broader approach is particularly important for the commercialization of varieties through licensing, as it does not restrict licensing to only those varieties with IP protection. This flexibility is not always the case with other NARES policies, such as the one in Tanzania, where the licensing framework strictly applies only to protected varieties.<sup>16</sup> There are currently no CSIR plant varieties protected by PVP, although eight applications are pending before the PVP office. For many countries, including Ghana (and Tanzania, despite its policy), few public varieties are covered under IP. By adopting a flexible approach, CSIR can increase the pool

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<sup>8</sup> Council for Scientific and Industrial Research Act 521 of 1996 <<https://faolex.fao.org/docs/pdf/gha93490.pdf>>

<sup>9</sup> Council For Scientific and Industrial Research Intellectual Property (CSIR IP) Policy, 2021, <[https://csir.org.gh/images/new/csir\\_media/docs/csir%20ipr%20policy%20truncate-1-9.pdf](https://csir.org.gh/images/new/csir_media/docs/csir%20ipr%20policy%20truncate-1-9.pdf)>

<sup>10</sup> Clause 2 of the CSIR IP Policy.

<sup>11</sup> ‘Intellectual Assets’ means any results or products of research and development activities of any nature whatsoever (including, but not limited to, knowledge, publications and other information products, databases, improved germplasm, technologies, inventions, know-how, processes, software, and distinctive signs), whether or not they are protected under IP Rights. See, ‘CGIAR Principles on the Management of Intellectual Assets’ (CGIAR IA Principles) 7 March 2012, <<https://cgspace.cgiar.org/server/api/core/bitstreams/26798234-0838-4fde-85af-731bab99831a/content>>

<sup>12</sup> Clause 3 of the CSIR IP Policy.

<sup>13</sup> Clause 6 of the CSIR IP Policy.

<sup>14</sup> *ibid.*

<sup>15</sup> Clause 5(a) of the CSIR IP Policy.

<sup>16</sup> Section 18(2) of the TARI Act. Regulation 33(2) of the TARI Regulations. See also, Katrin Kuhlmann, *et al.*, ‘Synthesis Report on TARI’s Licensing of Public Plant Varieties’ CIMMYT, CGIAR & New Markets Lab (January 2024), <<https://cgspace.cgiar.org/server/api/core/bitstreams/0b0e839b-8d0f-42ac-b240-048705d1165c/content>> See also, Katrin Kuhlmann, *et al.*, ‘Licensing as a commercialization strategy to improve varietal adoption in Tanzania [Brief]’ CIMMYT, CGIAR & New Markets Lab <<https://hdl.handle.net/10883/34592>>

of varieties available for licensing, broadening access for private sector stakeholders and enhancing the potential for generating royalty income.<sup>17</sup>

The CSIR IP Policy outlines procedures for disclosing intellectual assets and clarifies the ownership of IP and intellectual assets, which may be held solely by CSIR or jointly with other partners.<sup>18</sup> It also defines the distribution of revenues generated from licensing agreements. According to the policy, revenue is distributed as follows: 55% to the innovators, 10% to corporate CSIR, 20% to the relevant CSIR institute, 5% to the CSIR IP office, and 10% to the IP fund.<sup>19</sup> These provisions shape licensing agreements, determining which technologies are available for licensing and the distribution of benefits among stakeholders. The benefit-sharing structure ensures that breeding teams are compensated for their research efforts, thereby providing further incentives for innovation and expanding the variety pool available to farmers.<sup>20</sup>

The CSIR Act and IP Policy together provide a solid foundation for licensing technologies through CSIR umbrella institutions (see Table 2 below). CRI, in particular, has developed a standard licensing agreement template, which grants exclusive and transferable rights to licensees for producing, marketing, and selling certified seed of licensed plant varieties within Ghana and abroad (the latter with prior approval).<sup>21</sup> The inclusion of exclusive licenses in CRI's agreements is an interesting licensing strategy, as it requires careful consideration of the licensee's capacity to make the variety available to the wider public.<sup>22</sup> Exclusivity could limit the variety's reach, especially if the licensee is unable to produce sufficient quantities or chooses to prioritize its own competing varieties.<sup>23</sup> This concern has led other NARES, like KALRO, to shift from exclusive to non-exclusive licenses, while NARO has adopted a limited exclusivity model, licensing varieties to a maximum of four licensees after careful consideration of their market reach and general capacity.<sup>24</sup>

The decision to issue exclusive licenses requires balancing the private sector's desire for market control with the public mandate of ensuring widespread availability of improved varieties to farmers.<sup>25</sup> Exclusivity, while attractive to licensees, can create bottlenecks in variety

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<sup>17</sup> New Markets Lab, 'Licensing of Public Plant Varieties: The Case of KALRO' Seeds2B and USAID (January 2024), <[https://www.newmarketslab.org/assets/case\\_studies/4.pdf](https://www.newmarketslab.org/assets/case_studies/4.pdf)> See also, New Markets Lab, 'Case Study on KALRO Model Plant Varieties Licensing Agreement' Seeds2B and USAID (January 2020), <[https://www.syngentafoundation.org/sites/g/files/kgtny976/files/document/sites/g/files/zhg576/f/2020/04/15/kalro\\_model\\_licensing\\_agreement\\_case\\_study\\_20\\_feb\\_2020.pdf](https://www.syngentafoundation.org/sites/g/files/kgtny976/files/document/sites/g/files/zhg576/f/2020/04/15/kalro_model_licensing_agreement_case_study_20_feb_2020.pdf)> See also, Katrin Kuhlmann, *et al.*, 'Guide on Flexible Licensing Approaches and Options for NARES,' IRRI, CIP, and New Markets Lab Working Paper (2024) (Publication Forthcoming).

<sup>18</sup> Clause 9 of the CSIR IP Policy.

<sup>19</sup> Clause 11 of the CSIR IP Policy.

<sup>20</sup> Katrin Kuhlmann, *et al.*, 'Guide on Flexible Licensing Approaches and Options for NARES' IRRI, CIP, and New Markets Lab Working Paper (2024) (Publication Forthcoming).

<sup>21</sup> Clause 2 of the CSIR-CRI Licensing Agreement Template grants the licensee a "transferable, exclusive, fixed term, revocable, royalty bearing license..."

<sup>22</sup> *ibid.*

<sup>23</sup> *ibid.*

<sup>24</sup> Katrin Kuhlmann, *et al.*, 'Guide on Flexible Licensing Approaches and Options for NARES' IRRI, CIP, and New Markets Lab Working Paper (Publication Forthcoming).

<sup>25</sup> *ibid.*

distribution if the licensee lacks production capacity or chooses not to prioritize the public variety in preference to its own competing varieties. In contrast, non-exclusive licenses allow multiple parties to propagate and distribute the varieties, ensuring wider reach and availability. CRI’s use of exclusive licensing has not been without challenges, and consultations revealed that CRI has now changed its approach and is issuing both exclusive and non-exclusive licenses, even though its standard template calls for exclusivity.

Another aspect of CRI’s licensing template that warrants attention is the provision allowing licensees to sublicense rights to third parties.<sup>26</sup> While sublicensing can help expand production and distribution through out-growers and seed dealers, it poses the risk of loss of control over the quality and traceability of the licensed seed. NARES must strike a delicate balance between granting licensees flexibility and ensuring that seed quality is maintained, especially by sublicensees with whom they have no contract. Some NARES, such as KALRO and NARO, have opted not to allow sublicensing, instead issuing non-exclusive licenses to multiple licensees to leverage the benefits of scale.<sup>27</sup> Where sublicensing is permitted, it may be prudent for NARES to require prior approval for any sublicensing agreements to ensure that these align with the broader interests of the licensing institution and uphold seed quality standards.<sup>28</sup> This consideration is currently missing in CRI’s licensing agreement, which requires licensees only to report sublicenses and revenues generated from these arrangements, without offering a mechanism for pre-approval.<sup>29</sup>

**Table 2: Legal and Regulatory Instruments Governing Licensing by CSIR**

<b>Instrument</b>	<b>Year</b>	<b>Primary Contribution</b>
<b>A. Laws</b>		
CSIR Act	1996	Establishes CSIR and provides for conducting, promotion, and regulating research and technology, as well as other related matters.
Plant Variety Protection Act	2020	Provides for granting and protecting plant breeders’ rights and other related matters.
Plants and Fertilizer Act	2010	Provides for the regulation of plants, including quality control of seeds, protection from pests and diseases, and importation and exportation of plant material.
<b>B. Regulations</b>		
Plant Variety Protection Regulations	2022	Provides guidance on the implementation of the Plant Variety Protection Act.
Seeds (Certification and Standards) Regulation	2014	Provides guidance on the provisions related to seed under the Plant and Fertilizer Act.
<b>C. Guiding Instruments</b>		

<sup>26</sup> Under Clause 2 of the CSIR-CRI Licensing Agreement Template, the rights under the license are transferable. Clause 5.4.1 of the CSIR-CRI Licensing Agreement Template includes information about the sub-licensee that the licensee should share with the licensor.

<sup>27</sup> *Supra* note 17.

<sup>28</sup> Katrin Kuhlmann, *et al.* “Guide on Flexible Licensing Approaches and Options for NARES” IRRI, CIP, and New Markets Lab Working Paper (2024) (Publication Forthcoming).

<sup>29</sup> Clause 5.4.1 of the CSIR-CRI Licensing Agreement Template includes information about the sub-licensee that the licensee should share with the licensor post sublicensing.

<b>National Seed Policy</b>	2013	Provides policy priorities and strategies for the country and includes encouragement of commercialization of publicly-bred varieties.
Intellectual Property Policy	2021	Provides for regulation of CSIR intellectual assets and their protection and dissemination for the benefit of the public, along with approaches to encourage creativity.
CRI Licensing Agreement Template		Model agreement with CRI's terms for issuing licenses to prospective licensees

Source: New Markets Lab, 2025.

To date, plant variety licensing agreements have only been issued by CRI under CSIR, with no such agreements signed by SARI. However, SARI has entered into non-binding and royalty-free cooperation memoranda of understanding (MoUs) for the transfer of agricultural technologies, the most recent of which was signed in August 2024 with several public research institutions and a few seed companies.<sup>30</sup> CRI's licensing efforts began in 2016, when it issued four licenses for maize and tomato varieties. These agreements were later terminated due to the inactivity of the licensees. CRI resumed licensing in 2022, issuing six exclusive licenses for maize and tomato varieties. In 2024, following capacity building training on licensing provided by NML and CIMMYT, CRI issued four new licenses, with two additional agreements currently under negotiation (see Table 3 below for details on CRI's licensing history). Notably, there has also been a shift in CRI's approach toward a preference for non-exclusive licenses, reflecting a more flexible and inclusive strategy.

The duration of the licensing agreements varies and is generally between five and ten years, with the specific terms negotiated based on the characteristics of the crops and the interests of the involved parties. These agreements are relatively new, and CRI has not yet collected royalties, as many of the licensees have yet to multiply the licensed varieties. Further, the licensing template includes a two-year grace period before royalty payments are due. However, all licensees have paid a commitment fee at the time of signing the agreement, demonstrating their intent to fulfill the terms and actively engage in the commercialization of the licensed varieties.

Table 3: Crop Varieties and Licenses Issued By CSIR-CRI

SN.	Common Name	Botanical Name	Seed Type	Variety Denomination	License Right	Execution Year	Term	Status
1	Maize	<i>Zea mays</i>	Hybrid	<i>Tintim</i>	Non-Exclusive	2016	5	Expired
2	Maize	<i>Zea mays</i>	Hybrid	Onwanwa	Exclusive	2017	10	Terminated
3	Soybean	<i>Glycine max</i>	Self	Latara	Exclusive	2017	10	Terminated
4	Soybean	<i>Glycine max</i>	Self	Gyidie	Exclusive	2017	10	Terminated
5	Maize	<i>Zea mays</i>	Hybrid	CRI-Nkwagye	Exclusive	2022	10	Active
6	Maize	<i>Zea mays</i>	Hybrid	CRI-Abebe	Exclusive	2022	10	Active

<sup>30</sup> Albert Futukpor, 'CSIR-SARI and Partners Sign MoU to Promote Technology Transfer in Agriculture' August 2024 <<https://gna.org.gh/2024/08/csir-sari-partners-sign-mou-to-promote-technology-transfers-in-agriculture/>>

7	Maize	<i>Zea mays</i>	Hybrid	CRI-Mamaba	Exclusive	2022	10	Active
8	Maize	<i>Zea mays</i>	Hybrid	CRI-Etubi	Exclusive	2022	10	Active
9	Tomato	<i>Solanum lycopersicum</i>	Self	CRI-Kwabena Kwabena	Exclusive	2022	10	Active
10	Tomato	<i>Solanum lycopersicum</i>	Self	CRI-KOPIA	Exclusive	2022	10	Active
11	Maize	<i>Zea mays</i>	Hybrid	CRI-Apraku	Non-Exclusive	Sep-24	5	Active
12	Maize	<i>Zea mays</i>	OPV	<i>Abontem</i>	Non-Exclusive	Sep-24	6	Active
13	Rice	<i>Oryza sativa</i>	Self	<i>CRI-Agyapa</i>	Non-Exclusive	Sep-24	7	Active
14	Rice	<i>Oryza sativa</i>	Self	CRI-KAFACI	Non-Exclusive	Sep-24	8	Active
15	Maize	<i>Zea mays</i>	Hybrid	CRI Ewool	Non-Exclusive	On-going	10	Not yet
16	Maize	<i>Zea mays</i>	Hybrid	CRI Harvest Plus	Non-Exclusive	On-going	10	Not yet

Source: New Markets Lab (information sourced from CRI PVP Desk, 2024)

It is noteworthy that none of the focus crops under the AVISA project have been licensed to date. These crops have been previously categorized as "neglected," which are characterized by limited available varietal options and minimal promotion. This has resulted in a lack of interest from seed companies to market them. This issue is explored in greater detail in the following section, along with corresponding recommendations to address these challenges.

## II. Current Challenges with Administering Licensing Agreements

In March and June of 2024, NML, in collaboration with CIMMYT, CSIR-CRI, and SARI, organized a series of training workshops focused on licensing and intellectual assets/intellectual property. The workshops were designed to provide participants with a comprehensive understanding of licensing agreements, covering key considerations for NARESS as licensors and seed companies as commercial entities, as well as the regulatory frameworks governing licensing. Attendees included breeders, the CRI and SARI management team, CRI IP desk representatives, IP focal points from CRI and SARI, legal representatives from CSIR headquarters, and a representative from the PVP registrar's office. Through in-depth engagement with CRI and SARI, and virtual discussions with seed companies, several challenges and opportunities related to CRI and SARI's licensing strategies were identified, as discussed in detail below.

### A. Limited Knowledge and Capacity to License

A thorough understanding of licensing concepts is crucial for ensuring that all parties' interests are appropriately represented and safeguarded within a licensing agreement. Effective licensing agreements require clarity regarding the roles, obligations, and benefits of each party, as well

as a mutual understanding of the terms involved.<sup>31</sup> Without this foundational knowledge, gaps often emerge in both compliance and implementation, undermining the intended outcomes of the agreement.<sup>32</sup> Stakeholder consultations, including workshops conducted by NML, have highlighted significant knowledge gaps regarding licensing practices, particularly within the private sector and among breeders at CRI and SARI. For instance, many breeders were unaware that CRI had previously issued licenses for varieties, nor were they familiar with the existence of CSIR's IP management framework. This lack of awareness points to an insufficient understanding of the processes and benefits associated with licensing. The licensing workshops by NML revealed that the legal representatives from CSIR, CRI, and SARI were not conversant with plant variety licensing agreements, which differ significantly from normal contracts. They were also unaware of PVP frameworks and how they apply to licensing. This lack of expertise further exacerbates the challenges in properly navigating the licensing process.

CRI had predominantly issued exclusive licenses in the past, largely in response to private sector preferences, without fully considering the broader implications for its public breeding mandate or the potential impact on farmers' access to improved varieties. This practice has led to a disconnect between the public research institutions' objectives and the realities of market access, underscoring the need for a more informed and strategic approach to licensing.

## B. Limited Private Sector Capacity

The seed industry in Ghana has traditionally been dominated by the government, resulting in an underdeveloped private sector. Most local seed companies are small, often emerging from donor-funded projects, and they lack sustainable business plans. These companies face significant challenges in infrastructure, finance, and human resources, preventing them from independently producing EGS.<sup>33</sup> As a result, they rely on informal channels, often based on personal relationships with breeders, rather than formal licensing agreements. Additionally, many seed companies expect to receive project-funded resources without financial commitment, further limiting their capacity to engage in formal business practices, such as licensing. This mindset has hindered their ability to view seed production as a sustainable business and has restricted their full participation in the licensing process, stalling both their growth and the broader development of the seed sector.

## C. Limited Availability of EGS Supply through Informal Routes

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<sup>31</sup> Katrin Kuhlmann, *et al.*, 'Guide on Flexible Licensing Approaches and Options for NARES' IRRI, CIP, and New Markets Lab Working Paper (2024) (Publication Forthcoming), 16.

<sup>32</sup> *ibid.*

<sup>33</sup> Seed Trade Association of Ghana, 'Barriers to Effective Seed Trade in Ghana and West Africa Sub-region: A Technical Report for the National Seed Trade Association of Ghana' (2013) <<https://www.nastag.org/docx/reports/NASTAG%20Barriers%20to%20Effective%20Seed%20Trade.pdf>>

Consultations highlighted a significant challenge in the supply of EGS at both CRI and SARI, where an established and efficient process for EGS distribution is notably absent.<sup>34</sup> Access to EGS is often contingent upon personal connections and informal channels rather than a transparent and systematic process, creating inconsistencies and inefficiencies in its supply. Compounding this issue are the financial, infrastructural, and human resource limitations within both institutions, which result in production of EGS that is far below the demand from the private sector. Consequently, available supply fails to meet the needs of seed companies and other stakeholders, who rely on timely access to quality basic seed. Moreover, in some instances, breeder or parent lines necessary to produce licensed varieties are missing or incomplete, further hindering the ability to supply the full range of varieties promised under licensing agreements. When companies are unable to access basic seed – the core component of the licensed product – the licenses themselves become effectively unenforceable. This failure to supply the requisite EGS undermines the purpose of licensing agreements, rendering them ineffective and stalling the commercialization and distribution of improved varieties. Consequently, this gap in the EGS supply chain not only compromises the potential for expanding seed availability but also weakens the credibility and impact of public sector breeding programs.

#### D. Limited Knowledge of PVP and Challenges in Meeting Protection Requirements

The legal framework for PVP in Ghana is relatively new, and the PVP Act was passed in 2020,<sup>35</sup> with regulations following in 2022. As a result, there is still limited awareness and understanding of PVP among many breeders and public research institutions. Many breeders, particularly those at public institutions, view public varieties as communal assets, which often leads them to overlook the importance of protecting intellectual assets or IP. This lack of understanding can hinder the ability to fully capitalize on the economic potential of plant varieties,<sup>36</sup> even though considerations of public good are important. Notably, protected varieties generally command higher royalties and offer more security for private sector entities, as they provide legal recourse in cases of unauthorized use or infringement.

For a variety to qualify for protection under the PVP framework, it must meet DUS and novelty requirements.<sup>37</sup> However, many of the varieties currently under development or in use by public institutions such as CRI and SARI are older and, as such, do not meet the "novelty" requirement for protection, even though they might have more market viability than new ones. Additionally, Ghana's PVP system lacks established DUS protocols for most crops, and only

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<sup>34</sup> *ibid.*

<sup>35</sup> Plant Variety Protection Act of Ghana 2020.

<sup>36</sup> Katrin Kuhlmann, *et al.*, 'Synthesis Report on TARI's Licensing of Public Plant Varieties' January 2024, available at: <<https://cgspace.cgiar.org/server/api/core/bitstreams/0b0e839b-8d0f-42ac-b240-048705d1165c/content>>. See also, "Licensing as a Commercialization Strategy to Improve Varietal Adoption in Tanzania" AVISA Policy Brief (April 2024), available at: <<https://cgspace.cgiar.org/server/api/core/bitstreams/a0e0fbd9-d7c9-4cf7-a726-372cce7018a3/content>>.

<sup>37</sup> Plant Variety Protection Act of Ghana 2020, Sections 4, 5, 6, and 7.

a few crops, such as tomato, rice, and maize, have formalized protocols. Without these standardized protocols, it is impossible to conduct the necessary DUS tests to evaluate whether a variety meets the requirements for protection.

Moreover, the PVP process itself is costly, with not only application and evaluation fees but also annual renewal charges.<sup>38</sup> These financial barriers create challenges for institutions like CRI and SARI, which already face resource constraints. As a result, they may be unable to afford protection for the varieties they develop. In practice, this means that institutions must be strategic in selecting which varieties to protect, focusing on those that have proven market viability and are likely to attract interest from the private sector for licensing, while keeping the others under non-PBR-based licensing.

For varieties sourced from CGIAR Centers and evaluated for release without additional developments to them, CRI and SARI could consider engaging with the respective CGIAR Center. Consultations and engagement during the workshop revealed stakeholder confusion regarding NARES' interest in varieties sourced from CGIAR Centers. Seed companies believed these materials are available open access, while breeders in CRI and SARI asserted that they were NARES varieties the moment the CGIAR Centers handed them over to the NARES. While CGIAR rules and principles could shed some light on these issues, a more strategic approach to collaboration with international partners, such as CGIAR centers, is clearly needed. This could involve sharing expertise and resources in developing varieties and a common position related to intellectual assets and IP in the context of licensing in order to ensure that a wider pool of improved varieties becomes available, along with greater opportunities for licensing and private sector involvement.

## E. Limited Investment in Promotion of Improved Varieties

The lack of sustained funding and a coordinated effort to promote newly developed varieties significantly limits their visibility and market uptake. Consultations revealed that AVISA focus crops are particularly affected, with farmers continuing to rely on older varieties, unaware of the existence of newer, improved varieties. Some of these crops are open-pollinated varieties (OPVs), for which farmers prefer to save seed for future seasons. Seed companies, in turn, are often hesitant to pursue licensing agreements for OPVs, perceiving them as lacking consistent, repeatable market demand. This perception is further compounded by breeders' emphasis on the technical aspects of breeding, often neglecting the crucial task of promotion necessary to drive adoption.

While there have been efforts to popularize AVISA crops in Ghana under the AVISA project, particularly by SARI, it is still too early to assess the impact on market uptake or interest in licensing. Some seed companies expressed interest in obtaining licenses for certain sorghum varieties bred by SARI, but this interest did not materialize, largely due to SARI's institutional

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<sup>38</sup> Plant Variety Protection Act of Ghana 2020, Section 31.

unreadiness to follow up on licensing discussions. Seed companies, being profit-oriented, are more likely to invest and commit to licensing agreements when they are assured a reliable market. The potential market for a variety is a key driver of private sector interest in licensing, making it essential to create conditions that stimulate market demand.

Furthermore, the departments responsible for varietal promotion at CRI and SARI are typically underfunded, relying heavily on short-term, project-based funding that is neither reliable nor sustainable. This lack of consistent financial support for promotional activities places public research institutes at a disadvantage compared to the private sector, which can invest in demonstration farms for its varieties along major roads. In contrast, promotional efforts for public research varieties are largely absent, limiting their exposure and hindering potential adoption by farmers.

## F. Limited Flow of Information Between CSIR and the Private Sector

The limited flow of information between CSIR-CRI and SARI and the private sector presents a significant barrier to identifying and capitalizing on potential licensing opportunities. One of the main challenges is the absence of effective communication channels and a centralized, comprehensive database that provides detailed information on public varieties available for licensing. Without access to critical data (such as specific traits, suitability for various agro-ecological zones, and the licensing status of different varieties), private sector companies are unable to make well-informed decisions regarding potential investments in CRI and SARI licensing programs. As a result, companies may overlook valuable opportunities for collaboration or the commercialization of publicly developed varieties.

In some cases, private sector stakeholders remain unaware that institutions like CRI and SARI are actively open to licensing their varieties. This lack of awareness further exacerbates the disconnect between public research efforts and private sector engagement. Given the potential of public varieties to meet market needs, particularly in terms of resilience to climate change, pest resistance, and yield improvements, this communication gap not only undermines the value of these public assets but also delays the broader adoption of innovations that could significantly enhance agricultural productivity. For successful commercialization, it is crucial to establish clear and efficient channels of communication that ensure the private sector has timely access to all relevant information, enabling informed decisions that benefit both parties and promote the widespread use of public varieties.

## G. Absence of Clear and Formalized Licensing Guidelines

At present, there are no clearly defined licensing procedures outlining the specific requirements that potential licensees must fulfill in general, along with qualification for specific types of licenses, including detailed guidelines on where and how to submit licensing applications. This lack of clarity can lead to confusion among stakeholders and impede the efficient processing

of licensing agreements. Without a standardized process, both public research institutions and private sector stakeholders may face delays, uncertainty, and stalled negotiations, reducing the likelihood of successful collaborations and commercialization of public varieties.

While CRI is in the process of developing comprehensive licensing guidelines, these procedures have yet to be formalized or adopted. As a result, there is a significant gap in the regulatory framework that could otherwise facilitate smooth interactions between the public and private sectors. Until licensing guidelines are fully established and operationalized, the licensing process will continue to lack transparency, potentially deterring potential licensees and limiting the broader impact of public breeding programs.

### III. Recommendations

CSIR has established a commendable foundation for licensing with its IP Policy as a guiding instrument, an institutional framework to implement the IP Policy, an IP office, and IPMC and IP desks and focal persons at individual umbrella institutions. Both CRI and SARI are still in the early stages of licensing, with significant potential for improvement and refinement of their approaches. Effective licensing, and the development of a tailored strategy for licensing, are ongoing processes, and even NARES like KALRO, which has been licensing for over two decades, continue to refine their licensing models. This suggests that the challenges and gaps identified present valuable opportunities for CSIR, CRI, and SARI to further develop and optimize their licensing strategies.

Consultations revealed that many local seed companies in Ghana lack their own breeding programs and remain heavily reliant on public varieties. However, as the private sector continues to grow, some companies are beginning to position themselves to produce EGS, a development that CRI and SARI can capitalize on to advance licensing opportunities. To fully realize this potential, both public research institutions and the private sector, with support from the government and development partners, will need to implement key changes and take decisive actions to strengthen the licensing process and foster more sustainable, market-driven seed production.

#### A. Build Comprehensive Licensing Capacity and Awareness

Engagement in Ghana highlighted that there is limited knowledge and capacity around licensing, and it will be crucial to develop and implement a comprehensive, multi-pronged capacity-building strategy, building upon a model that NML has successfully applied in various countries. Such a strategy, which has shown commendable results in other regions, involves targeted training for key stakeholders on licensing principles, types of licenses, intellectual asset and IP management, and capacity building on licensing “options” to fully assess the associated benefits and risks of various licensing models. In Ghana, capacity building efforts have been initially focused on public sector stakeholders due to limited resources, but it could be expanded and extended to the private sector in the long term.

A key element of NML’s strategy is its “train-the-trainer” approach, which has proven effective in countries like Tanzania. To illustrate, following training from NML, the CRI focal person has since facilitated four additional training sessions for CRI staff in 2024. With greater focus on this approach, additional experts and lawyers could receive training. This model, which empowers local trainers to educate others on licensing, intellectual assets, and IP, has demonstrated its efficacy and could be further expanded to build capacity within the public and private sectors.

Leveraging ongoing capacity-building platforms, such as the one under development by NML on intellectual assets, IP, and licensing, should be prioritized. These platforms will ensure that breeders and other stakeholders have access to continuous, up-to-date, specialized knowledge. The NML digital platform, once finalized, will provide valuable resources and tools, including country-specific annotated licensing agreements, IP policies, guides, case studies, and guidelines on navigating complex legal and regulatory frameworks. Additionally, the platform will include interactive features that allow users to share experiences, develop country-tailored licensing instruments, and access a curriculum designed to deepen understanding of licensing concepts.

Integrating these resources into professional development efforts will help ensure that stakeholders remain informed about evolving licensing practices and intellectual assets/IP management. These tools will enable CRI and SARI to adopt a more transparent and strategic approach to licensing, balancing public good objectives and the long-term impact on farmers’ access to improved varieties with the need to engage the private sector. This could involve adopting licensing models that align with public sector objectives while still addressing private sector interests. By fostering a deeper understanding of licensing and intellectual assets/IP management, this approach will ensure that all parties can make informed, strategic decisions that maximize the potential of public varieties and enhance market access.

## **B. Build Private Sector Capacity to Engage in EGS Production and Licensing**

While Ghana’s private sector for seed is beginning to grow, it will be crucial to shift the attitude of seed companies towards viewing seed production as a legitimate and sustainable business. This can be achieved through greater focus on licensing models and targeted capacity building programs that emphasize the importance of investing in infrastructure, developing sustainable business models, and treating seed production as a commercial enterprise. Seed companies also need training on licensing procedures and options, as well as the benefits of formalizing their operations. Public-private partnerships could be strengthened to provide both financial and technical support, enabling seed companies to build the necessary infrastructure and human resources to produce EGS independently. Moreover, incentives should be introduced to encourage seed companies to move away from a reliance on subsidies and instead embrace a market-driven approach to seed production and licensing. This will foster a more competitive, sustainable seed industry and increase the overall effectiveness of licensing systems.

## C. Improve EGS Supply by CRI and SARI

To address the challenges of limited EGS availability and reliance on informal supply routes, CRI and SARI should prioritize the development of a formal, clear, and streamlined system or guideline for EGS distribution. Central to this system would be the creation of clear guidelines outlining when, where, how, and to whom applications should be logged. This could be supported by a digital platform enabling licensees to place advance orders for EGS, ideally a season ahead of time, and pay a deposit. Such a system would allow CRI and SARI to better gauge demand, plan production, and allocate resources effectively. By improving transparency in the process, such a digital platform would help ensure that EGS allocation is based on real, predictable demand, reducing uncertainty and improving the timeliness of seed delivery.

Strengthening the infrastructure, human resources, and financial capacity within CRI and SARI is crucial for reinforcing the EGS production and supply system. Key investments are needed in dedicated EGS production units, irrigation infrastructure, cold storage facilities for maintaining breeder seed, and laboratories to support quality control. Additionally, ongoing staff training is essential to scale up production and ensure a consistent, reliable supply.

Collaboration with the MOFA and seed companies will be critical for leveraging historical production data and market trends to better predict demand. A data-driven approach would enable CRI and SARI to align supply with market needs more accurately and anticipate the quantity of EGS required each season. By improving seed production planning, these institutions could reduce inefficiencies and enhance responsiveness to market demands.

CRI and SARI should also consider developing a joint formal registry or database to track breeder lines, available parent material, and the status of licensed varieties. Such a registry would allow all stakeholders to monitor EGS availability and ensure that seed companies are not hindered by missing breeder lines or incomplete seed stocks. Establishing a robust monitoring and compliance system would also ensure that licensing agreements are properly executed, with breeders and seed companies fulfilling their obligations.

As stakeholders have noted, securing sustainable financing for all these efforts will also be essential. The government could explore public-private partnerships or other funded opportunities to support the infrastructure and operational costs associated with EGS production. With adequate funding, digital tools, and data-driven planning, the EGS supply chain could be significantly strengthened, ensuring that licensed varieties are consistently available to farmers in a timely manner and facilitating the growth of the seed industry.

## D. Enhance Plant Variety Protection through Capacity Building, Waived Fees, and Strategic Partnerships

Capacity building efforts aimed at educating breeders and public research institutions on the importance of effective management for intellectual assets and intellectual property will be central to successful licensing approaches. This could be done through targeted training programs that highlight how intellectual asset and IP protection could enhance revenue generation through royalties and increase private sector confidence in licensing agreements.

Ghana should also prioritize the establishment of comprehensive DUS protocols for a broader range of crops, including focus crops under the AVISA project, to facilitate the protection process. In addition, policy reform and advocacy could be considered regarding waiving or charging lower registration fees for NARES like CRI and SARI to support PVP registration for public varieties, where appropriate, thus lowering the financial burden associated with registration and annual renewals. This would enable these institutions to protect more varieties and increase the potential for innovation, commercialization, and adoption.

CRI has already applied for the protection of 25 varieties, leveraging the "Recent Creation" clause under the PVP Act. This clause allows varieties released within four years after the passing of the PVP Act to be considered "new," provided that applications for protection are submitted within one year after the law's enactment. This time-restricted flexibility of the novelty requirement offers a valuable opportunity for public institutions to protect varieties that might otherwise not qualify due to their age. Taking advantage of this provision to secure protection for promising varieties that are likely to attract private sector interest is a commendable strategy.

For varieties sourced from CGIAR Centers, CRI and SARI should pursue a more strategic and collaborative approach, to align on positions regarding PVP and licensing. This collaboration should focus on clarifying ownership and rights concerning varieties sourced from CGIAR Centers, ensuring a mutual understanding of the conditions for registration and protection. By leveraging the expertise and resources of CGIAR Centers, CRI and SARI could expand the pool of improved varieties eligible for protection, thus fostering greater opportunities for licensing and encouraging private sector involvement in the development and commercialization of these varieties.

## E. Promote New Public Varieties through Sustainable Investment and Collaboration

To drive the adoption and impact of newly developed public varieties, it is critical that public research institutions, such as CRI and SARI, receive increased and more consistent funding for varietal promotion. This funding should support not only the direct promotion of public varieties but also foster collaborations with private sector stakeholders to share the costs of demonstration and promotion activities. Innovative licensing models, such as offering lower

royalty rates for companies that commit to investing in the promotion of public varieties, could encourage private sector engagement and help expand the reach of these varieties. Government support in the form of incentives for public institutions to develop and execute promotional strategies, including demonstration farms, field days, and marketing campaigns, would further enhance visibility and stimulate interest from both farmers and seed companies. Without sustained investment in varietal promotion, public varieties are at risk of being underutilized, thus limiting their potential impact on agricultural productivity, economic growth, and farmer welfare.

A demand-led breeding approach would help ensure that new varieties meet the evolving needs of the agricultural sector. Breeders must engage closely with farmers, seed companies, and other key stakeholders to tailor new varieties that address critical market demands, such as climate resilience, disease resistance, and consumer preferences. This approach would enhance the likelihood that varieties will be adopted by farmers, as it would ensure that breeding programs remain responsive to real-world challenges. In addition to direct market needs, breeders should collaborate with experts from disciplines such as gender studies, socio-economic analysis, and cultural perspectives to gain a deeper understanding of the diverse needs of both farmers and consumers. By integrating these insights, breeding programs could create varieties that are not only agronomically viable but also socially and economically acceptable, increasing the likelihood of long-term adoption and sustainability.

Programs like AVISA have made significant progress in supporting demand-led breeding, aligning breeding objectives with market needs and improving the relevance of newly developed varieties. However, to build on these successes, there is a pressing need for more consistent and long-term funding. This would allow for the scaling of initiatives that link breeding programs with market realities and farmer preferences. A strategic, sustainable approach to varietal promotion – including ongoing partnerships, market linkages, and strengthened public-private collaboration – will be essential to ensuring that public varieties reach and benefit target communities.

A robust and sustained promotional strategy is especially important for the successful commercialization of new varieties. Ensuring that varieties are market-ready and effectively promoted increases their commercial appeal, making them more attractive to potential licensees. When combined with innovative licensing strategies, such as those that offer incentives for private sector investment in varietal promotion, this approach could foster a more dynamic and sustainable licensing ecosystem. By increasing the visibility of public varieties and aligning promotion efforts with market demand, public research institutions could create a strong foundation for licensing agreements, ultimately ensuring that the benefits of public research are widely disseminated and lead to significant economic impact.

## F. Strengthen Communication and Data Sharing Between CSIR and the Private Sector

To address the limited flow of information between CSIR and the private sector, it will be essential to establish clear, structured communication channels and a centralized, accessible database on public varieties. Such a platform should be digitized to provide detailed, up-to-date information on variety traits, suitability for different agro-ecological zones, and licensing status, making it easier for stakeholders to access and navigate data. A digital platform would enable faster and more efficient sharing of information, breaking down geographic and logistical barriers that might otherwise hinder timely access to critical data.

Additionally, CSIR institutions like CRI and SARI should actively engage with the private sector through regular outreach and information-sharing initiatives, such as industry workshops, digital newsletters, and partnership forums. These efforts would raise awareness that public varieties are available for licensing, fostering stronger collaboration and encouraging private sector investment in public research outputs. By improving transparency and access to critical data, especially through a digitized platform, the potential for commercialization and the broader adoption of public varieties would be significantly enhanced, creating a more dynamic and responsive agricultural innovation ecosystem.

## G. Establish a Clear and Standardized Licensing Framework

To address the lack of clearly defined licensing procedures, CRI should expedite the formalization and adoption of comprehensive licensing guidelines. These guidelines could clearly outline the specific requirements for licensees, including detailed instructions on how and where to submit licensing applications. To ensure consistency and improve efficiency, guidelines should be developed in collaboration with SARI and adopted by both institutions. This would harmonize the licensing procedures across these key research bodies, promoting a more unified approach to licensing public varieties.

Once formalized, CRI and SARI should actively communicate the guidelines to potential licensees through workshops, informational sessions, and an online platform, ensuring that all stakeholders are well-informed and able to navigate the licensing process with ease. By harmonizing and streamlining licensing procedures, both institutions would foster greater collaboration with the private sector, ultimately enhancing the commercialization and adoption of public varieties.

## IV. Conclusion

The licensing of public varieties by CSIR in Ghana represents a promising strategy for enhancing agricultural productivity and ensuring that improved crop varieties reach the farmers who need them most. While significant progress has been made in reinitiating and expanding

the licensing program, several challenges hinder its full effectiveness. These include gaps in institutional capacity, limited understanding of licensing procedures, and a lack of clear communication between CSIR and the private sector. Addressing these challenges will require a comprehensive approach that includes targeted capacity building, better infrastructure for EGS supply, and the establishment of clear, standardized licensing guidelines.

By strengthening public-private partnerships, improving the technical and legal expertise of stakeholders, and creating better pathways for seed companies to engage with the formal licensing process, Ghana could unlock the full potential of its agricultural innovations. The recommendations outlined in this report offer a roadmap for overcoming these barriers, which could ultimately lead to greater adoption of improved crop varieties, enhanced food security, and a more robust agricultural sector in Ghana. With sustained investment and collaboration, the licensing of public varieties could become a key driver of agricultural growth and rural development, benefiting both farmers and the broader economy.