

A Business Case for the Tomato Value Chain in Ghana: A Journey Towards Self-Sufficiency

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Acknowledgement

This business case document was developed after 3 days of stakeholder consultation at a workshop organized by the West Africa Centre for crop Improvement (WACCI), University of Ghana, Legon in Accra from October 26-28, 2022 at the Fiesta Royal Hotel, Dzorwulu. The participating stakeholders were the University of Professional Studies, Accra (UPSA), Eventzpro Consult Limited, Biotechnology and Stewardship for Sustainable Agriculture in West Africa (BSSA), Council for Scientific and Industrial Research-Crops Research Institute, National Seed Traders Association of Ghana (NASTAG), Ministry of Food and Agriculture (MoFA), Agromite Limited, Calli Ghana Limited, Ghana Incentive-Based Risk-Sharing System for Agricultural Lending (GIRSAL), Ghana National Tomato Traders and Transporters Association (GNTTTA). We would like to thank all stakeholders for the valuable contributions.

The organizers would also like to acknowledge the kind support of the Alliance for Food Security formed by the Australian Centre for International Agricultural Research (ACIAR), the Crawford Fund and the Syngenta Foundation for Sustainable Agriculture (SFSA) and all partners of the Demand Led Breeding project



Executive Pitch

The Business Opportunity

In Ghana, tomato is an indispensable ingredient in the daily diet of people across all regions. Alone, it accounts for 40% of total vegetable expenditure. The tomato value chain in Ghana has a market size estimated in excess of US\$1 billion annually with sub-markets for seeds, agricultural input/implements, haulage, aggregations, tomato concentrate production and sales, tomato mix production as well as tomato puree/ketchup production and sale. Fresh tomato demand is estimated to be approximately 2.7 million MT/annum (with estimated market size in excess of US\$537.5 million if we were to locally produce all that we consume) thereby creating a prospective seed market in excess of US\$5.8 million per annum. Given the existing and growing demand for tomato mix, puree and ketchup that has resulted in huge volumes of imported tomato products, more than 519,000 MT of tomato concentrates with brix levels between 36-38 should be produced and sold to local processors each year to substitute importation of such products. The size of this market is estimated in excess of US\$460 million per annum with massive business opportunities existing for transporters and distributors.

The Business Case for the Tomato Industry

To date, the industry has operated with a dysfunctional value chain that has created so many leakages thereby causing industry players to operate far below their optimal levels. The effect is a high import bill for tomato and tomato products that could have otherwise been produced locally. Thus, by directing the right volume of investments to this sector, return on investment will be guaranteed with evidence of high scalability. With three dormant fresh tomato processing factories in Ghana and one new factory operating below capacity, it has become evident that once raw material sourcing issues are addressed and adequate working capital is provided, all four indigenous tomato processing factories could operate at full scale with opportunities for expansion. Imagine the impact on currency stability if import bill of US\$1 billion is retained in the local economy each year? The direct impact on income tax revenue mobilization for the state would be immense and the stability of the currency will positively ripple across all sectors of the economy. A demand driven solution for the tomato value

chain is, therefore, an ideal approach to developing a lasting solution that drives businesses across the value chain profitably. Left unstructured and unsupervised, value chain actors in their state of rational economic entities will continue to exploit profit opportunities with limited recourse to the ultimate impact on local food security, job creation, macro-economic growth and stability.

The Critical Success Factors

Value chains work best when the end products generating revenues/incomes are large enough and consistent all-year-round. Hence, to make value chains work effectively, it has to be demand – driven. Exploitation of identified opportunities in the tomato value chain is long overdue and immediately requires the establishment of an Integrated Tomato Value Chain Company Limited (ITVCL) to serve as a recognized apex body for the tomato value chain with supervisory authority over all value chain actors. Such that among others, it would spearhead design and implementation of integrated programmes and strategies that would ensure seamless functioning of the tomato value chain profitably.

The Investment Appeal

An appeal is hereby made to development partners to fund critical pre-establishment activities required to facilitate the incorporation and corporate launching of the ITVCL within 12 months. Furthermore, commercial entities along the value chain and within the financial sector should strategically position themselves to hold a financial stake in this new entity as it promises very attractive returns on investment.



PART ONE:

Introduction

1.1 Tomato industry in Ghana

Tomato remains one of the most cultivated and consumed vegetables in Ghana. It is an indispensable ingredient in the daily diet of people across all regions, accounting for 40% of total household outlay on vegetables (van Asselt et al., 2018). Tomato is key to the health and nutrition of Ghanaians, being an important source of vitamins, minerals, antioxidants and fibre. Its cultivation is also more profitable than many other staple food crops grown across the country (Ochieng and Sharman, 2005). Approximately 440,000 MT of tomatoes were produced in 2020 on a total land area of 53,700 hectares (SRID, MoFA).

A rural-based smallholder production predominates the sub-sector, accounting for 80% of total output. As such, their participation in commercial market holds considerable potential for unlocking suitable opportunities necessary for providing better incomes and sustainable livelihoods. Commercial production is intense in the Bono, Bono East, Ahafo, Ashanti, Volta, Eastern, Greater Accra and Upper East Regions of Ghana (figure 1) which supply the market at various times of the year. Most of the production is done in the main rainy season (usually from April to September). Production is largely carried out on family land and/or rented lands of relatively small sizes (0.4 – 1.2 hectares) with limited activities of medium to large scale farmers. The national average yield under rainfed conditions is estimated between 7.5 – 10 MT/ha as against easily achievable yields of 20 MT/ha.

Farmers occupy the same piece of land for several years and leave when they realize decrease in yields. Some varieties grown include Raja F1, Cobra 34 & 26, Sultan, Petomech, Roma VF, Laurano, Raki, Gigantic, Power Rano, Rasta, Italy and Heinz, Jorad and Amira. Some varieties grown in greenhouses include Eva, Titanium, Umagna and Valuro. A critical issue of concern is that the seeds of all these varieties are imported, though most farmers often extract seed for planting with lower

yields and associated challenges such as spreading seed borne diseases.

Tomato production in Ghana is highly seasonal, reflecting differences in access to water and rainfall patterns. Tomato from 'farm to fork' is handled by a number of actors (figure 2) which include the farmers who produce, market queens, middlemen, "loading boys" (when loading on farm and when offloading at the market centres), sorters, drivers'/transport operators, the wholesalers and retailers before it reaches the consumer. Over 90,000 farmers were estimated to be involved in production and more than 300,000 individuals in retail and wholesale areas of tomatoes (Robinson and Kolavalli, 2010) with annual growth rate in the industry corresponding to the population growth rate.

Despite favourable growing conditions for its production, its importance for food and nutrition security, job creation and government support for the sector, national production has not increased much over the past decades. This has resulted in domestic supply falling short of demands. Thus, Ghana relies heavily on the imports of fresh tomatoes from Burkina Faso, Netherlands and South Africa while processed tomatoes mainly from China and Italy. It is estimated that Ghana imports between 42,000 – 100,000 MT/year of fresh tomatoes from neighbouring Burkina Faso from the months of December to May where local production would have reduced drastically. Substantial quantities of tomatoes enter the country informally which makes estimating actual import data difficult yet, the Ministry of Trade and Industry estimates that the importation of tomato concentrates was 36,578 MT in 2020 (MoTI, 2020). Tomatoes are highly perishable, and this challenge poses significant risk to producers and traders. Post-harvest handling, transport, storage, and processing losses have been estimated at between 20% and 65% of production (Vowotor et al., 2012).

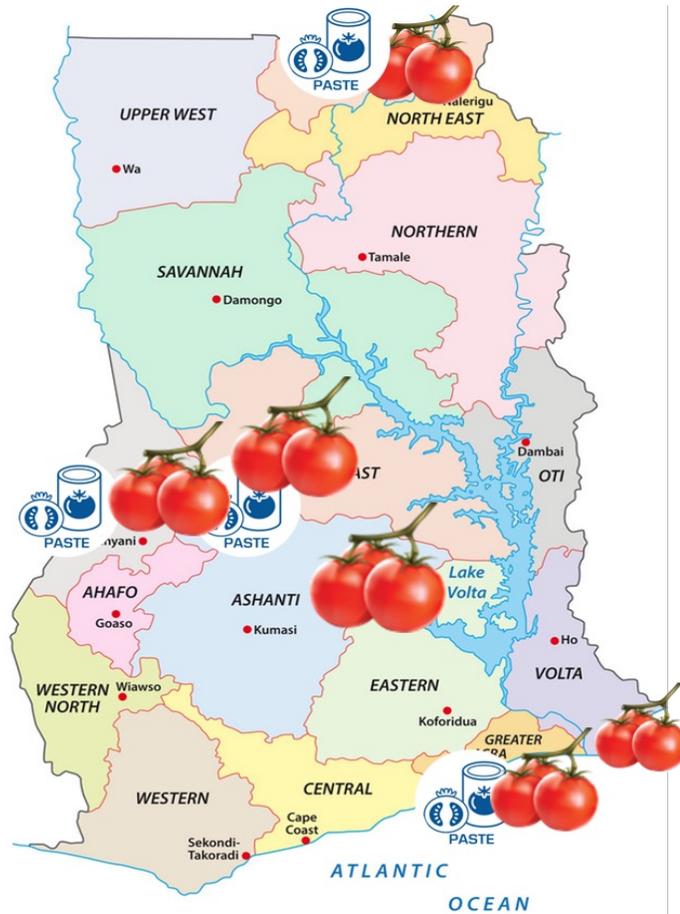


Figure 1: Locational Map of Tomato Growing Centres in Ghana

The map shows the predominant regions that are known for producing tomatoes and those regions with fresh tomato processing factories. Source: MoFA and GNTTTA

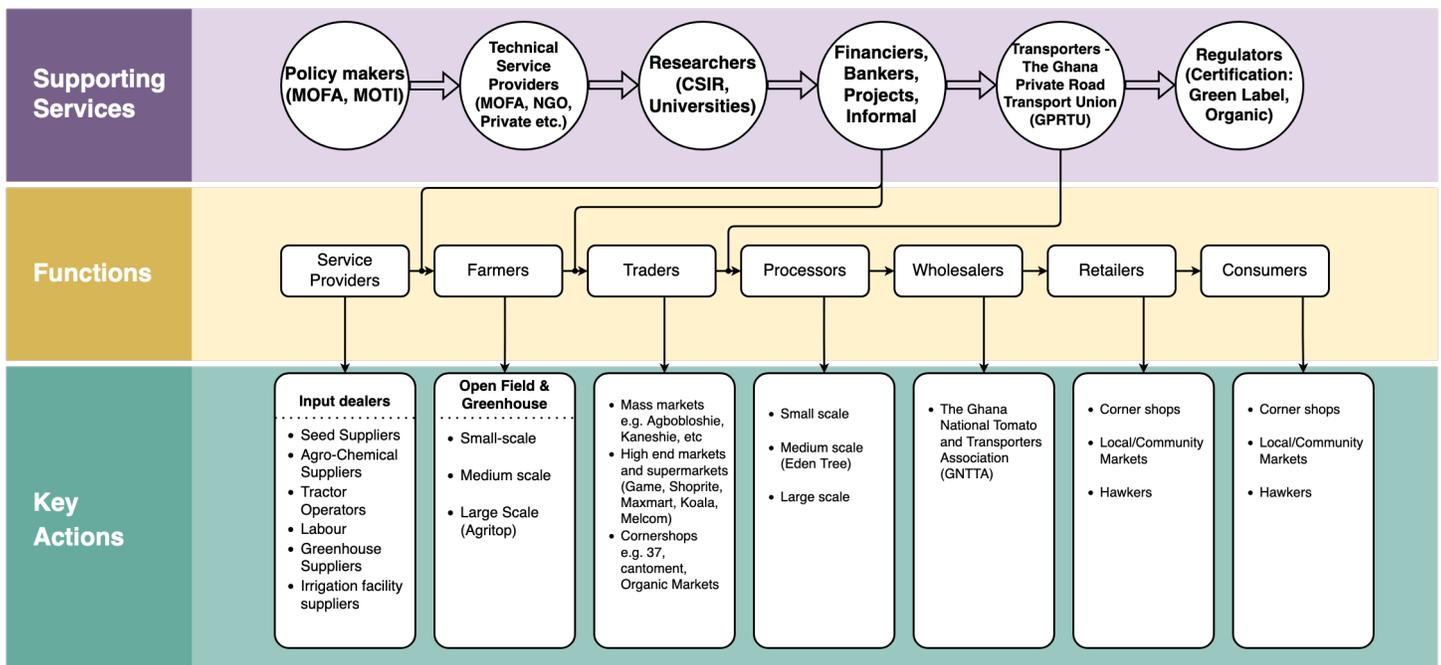


Figure 2: Value chain mapping and key actors
Tomato value chain canvas, Source: MoFA, 2020

1.2 Background of the Business Case

A demand driven solution for any value chain is the most ideal approach to developing a lasting solution that drives businesses across the chain. Left unstructured and unsupervised, value chain actors in their state as rational economic entities will continue to exploit profit opportunities with limited recourse to the ultimate impact on local food security, job creation, macro-economic growth and stability. Thus,

- i. Scientists for instance with limited funding would move their attention to other areas thereby leaving tomato seed varieties underdeveloped.
- ii. Seed traders would have no option but to import superior seeds to fill the local demand gap thereby putting pressure on the local currency (Ghana Cedi) while putting food security and food sovereignty at risk as a result of the dependence on foreign firms to supply the country with adequate seeds at the right time.
- iii. Transporters and traders of fresh tomatoes will constantly be attracted to move across the border to import fresh tomatoes into the country thereby putting pressure on the local currency (Ghana Cedi), risking food availability, and also depleting job opportunities for the youth in vegetable farming since the market for such produce is shifted to foreign farmers.
- iv. Agro-input suppliers will focus attention of their resources (working capital) on inputs that 'move faster' (inputs with higher inventory turnover). This could create a situation whereby tomato cultivation for instance may lose-out against cash crops like cocoa which has a more organized value chain. As a result, yields of tomato farms will drop and worsen food security risk with attendant effect on inflation, exchange rate and general cost of living in Ghana.
- v. Farming tomatoes would be very unattractive because, there will be limited access to the right seed varieties, limited access to the right calibre and quantity of inputs. Considering the perishable nature of the tomato fruit amidst all these challenges, post-harvest losses will accrue especially given the absence of an active fresh tomato processing industry. The impact on general food prices would worsen as fresh tomato consumption is a staple in Ghana.
- vi. The absence of a proven reliable fresh tomato supply chain in Ghana has accounted for the collapse of three tomato processing companies in Pwalugu, Wenchi and Techiman, and continue to contribute to the application of a business model in the processing industry that imports tomato concentrates from

mostly China and sometimes Italy for onward processing/formulation into finished products (tomato mix, tomato puree and tomato ketchup). This worsens the plight of the local tomato farmers since processors continue to be uninterested in their produce for onward processing thereby placing further pressure on the local currency (Ghana Cedi) in the face of high import bill for finished tomato products. Tomato concentrates imported into the country have often had suspicious quality, an issue of great concern to the health of consumers.

- vii. Tomato product distributors and traders (members of Ghana Union of Traders' Association [GUTA]) will continue to be attracted to products (whether locally made or imported) to meeting the consumer demands available; a situation that is currently not favoring local tomato value chain.

Value chains work well when the end-products generating the revenues/incomes are large enough and consistent all year-round. Hence to make value chains work effectively it has to be demand – driven. The economics of this is that, imbedded in the price paid by a customer for a metric tonne of finished product (tomato mix, tomato puree and tomato ketchup) is:

- the profit margin of the retailer
- the profit margin of the wholesaler
- the profit margin of the distributor/transport owners
- the profit margin of the tomato processors
- the profit margin of the tomato farmer
- the profit margin of the tomato input suppliers and
- the sustainability of the projects of seed breeders and researchers

This entire chain is currently working poorly with too much cash leakages that fuels related value chains of the foreign countries at the expense of the local economy thereby aggravating unemployment levels, cedi depreciation and food insecurity.

Ideal situation for the local tomato value chain industry:

Two indicators need to be in place for the tomato value chain to thrive especially when the demand of tomato and tomato products is large and keeps growing:

- i. Stable tomato prices on the fresh tomato consuming market: Recent data shows that, farm gate prices of fresh tomatoes whether locally produced or imported ranges between GHS 2,000 per MT (GHS 270 per 135 kg box) and GHS 6,000 per MT (GHS

870 per 135 kg box) depending on the time of the year with sharp lower-limit and upper-limit outliers of GHS 40 per 135 kg box and GHS 1,400 per 135 kg box respectively. This has dire consequences for the cost of living for the general populace especially when tomato is a staple in every food consumed in Ghana and as such must stop. Thus, prices of fresh tomatoes need to be stabilized across the year with minimal volatility range.

- ii. Stable prices and supply adequacy for processors of fresh tomatoes: Free-on-Board (FOB) prices of tomato concentrates with brix levels 36-38 ranges between US\$780 and US\$1,100 per MT depending on the Minimum Order Quantities (MoQ) associated and the year of harvest of the fruits used in manufacturing the tomato concentrates. Coupled with sharp cedi depreciation, the input cost for finished tomato end-product (tomato mix, tomato ketchup and tomato puree) manufacturing in Ghana becomes expensive, unpredictable and internationally uncompetitive thereby leaving the manufacturer and other distribution channel players with a popular survival strategy option of hiking prices so high as to provide 'large enough' margins-of- safety against possible wild price movements.

1.3 The Identified Problem

To date, there has been very limited active industrial processors of fresh tomatoes in Ghana hence the entire figure is assumed to be consumed domestically (and not by industry/processors). Primary data gathered shows that, the market leader (with 25% market share) of tomato mix industry (which constitute approximately 90% of finished tomato products on the market) manufactures and sells 108,000 MT/annum from its installed capacity as at 2021. At the moment, with the exception of WEDDI Africa Tomato processing factory in Berekum, current operational tomato mix manufacturers do not use fresh tomatoes but rely only on imported concentrates for inward processing into the finished product (tomato mix).

With industry output of tomato mix at 432,000 MT¹ per year as at December 2021, a third $(1/3)^2$ of that net-weight will be required as tomato concentrates. Given multiple trials conducted at WEDDI Africa tomato Factory, to be able to achieve tomato concentrate brix of

36-38, a safe extraction rate of 1:10 is required (though 1:6 is ideal). Using a known machinery extraction rates and known tomato mix formulation, minimum fresh tomatoes required by industry to be self-sufficient could be estimated at approximately 1,584,000 MT/ annum. This estimate makes provision for a buffer of 10% to account for production losses. As such, for the Ghanaian tomato processing industry to be self-reliant, the country needs to produce at least 144,000 MT of tomato concentrate per annum translating into minimum fresh tomato target of 1,584,000 MT. Farmers across the country should produce at least 1,584,000 MT of industrial grade fresh tomatoes each year just to feed tomato processing industry.³

An equally important demand of fresh tomatoes aside processors (industry) is the household market that consumes fresh tomato as a staple vegetable. This market consumes at least 500,000 MT of fresh tomatoes annually. An additional market segment that consumes tomato puree, freshly chopped tomatoes and tomato ketchup is estimated to be the equivalent of 625,000 MT of fresh tomatoes as at 2021. This pushes the demand estimate to about 2.8 million MT of fresh tomatoes as at 2021 yet only about 371,300 MT of this is produced locally as at 2020 (MoFA-SRID, 2021). The biggest challenge to meeting this target over the years had been:

- i. Negligible investment into indigenous processing plants whose value chains starts from processing local fresh tomatoes
- ii. The absence of tomato varieties (industrial and fresh) well adapted to the local climate and soil qualities to guarantee the raw material parameters required by industry to operate competitively. Related to this is the deficit in good agronomic skills of the local producers and the persistent smallholder mentality.
- iii. A sharply disjointed tomato value-chain actors with observable divergent operational goals.
- iv. The absence of a national programmes and strategy targeting self-reliance in tomato production.
- v. The absence of a trusted umbrella body to manage annual tomato value-chain transactions in excess of US\$1 billion with almost double-digit annual growth projections.

¹ Market intelligence primary data gathered

² The assumption is that each tomato mix product has up to a third of its net weight constituted by tomato concentrates

³ Value chain actors workshop (2022), Developing a business case for Investments in Tomato value chain in Ghana, Fiesta Royale Hotel, Accra. October 26-28.

1.4 Goal and Objectives of Business Case

The goal of this business case is to develop a comprehensive, self-sustainable and institutionalised system that adequately solves all identified tomato value chain challenges in Ghana profitably. Thus, we aim to produce and process as much as we demand.

The specific objectives are as to:

- i. ensure national self-sufficiency of tomato production by the sixth year of full operations of this umbrella entity.
- ii. support the conduct of scientific research aimed at improving the quality of tomatoes seed varieties that makes the entire value chain internationally competitive.
- iii. undertake and promote the processing of fresh tomatoes with the aim of adding value for export and local consumption through Direct Investors (DIs) and/or strategic financing of critical value chain actors.
- iv. establish an Apex entity, equipped to raise adequate funding to address tomato value-chain bottlenecks in Ghana profitably.

1.5 Business Case Questions

Critical questions that guided this journey leading to the proposal for the creation of a self-sustaining tomato value chain are as follows:

- i. How large is the size of the tomato market?
- ii. What are the critical challenges within the tomato value-chain in Ghana?
- iii. How can all these identified challenges be integrated and solved sustainably?

1.6 Relevance of Business Case

Over the years, there have been several attempts (through programmes) at solving many identified problems with different tomato value chain actors. However, many of these programmes targeted singular value chain actors and at best a few value chain actors with mostly unsustainable funding. Past Governments in Ghana have developed great policies that have received limited funding and resourcing to achieve set targets.

As the second largest economy in West Africa, an investment into the tomato value chain can yield

immense gains in value creation, job creation, limitation of youth migration from Ghana to America and Europe and above all save hard earned foreign currency. The COVID-19 pandemic and even more so the recent Russian-Ukraine war have taught us a big lesson to be self-reliant and the time is now.

This case brings the minds of critical stakeholders in the tomato value-chain together at developing lasting solutions for Ghana. The case justifies the need to establish the Integrated Tomato Value Chain Company Limited (ITVCL).



PART TWO:

Profile of Participating Tomato Value Chain Actors



2.1 Introduction

This session presents the background of the various participating tomato value chain actors. The representatives of these entities are experts in their respective fields.

2.2 West Africa Center for Crop Improvement (WACCI), University of Ghana

The West Africa Centre for Crop Improvement (WACCI) was established as a partnership between the University of Ghana and Cornell University, USA with initial funding from the Alliance for a Green Revolution in Africa (AGRA) in 2007 to train Plant Breeders in a PhD programme at the University of Ghana. This partnership was driven by the earnest desire to train plant breeders who will develop improved varieties of the staple crops of Africa to contribute to food and nutrition security. Since its inception, WACCI has enrolled 160 PhD and 78 MPhil students from 20 Africa countries, namely Benin, Burkina Faso, Cameroon, Democratic Republic of Congo, Ethiopia, Gambia, Ghana, Kenya, Liberia, Malawi, Mali, Niger, Nigeria, Senegal, Sierra Leone, South Sudan, Tanzania, Togo, Uganda, and Zimbabwe. One hundred and five PhDs and 30 MPhils have completed their studies and are working in National Agricultural Research Systems in their home countries.

Over the years, WACCI has evolved into a leading Centre of Excellence in postgraduate education in Agriculture and a champion for food and nutrition security in sub-Saharan Africa. In 2015, WACCI was selected as one of the World Bank Africa Centre of Excellence (ACE) through an open, rigorous and merit-based assessment of proposals from institutions across the West and Central Africa sub region. Under the ACE project which spanned a period of four years, WACCI received US\$ 8 million after meeting key disbursement linked indicators. The Centre was adjudged one of the top institutions in the implementation of the project and was selected on merit to receive US\$ 5.5 million in a phase 2 of the ACE for Development Impact project over a five-year period, 2018 – 2023. To date, the Centre has leveraged on its resources through strategic partnerships to develop into an agricultural innovation and entrepreneurship institution. This has brought about US\$ 40 million from several partners over the past 15 years. WACCI continues to explore strategic partnerships to become a research-intensive institution to impact the transformation of agriculture through the

development of resilient, nutritious, productive, and market-driven varieties of staple crops to meet national demand with possible spill-over to the West and Central Africa sub-region.

2.3 Ministry of Food and Agriculture (MoFA)

The Ministry of Food and Agriculture (MoFA) is the lead agency and focal point of the Government of Ghana, responsible for developing and executing policies and strategies for the agriculture sector within the context of a coordinated national socio-economic growth and development agenda. By means of a sector-wide approach, the Ministry's plans and programmes are developed, coordinated and implemented through policy and strategy frameworks. In this regard, MoFA facilitated the preparation of the Food and Agriculture Sector Development Policy (FASDEP II) and the Medium-Term Agriculture Sector Investment Plan (METASIP 2010-15).

2.4 Council for Scientific and Industrial Research – Crop Research Institute (CSIR-CRI)

The Council for Scientific and Industrial Research (CSIR) is the foremost national science and technology institution in Ghana. It is mandated to carry out scientific and technological research for national development. The CSIR is mandated to pursue, among others, the implementation of government policies on scientific research and development, coordinate research and development (R&D) activities in the CSIR and other science and technology (S&T) institutions nationwide and assist the government in the formulation of S&T policies for national development. It was established by NLC Decree 293 of October 10, 1968, amended by NLCD 329 of 1969, and re-established in its present form by CSIR ACT 521 on November 26, 1996. The genesis of the council however, dates back to the erstwhile National Research Council (NRC), which was established by the government in August 1958 to organize and coordinate scientific research in Ghana. In 1963, the NRC merged with the former Ghana Academy of Sciences, a statutory learned society. Following a review in 1966, the academy was reconstituted into, essentially, its original component bodies, namely a national research organization predesignated the CSIR and a learned Society, designated the Ghana Academy of Arts and Sciences. The distinctive features of the

1996 Act are the emphasis accorded private sector concerns, and the introduction of market principles into the council's operations through the commercialization of research. In this connection, the council is expected to generate part of its income through the sale of its products and services, and to institute a system of contract research.

The CSIR-Crops Research Institute (CRI), an identified value chain actor, is the oldest and largest of the six crop-based institutes of the CSIR. It covers the southern regions of Ghana from Ashanti region down to the coast with tomato as one of its mandate crops. Its counterpart in the Northern Savanna agro-ecologies is the CSIR-Savanna Agricultural Research Institute (SARI) whose mandate crops also include tomatoes.

2.5 Ghana Incentive-Based Risk-Sharing System for Agricultural Lending (GIRSAL)

GIRSAL is a non-banking financial institution established to de-risk agricultural financing and stimulate increased lending to the agricultural sector, by financial institutions in Ghana. GIRSAL provides credit risk guarantees to financial institutions to increase lending to the agricultural sector in Ghana. It also provides technical support to improve their knowledge and understanding of the agricultural sector and to strengthen their capacity to access, structure and manage agribusiness lending. GIRSAL is a limited liability company wholly owned by the Government of Ghana through the Ministry of Finance and is capitalized with seed funding from the Bank of Ghana and the African Development Bank (AfDB).

2.6 National Seed Traders Association of Ghana (NASTAG)

The National Seed Trade Association of Ghana (NASTAG) is an amalgamation of all the value chain actors in the seed industry which culminated from a resolution passed by stakeholders in a meeting sponsored by the USAID - Agriculture Policy Support Project (USAID/APSP) in November 2015. It is a not-for-profit membership-based association limited by guarantee, incorporated in February 2016 and officially launched in August 2017. NASTAG is dedicated to supporting the competitiveness of Ghana's seed value chain through business and technical capacity building of its members, promotion of effective collaboration among and between actors, advocacy, regulation and standardization, and provision

of general seed information. It has positioned itself to supporting the industry players to develop their niche to the fullest potential for individual and collective benefits; ultimately contributing to enhancing agricultural production that will improve farmers' livelihoods and overall agriculture in Ghana.

2.7 Ghana National Tomato Traders and Transporters Association (GNTTTA)

This is an association of fresh tomato retailers with their market queens (distributors) and their corresponding transporters within the country. Their activities principally boarders on monitoring the activities of the members to ensure that, the demand-supply dynamics corresponds well with their members' activities in a more sustainable manner. The association was established in 2007 and as at 2022 had approximately 3,500 wholesale fresh tomato buyers and approximately 500 transporters.

2.8 Eventzpro Consult Limited

Eventzpro is a consulting firm that led the establishment of the WEDDI Africa Tomato Processing Factory in Berekum. The consulting firm represented by its Chief Executive Officer (CEO), Mr. Kwame Fosu-Boateng lead the writing of this business case.

WEDDI Africa Limited Tomato Processing factory in Berekum is a wholly owned Ghanaian factory established in the heart of tomato production in Ghana. The factory was commissioned in 2021 with installed fresh tomato throughput processing capacity up to 120 MT/day and installed tomato concentrate throughput of 120 MT/day. The company has over 2,300 out-growers and opportunities for in-grower farming activities.

2.9 Agromite Limited

Agromite Limited is an agribusiness solutions firm engaged in out-grower schemes, commodity trading, provision of mechanized services to farmers, agricultural machinery and farm equipment sales and service. Its goal is to transform agriculture from subsistence farming to sustained profits enterprises using the Value Chain Management approach. The Agromite Limited Value Chain approach is comprehensive through the provision of appropriate technologies, providing reliable mechanized services to enable farmers to access these technologies and linking production to well-structured markets and facilitating financing for the production, where needed. These approaches are aimed at reducing the risk associated with production and improving markets for the produce.

2.10 Calli Ghana Limited

Callighana Company Limited is a subsidiary of the global group UPL. Since 2003, the company has been involved in the importation and distribution of agrochemical products, spraying and micro drip irrigation equipment, seeds as well as providing its valued partners with technical support and training on safe handling and use of agrochemicals. The skilled and experienced team of Calli Ghana is continuously working towards the satisfaction of its partners. Calli Ghana aims to reach out to a large majority of producers, notably small and large-scale farmers whose access to quality and accredited inputs has been a challenge over the years. UPL is one of the world leaders in the fields of agrochemicals, BioSolutions, crop protection and the development of climate-smart technologies. Following the acquisition of Arysta Life Science in 2018, UPL has secured its place as a leader in the global food systems and is positioned as one of the top five (5) agricultural solutions companies in the world.

During its 50 years of history, the UPL group has developed and expanded through a deeper commitment to innovation and technology. Many of these technologies were developed in India and shared with producers in 130 countries around the world. Today, UPL is focused on emerging as a leading global provider of comprehensive crop solutions designed to secure the long-term global food supply, improve agricultural sustainability, and improve the economic prosperity and resilience of farmers. UPL operates on the African continent through the following subsidiaries Callivoire (Côte d'Ivoire), Callighana (Ghana), MPC (Mali), Spia (Senegal), AgriFocus (Mozambique), and UPL Nigeria, Togo and Benin.





PART THREE:

Case Analysis of Tomato Value Chain in Ghana

3.1 Introduction

The development of this business case was made possible by the gathering of expert knowledge from each tomato value chain actor in Ghana over a three-day period. During the three-day brainstorming session, each value-chain actor made detailed presentation on their respective operations and bottlenecks with commensurate recommendations presented towards addressing their respective challenges.

The next session of the meeting focused attention of how to integrate solutions prescribed for addressing each value-chain actor's operations. A framework was drafted based on which, each participant made direct inputs until there was full consensus built on an integrated solution to address identified bottlenecks. The integrated solution requires the establishment of an Integrated Tomato Value Chain Company.

3.2 Data gathering method

The study relied on both primary and secondary data collected from fourteen (14) value chain actors that represented all critical actors in the tomato value chain in Ghana. Hence, this report is confident that, the business case proposed has expert knowledge covering all critical tomato value chain actors in the country.

Main questions that sought to be answered are:

- i. How large is the size of the tomato market?
- ii. What are the critical challenges within the tomato value chain in Ghana?
- iii. How can all these identified challenges be integrated and solved sustainably?

3.3 Data analysis method

The market demand size was estimated quantitatively using primary data derived from processed tomato products supplied on the Ghanaian market as at 2021 plus fresh tomatoes produced and supplied by the Ghana National Traders and Transporters Association's records. Growth rate for forecasting was premised on; known ongoing expansions by tomato mix producers in Ghana (in estimating tomato concentrate required to be self-reliant as a country); records of fresh tomatoes transported by Ghana National Tomato Traders and Transporters Association (GNTTTA) and the records of locally produced tomatoes from Ministry of Food and Agriculture (MoFA) and Ministry of Trade and Industry (MoTI).



Table 1: Market Size Estimation of The Tomato Value Chain in Ghana

	Years				
	2021	2022	2023	2024	2025
Tomato Mix (A)					
Current estimation of tomato mix produced (MT)	432,000	475,200	522,720	574,992	632,491
Equivalent tomato concentrates required (factor of 1/3) (MT)	144,000	158,400	174,240	191,664	210,830
Equivalent fresh tomatoes required (multiple of 10) (MT)	1,440,000	1,584,000	1,742,400	1,916,640	2,108,304
Additional buffer (10% of Equivalent fresh tomatoes required) MT	<u>144,000</u>	<u>158,400</u>	<u>174,240</u>	<u>191,664</u>	<u>210,830</u>
Total tomato mix (MT)	1,584,000	1,742,400	1,916,640	2,108,304	2,319,134
Fresh tomato consuming market (B) (MT)***	<u>500,000</u>	<u>550,000</u>	<u>550,000</u>	<u>550,000</u>	<u>550,000</u>
Sub-total (A+B) (MT)	2,084,000	2,292,400	2,466,640	2,658,304	2,869,134
Other tomato products directly imported into the country					
Foreign manufactured tomato mix, Ketchup, freshly chopped tomatoes (estimated at 30% of subtotal) (MT)	<u>625,200</u>	<u>656,460</u>	<u>689,283</u>	<u>723,747</u>	<u>759,935</u>
TOTAL ANNUAL FRESH TOMATO DEMAND (MT)	2,709,200	2,948,860	3,155,923	3,382,051	3,629,069
Land size (ha) to be cultivated if varieties give 50 MT/ha (Minimum yield for competitive pricing of fresh tomato for all market and product segments)	54,184	58,977	63,118	67,641	72,581
Price (US\$) per 100 g cultivated per ha	107.5	107.5	107.5	107.5	107.5
Estimated market size for seeds (US\$)	5,824,780	6,340,049	6,785,234	7,271,410	7,802,498
Price (US\$) per MT for fresh tomato market ideal to ensure stability	238	243	248	253	258
Size of fresh tomato consuming market (US\$)*	119,040,000	133,562,880	136,234,138	138,958,820	141,737,997
Price per MT feasible at factories (US\$) at annual growth rate of 2%	198.4	202.4	206.4	210.5	214.8
Size of industrial grade fresh tomato market (US\$)**	438,305,280	485,452,500	537,902,534	596,270,435	661,244,029
ESTIMATED MARKET SIZE OF THE FRESH TOMATO MARKET (US\$)***	537,505,280	596,754,900	651,430,982	712,069,452	779,359,026
Minimum market price (US\$) per MT of tomato mix products on the local market (using distributor price averages per FCL) at annual growth rate of 2%	1,310	1,335.71	1,362.43	1,389.68	1,417.47
ESTIMATED MARKET SIZE OF TOMATO MIX MARKET (\$)	565,714,286	634,731,429	712,168,663	799,053,240	896,537,735
Foreign manufactured tomato mix, Ketchup, freshly chopped tomatoes (estimated at 30% of tomato mix market) with average annual growth at 10%	129,600	142,560	156,816	172,498	189,747
Minimum market price per MT of tomato ketchup and puree on the local market (using distributor price averages per FCL) at annual growth rate of 2%	1,810	1,846	1,883	1,921	1,959
ESTIMATED MARKET SIZE OF OTHER TOMATO FINISHED PRODUCTS MARKET (US\$)	234,576,000	263,194,272	295,303,973	331,331,058	371,753,447
TOTAL MARKET SIZE OF THE TOMATO INDUSTRY (US\$)	919,330,286	1,031,488,581	1,143,706,774	1,269,343,118	1,410,029,179

NOTES:

* This represents how much is required to be produced locally to avert further import of fresh tomatoes from other countries in Ghana

** This represents how much is required to be produced locally to feed tomato a thriving tomato processing industry at a level whereby importation of tomato concentrates and finished products from other countries into Ghana becomes unattractive.

***This reflects the revenues that will go to local farmers for producing enough tomatoes to feed the fresh consuming market and tomato processing to achieve self-reliance

Source: Value chain actors workshop¹

¹ Value chain actors workshop (2022), Developing a business case for Investments in Tomato value chain in Ghana, Fiesta Royale Hotel, Accra. October 26-28.

3.4 Identified bottlenecks of the tomato value chain actors

A thematic content analysis was conducted on points during presentations made by each value-chain actor and a list of bottlenecks were identified. These received full validation from all participants gathered. The bottlenecks include:

- Absence of an integrated national programme and strategy on tomato breeding and research with commensurate funding.
- Inadequate number of indigenous breeders.
- Limited number of certified varieties that suite the local soil and weather while guaranteeing minimum yields of 50 MT/ha and possess other qualities suitable for processors and fresh consuming market.
- Poor seed supply regime.
- Limited regulation and supply of agro-chemicals specified for tomatoes.

- Very poor farm management practices by farmers.
- Limited funding for irrigation and mechanization of tomato farms.
- Unregulated farmer activities due to the absence of recognized and supervised farmer-based organizations that farmers are allegiant to.
- Poorly resourced and supported tomato transportation and trading system.
- No institution to finance strategic agricultural development in Ghana.
- Low levels of skills and expertise along the value chain.

All the above challenges culminate into a staggering imbalance between demand and supply of fresh tomatoes and tomato product. This could have been led by local production to offset imports figures estimated around US\$1 billion annually.

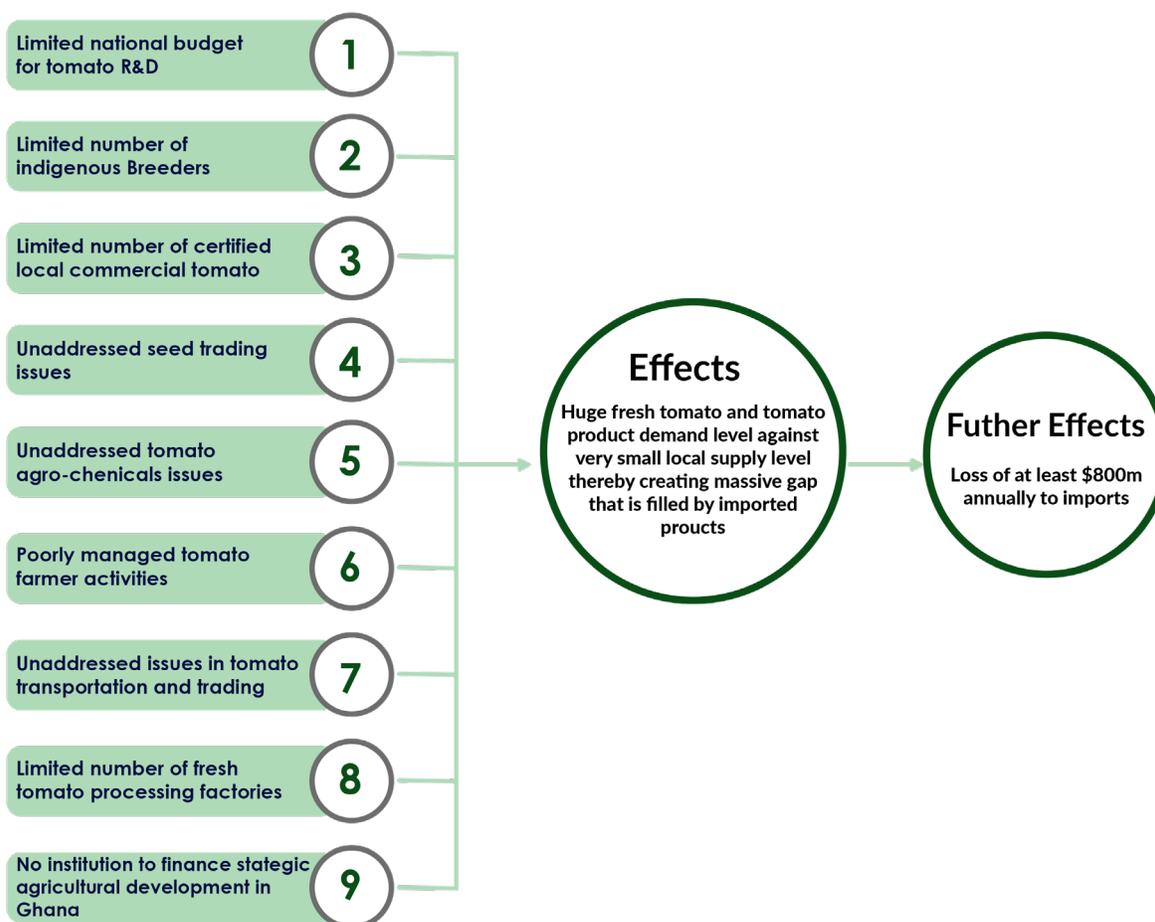


Figure 3: Root-Cause Flowchart of the Possible Forex Losses in the Tomato Value Chain
Source: Value chain actors workshop¹

¹ Value chain actors workshop (2022), Developing a business case for Investments in Tomato value chain in Ghana, Fiesta Royale Hotel, Accra. October 26-28.



PART FOUR:

Integrated Tomato Value Chain Company Limited (ITVCL)

4.1 Introduction

This section presents an over-arching design framework that should guide the establishment of the apex body. Fine details on the entity's specific strategies and operational tactics will be later discussed and captured on other corporate documents to be developed.

4.2 Vision Statement

To achieve and sustain national self-sufficiency for tomatoes.

4.3 Mission Statement

We exist to promote the effective and efficient continuous production, processing and marketing of quality tomato and tomato products in Ghana. We are therefore positioned to achieve this through the integration of all value-chain activities harmoniously while attracting adequate financing and technical support from local and foreign partners.

4.4 Long term Objectives

The following objectives are to be achieved within the next five years:

- Guide and implement value chain programmes that ensure minimum annual fresh tomato targets of 2.8 million MT and reviewed annually.
- Guide and implement value chain programmes to ensure the effective functioning of new and dormant fresh tomato processing factories at full capacity.
- Design and implement integrated strategies to secure adequate production of fresh tomatoes at all times to meet market demand
- Drive minimum investments of US\$1 billion annually to the tomato industry in Ghana.
- Provide a one-stop-shop to address all tomato value-chain issues in Ghana.

4.5 Form or Corporate Ownership and Sources of Funding

Integrated Tomato Value Chain Company (IVTCL) shall be registered as a Company Limited by Shares with opportunities for every value chain actor and other stakeholder to buy shares of this entity. The establishment of this company will require undertaking

pre-establishment activities and grooming stage activities for the entity. The pre-establishment activities have to be adequately funded through GRANTS while the grooming and growth activities have to be funded through EQUITY and DEBT. Implementation of this documents therefore starts with seeking donor funding to cater for pre-establishment activities. Principal targets are Syngenta Foundation for Sustainable Agriculture (SFSA), IFAD, IFDC, USAID, GIZ, DANIDA, JICA and Ghana CARES among others.



4.6 Corporate Governance structure of ITVCL

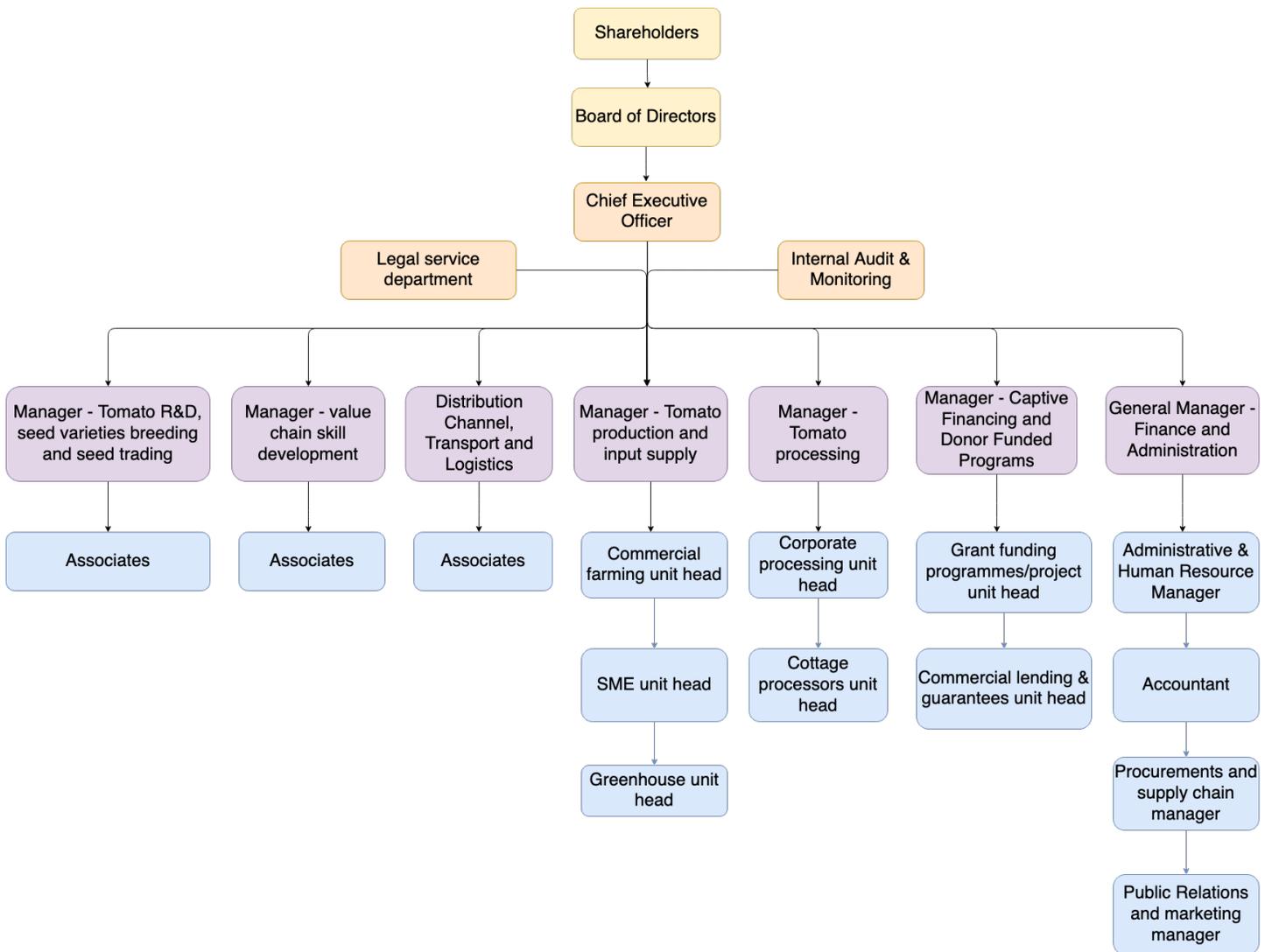


Figure 4: Proposed Organogram for the ITVCL

4.7 Revenue Sources of the Integrated Tomato Value-Chain Company Limited (ITVCL)

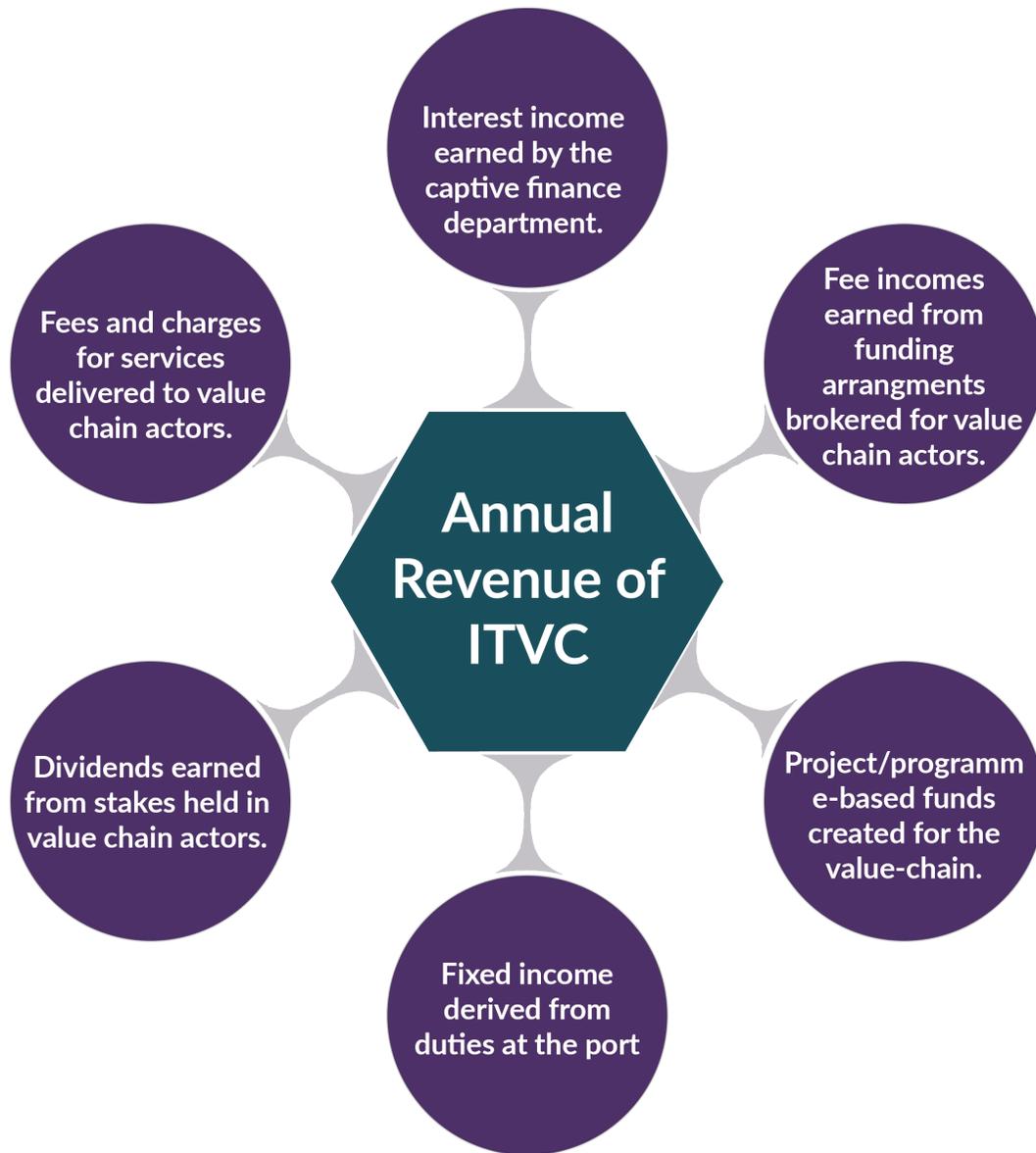


Figure 5: Proposed Sources of Revenue for the ITVCL

4.8 Measurable Output target for each Tomato Value Chain actor

Deliberations among experts gathered facilitated the sharing of very essential primary data that revealed critical seed qualities that would secure sustainable processing. Using that as premise, output targets

were developed for each value chain actor with their corresponding resource requirement that would serve as guide to the implementing body in developing programmes and strategies that would ensure the effective and efficient working of ITVCL (Table 2).

Table 2: Measurable Output Target for Each Value Chain Actors

Value Chain Actors		Output Target	Resource Requirements
1.	Seed Variety developers (industrial varieties for processing)	<ol style="list-style-type: none"> 1. Brix > 5.5. 2. PH: 4.27-4.40 3. Skin Color (a/b): > 0.85 4. Puree Color (a/b): >0.82 5. Titrable Acidity (%): 0.25-0.35 6. Bostwick (cm/30s): >16.5 7. Total solids (%) >6.0 8. Minimum yield per hectare: > 50 MT/ha 9. Farm gate price per MT < US\$198.4 	Grant Funding (budget to be produced)
2.	Seed Production/ multiplication Companies	Over 135,000ha of lands cultivated each year across the country	Adequate CAPEX and Working capital funding to companies with proven track records.
3.	Agro-input suppliers	Timely supply of implements and consumables	Adequate Working capital funding to companies with proven track records.
4.	Farmers	Cultivate at an operational cost not exceeding GHS 24,700 per hectare and be willing to sell to industry at US\$0.1984 per kilo and willingness to honor contracts.	Adequate CAPEX and Working capital funding to companies with proven track records.
5.	Monitoring and Evaluation Companies	Mediate between financiers and actors to monitor attainment of KPIs and report to stakeholder to facilitate Monitoring, Evaluation and Learning (MEL) goals	Adequate funding of logistics
6.	Transporters	Timely transportation of produce from farm gates to market queens and factories.	Adequate funding for haulage trucks and administrative support
7.	Tomato processing companies (industry) & Market queens for fresh tomatoes	Ready and willing to sign offtaker agreements with farmers and honour them,	Adequate funding for CAPEX and OPEX with guaranteed fresh tomato supply
8.	Finished products distribution Companies	Commitment to prioritize locally processed tomato products	Good margins
9.	Final Consumers (retail market)	Loyalty to made-in-Ghana products	Product quality at good price
10.	Policy Makers	Implement protectionist policies	Policy direction

Source: Value chain actors workshop¹

¹ Value chain actors workshop (2022), Developing a business case for Investments in Tomato value chain in Ghana, Fiesta Royale Hotel, Accra. October 26-28.

4.9 The Management Structure

The institution of a management team should be shortly followed by the development of a strategic plan to operationalize this broad framework designed for the ITVCL. Relevant management manuals and standard

operating manual should be developed to guide the functionality of all players and actors in the tomato value chain.



PART FIVE:

Implementation Plan and Budget Estimate

5.1 Introduction

The session contains the implementation plan and budget estimate. The implementation plan is required to be spearheaded by a team of consultants that should be instituted to facilitate the full execution of the plan (table 3).

Table 3: Implementation Plan for the Establishment of the Integrated Tomato Value Chain Company Limited (ITVCL)

Activity	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Development of business case	■											
2. Acquire grant funding for pre-establishment activities	■	■	■									
3. Constitution and equipping of a consulting team to birth ITVCL			■									
4. Promote the organization of value chain actors and facilitate their input into the entire plan.			■	■								
5. Redevelop business plan/prospectus targeting specific funding partners				■	■							
6. Complete the raising of seed capital for ITVCL						■	■					
7. Set up the BoD and the office infrastructure								■				
8. Recruit management team and staff									■	■		
9. Launch ITVCL and its strategic plan											■	
10. Commence full operations of ITVCL											■	■

5.2 Budget estimate

There are two (2) classes of budget activities that needs to be funded in order to launch and operate ITVCL. These are the pre-establishment expenditure items and the ITVCL seed capital with its associated financial model. These will be detailed by the team of consultants that will be later constituted.

References

1. Ochieng C. & T. Sharman. 2005. Trade Traps: Why EU-ACP Economic Partnership Agreements Pose a Threat to Africa's Development, Actionaid International, Online at https://eprints.lancs.ac.uk/id/eprint/34763/1/Trade_traps.pdf, Accessed on 28th Oct. 2022
2. Robinson E.J.Z. & S. Kolavalli. 2010. The case of tomato in Ghana. GSSP Working Papers nos. 19 to 23. Accra: International Food Policy Research Institute.
3. van Asselt J., I. Masias & S. Kolavalli. 2018. Competitiveness of the Ghanaian vegetable sector: Findings from a farmer survey. GSSP Working Paper 47. Accra: International Food Policy Research Institute.

Appendices

Developing a Business Case for Investments in Tomato Value Chain in Ghana, Fiesta Royale Hotel, Accra, October 26-28, 2022

Agenda

Day one, Wednesday, October 26, 2022

Activity	Time
Introductions – <i>Dr. Agyemang Danquah, Coordinator for Academic Programmes, WACCI</i>	09:00 – 09:10
Welcome address – <i>Prof. Eric Y. Danquah, Director, WACCI & 2022 Africa Food Prize Laureate</i>	09:10 – 09:30
Purpose of workshop – <i>Prof. Pangirayi Tongoona, Associate Director, Breeding Programmes, WACCI</i>	09:30 – 09:45
Group Photograph	09:45 – 10:00
Cocoa break	10:00 – 10:30
Overview of the tomato industry in Ghana – <i>Ms. Esther Agyekum, Assistant Director & Head of Horticulture Department, Ministry of Food and Agriculture [MoFA]</i>	10:30 – 11:00
The fresh tomato industry in Ghana – <i>Ms. Vivian Smith, PRO, Ghana National Tomato Traders and Transporters Association [GNTTTA]</i>	11:00 – 11:30
The tomato seed value chain in Ghana – <i>Mr. Eric Quaye, Director, Plant Protection and Regulatory Services Directorate [PPRSD], MoFA</i>	11:30 – 12:00
Tomato research and breeding in Ghana – <i>Dr. Michael Osei, Senior Research Scientist, Crops Research Institute [CSIR-CRI]</i>	12:00 – 12:30
The tomato paste industry in Ghana – <i>Mr. Kwame Fosu-Boateng, Consultant, WEDDI Tomato Factory</i>	12:30 – 01:00
Lunch break	01:00 – 02:30
Funding/insurance for the agricultural value chain in Ghana – <i>Mr. Samuel Yeboah, Deputy Chief Operating Officer (Agribusiness), Ghana Incentive-Based Risk-Sharing System for Agricultural Lending Project [GIRSAL]</i>	02:30 – 03:00
Challenges in the tomato value chain in Ghana – <i>Mr. Adu-Gyamfi, President, National Seed Traders Association of Ghana [NASTAG]</i>	03:00 – 03:30
Mapping the actors in the Tomato Value Chain in Ghana – <i>Dr. Henry Anim-Somuah, Director of Operations, Agromite Limited</i>	03:30 – 04:00
Reflections on presentations [The tomato industry in Ghana] a. <i>Mr. Eric Tuffuor, Chairman, Ghana National Tomato Traders and Transporters Association [GNTTTA]</i> b. <i>Mr. Adu-Gyamfi, President, National Seed Traders Association of Ghana [NASTAG]</i> c. <i>Dr. Henry Anim-Somuah, Director of Operations, Agromite Limited</i> d. <i>Dr. Solomon Gyan, Director, Crop Services Directorate, MoFA</i> e. <i>Prof. Walter Alhassan, Director, Biotechnology and Stewardship for Sustainable Agriculture in West Africa (BSSA)</i> f. <i>Prof. Pangirayi Tongoona, Associate Director, Breeding Programmes, WACCI</i>	04:00 – 05:00
Wrap up & closing	05:00 – 05:10

Day two, Thursday, October 27, 2022

Activity	Time
Recap of day one activities – Ms. Enyonam Damesi, Communications Manager, WACCI	09:00 – 09:30
Proposal for the establishment of a Ghana Integrated Tomato Value Chain Company – Mr. Kwame Fosu-Boateng, Consultant, WEDDI Tomato Factory	09:30 – 10:00
<i>Cocoa break</i>	10:00 – 10:30
Reflections/discussions on the proposal	10:30 – 11:30
Presentation on structure of a business case document	11:30 – 12:00
Writing of tomato business case document	12:00 – 01:00
<i>Lunch</i>	01:00 – 02:30
Writing of tomato business case document	02:30 – 04:30
Wrap up & closing	04:30 – 05:00

Day three, Friday, October 28, 2022

Activity	Time
Recap of day two activities – Ms. Enyonam Damesi, Communications Manager, WACCI	09:00 – 09:30
Writing of tomato business case document	09:30 – 10:00
<i>Cocoa break</i>	10:00 – 10:30
Writing of tomato business case document	10:30 – 01:00
<i>Lunch</i>	01:00 – 02:30
Writing of tomato business case document	02:30 – 03:30
Finalizing of the tomato business case document	03:30 – 04:00
Implementation plan and next steps	04:00 – 04:30
Closing address – Prof. Eric Y. Danquah, Director, WACCI & 2022 Africa Food Prize Laureate	04:30 – 05:00

Welcome address

Eric Yirenkyi Danquah, PhD (Cantab)
Professor & Founding Director, WACCI



A very good morning to all of you.

It gives me great pleasure to address such a diverse team of knowledgeable and experienced professionals from government, industry, farmers associations and cooperatives. I am a firm believer in bringing together great minds and I was delighted to see the participants list last night when

I was looking through programme for this workshop. I commend my colleagues for putting together such a great agenda I believe will keep you busy over three days. I have seized every public-speaking opportunity to echo the importance of investing in agriculture as a sure way to turn around Africa and more specifically, Ghana's fortunes. It is our only way to make significant strides in the country in the short and medium term.

The looming crises today would not have been here with us if we had been serious about achieving food and nutrition security when it was obvious at the end of 2015 that we did not do well in the food production sector.

In tomato, the situation has been troubling for a very long time. We have recently learnt that Ghana spends an estimated \$400 million annually on importing fresh tomato from Burkina Faso. That is a huge sum to expatriate for a low income country with such vast arable land. It is ridiculous that as recently as 2020, Ghana did not have a single tomato scientist trained at the PhD level working in the national agricultural research systems.

It took us at the West Africa Centre for Crop Improvement to innovate and look for funding to train tomato geneticists and breeder. The pay-offs from our leadership in the training of plant breeders at the PhD level in Africa for Africa is there for all to see and we hope that the government would prioritize investments in science technology and innovation for agricultural development. Let me add that Climate Change and Conflicts will continue to challenge us and Covid-19 has taught us that we cannot sit and wait for planes to land in Accra before we deliver seeds to farmers at the beginning of plantings seasons. What we need is urgent action for self-reliance in food production.

What we are here to do is proffer action-backed solutions to ensure we are cutting back on imports to empower local stakeholders.

We are here to make a compelling case for investment in the tomato value chain, an industry that is rapidly growing and could be a game-changing opportunity for improved livelihoods, jobs for the youth and economic prosperity. I have no doubt about the quality of people we have gathered here today, and that gives me confidence in the final output. I know the next few days will be challenging, but what we have set out to do is historic and that should encourage us to commit to the cause.

I would like to acknowledge the Government of Ghana's efforts to support the agriculture sector through the Ghana Cares Obaatanpa initiative. Government's effort to invest into seed systems to drive the value chain is commendable but the investments must be at levels that allow us to use the best of sciences to efficiently and effectively develop resilient, nutritious and productive varieties to farmers in real time.

We cannot wait for is the investments that we so urgently need to show that we are a truly innovative institution. I would like to thank the stakeholders who have made this workshop possible: the University of Queensland, Syngenta Foundation for Sustainable Agriculture and Crawford Fund. I welcome you all to this important workshop to develop a business case for investments in a tomato value chain in Ghana.

Thank you.



WEST AFRICA CENTRE FOR CROP IMPROVEMENT
UNIVERSITY OF GHANA, LEGON

WORKSHOP

Developing a Business Case for Investments in Tomato Value Chain in Ghana

START = 09:02

October 26 - 28, 2022
Fiesta Royale Hotel, Accra

MIS VANESSA





Prof. Eric Yirenkyi Danquah



Prof. Pangirayi Tongoona



Ms. Esther Agyekum



Mr. Eric Tuffour



Ms. Ruby Daikie Agorvor



Mr. Kwabena Adu-Gyamfi



Dr. Agyemang Danquah



Mr. Emmanuel Sarkodie



Dr. Michael Osei



Mr. Kwasi Wih



Mr. Samuel Yeboah



Mr. Kwame Fosu-Boateng



Prof. Walter Alhassan



Ms. Vivian Smith



Dr. Henry Anim-Somuah



Ms. Enyonam Damesi



