CHILLIMARKET DIAGNOSTICS

DFID Market Development (MADE) in Northern Ghana Programme

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Contents

SECTION 1. INTRODUCTION

Chilli is a highly profitable crop cultivated by over 198,949[1] smallholders in Northern Ghana. Chilli farmers claim incomes from the crop constitute 60-70% of their farm income. Improving yields and switching to cultivars that offer higher profits would substantially increase incomes. At present,chilli is largely (about 70%) produced under rain-fed conditions. However, with irrigation, it is possible to grow the crop year round, which would transform farmer's incomes.

Chillitends to require two to four times more labour than cereal cropsand this provides income earning opportunities forwomen and youth. The drying, trading and processing of chillies provides further opportunity for enhancing incomes, especially for women. The combination of good climatic conditions, mixed farming (crop-livestock) practices and cheaper and more productive labour, gives Northern Ghana competitive advantages over southern Ghana.

The demand for chillies is growing strongly in Ghana. It is used in fresh or dry form in almost all Ghanaian dishes. Ghana also exports a significant volume of chillies to the EU. However, exports currently originate almost exclusively from southern Ghana.

Thepotential to provide good livelihoods for a large number of farmers, providing opportunities for the poor to sell labour and boosting women's incomes from processing and trading chillies makes chillies a pro-poor crop for the North. The region's potential competitive advantage and the strength of demand from domestic and export markets should help ensure that potential gains in incomes will be sustained in future.

The table below provides a summary diagnostic of the market for chillies. A narrative that addresses the key issues raised in the diagnostic follows.

[1] Fifth Series of Ghana Living Standard Survey (GLSS 5, 2008)

Table 1.Chilli Market System Analysis

Mapping the poor and other actors	Market Growth and Segmentation Analysis	Value Chain Analysis	Analysis of support functions	Analysis of policies and institutions	Identification of Systemic Constraints
General • Chilli is grown by more than 198,000 households in theSavannah belt making it the fifth largest crop • With the decline of tomatoes, it is now the most profitable vegetable crop. • The North produces 2/3 of Ghana's production and has a substantial competitive advantage over the south. • Growing under irrigation holds great potential for increasing incomes. The Poor • In the North, Chilliis produced mostly by male, smallholder farmers • Chilli is very labour intensive offering opportunities for the poor, especially women, to augment their incomes • Women dominate processing and trading and these activities are very valuable sources of household income	Market Growth • Fast growth domestic market (8% p.a.) driven by the establishment of hospitality industries, increased incomes and consumer preferences as integral to Ghanaian cuisine. • Demand is greater than supply causing prices to double between 2007-2010. • Exports directed at the EU marketare growing even fasterreflected in 60% increase in exports from 2005-2007.Legon 18 (lady finger) and Bird's Eye varieties have great export potential as Ghana is low cost producer Segmentation • Three main market segments: i) domestic fresh; ii) domestic dried; and iii) export fresh. Exports of processed Shito are emerging. • Domestic dried segment leads into processed products including powder	General • Northern production system is low input/low output with poor agricultural practices • Productivity in Ghana (8mt/ha) is far below potential (32.3mt/ha) • Profitability is relatively low for local varieties but increases dramatically when improved varieties are grown using modern inputs. • Majority of crop is grown in rainy season. Dry season cultivation using irrigation will increase productivity and incomes but crop is heavy user of nutrients so investment in soil fertility is essential. Domestic Fresh • Fresh domestic market is buyer driven with farmers receiving a small proportion of final prices • There are huge losses during transportation to the south. Domestic Dried • Value addition is greatest	Research • SARI is developing new varieties and better drying technology but poor partnerships with relevant stakeholders results in failure to disseminate &commercialise. Knowledge &information • Public extension services are inadequate, with low ratio of agents to farmers. • Private input dealers are unable to convince farmers to use high yielding varieties. • Buyers, exporters do not transfer knowledge effectively • Information on what the market is willing to pay for does not reach farmers quickly. Irrigation • North uses only a fraction of irrigation potential. Many existing schemes in poor condition Finance • Lack of availability of finance to farmers is major constraint for capital	GOG & SADA • Chilli is not given major attention by policy makers and agricultural institutions. • Lack of government investment in public institutions for agriculture (research, extension, irrigation) is acute for chilli as not considered priority crop. • Fertiliser subsidy policy could be better targeted which would make more fertiliser available for high value crops such as chilli. • Research and extension institutions are ineffective in commercialising new technologies, as they lack connections with the private sector. Donors • Chilli is part of the vegetables value chain yet to be developed by NRGP. • GiZ was active in the North, but its interventions are now limited to 300 farmers.	General • Under supply of public goods- research, extension, irrigation. • Information failures, reinforced by poor access to markets, result in farmers remaining unconvinced of the benefits of adopting new varieties, using modern inputs. • Market failures in access to finance limit ability of farmers, traders and processors in the north to take advantage of growing opportunities. • Coordination failures result in bottlenecks across the value chain that make the system slow to respond to market trends • Market failures in financial markets. • The poor investment climate in the North reduces the incentive for Southern based exporters and major agribusiness firms to invest to

Mapping the poor and other actors	Market Growth and Segmentation Analysis	Value Chain Analysis	Analysis of support functions	Analysis of policies and institutions	Identification of Systemic Constraints
Other Actors • Artisanal processing and trading in the North is fragmented with many women involved. • The supply of fresh chilli to the south involves merchants in the south working with farmers and using women traders in the North to buy and arrange for shipment • The four major market centres for chilli in the south (Kumasi, Techiman, Takoradi and Accra) have open air markets where fresh and dry chillies are sold by large numbers of women. • Organized processing in the North is limited to two SMEs. There are large numbers of SME processors in Kumasi and Accra • Exportsdominated by two associations who are yet to establish supply chains in the North.	and Shito. • Trend towards more processed products due to convenience • Fresh chillies are sold mainly loose in the domestic market but some packaging is emerging to serve supermarkets and hospitality industries • Export chillies are grown to Euro/Global GAP standards, sorted and packed for European supermarkets, especially German and British.	for dried, processed products despite significant losses occurringduring drying. • Processing into powder and other products such as Shito adds substantial value.Branded shito and sauces are emerging. • North yet to develop sizable number of producers of final products Exports Fresh • Export market is buyer driven with varieties and prices determined by importers. • Southern producers report strong cost competitiveness and attractive profits despite low productivity • Exporters report success of shipments from North on pilot basis • Investment in northern supply chain with out-grower models and pack houses willtransform North into major exporter.	intensive crop • Value chain financing opportunities for traders to extend production credit to producers exist but are yet to be exploited. • Lack of credit restricts scale of trading and processing in the North. • Greater access to finance for exporters would enable investment in contract growing and pack-houses in the North. Business Development Services • Northern processors need BDS to make them more bankable and grow their businesses		overcome bottlenecks in supply chains in the North.

SECTION 2. MAPPING THE POOR AND OTHER ACTORS

2.1 THE POOR

The over 198,949 households involved in chilli cultivation are mainly small scale farmers growing chilli on very small plots of land. The majority (90%) of farmers are male, with women dominating in trading, retailing and processing aspects of the value chain. Field interactions with communitiesin northern Ghana growing chilli reveal that the crop's cultivation in the area used to be a female activity, until quite recently. Men have been compelled to become chilli farmers because of rising land pressure, declining farm sizes, reduced soil fertility and increasing difficulty for themto meet their household needs through farming grains.Farm sizes are generally small, ranging from 0.1 ha – 1.2 ha.

Turning a small plot of land to pepper cultivation providesmuch neededcash income, much of which is usedto purchase grain to supplement the family staplefood needs.Chilli farmers report that the crop is their main source of income. Although women are confined to the processing and marketing of the crop, it is still a major source of income for them. Chilli is a labour intensive crop, and smallholder farmers use both family and hired labour, thus it can also be a major income source for poor womenwho hire out their labour. The 2013 official minimum wage in Ghana was GHS 5.24 per day, however farms typically pay not less than GHS 8.00 per day for agricultural labourers. This suggests that women and men who supply labour to farmers are able to earn a good income though employment is on a casual basis.

The cultivation of chilli as a cash crop remains largely traditional with farmers using retained seeds, not investing sufficiently in natural fertiliser or agri-chemicals. The varieties grown are mainly traditional even though the use of modern varieties and inputs would increase incomes substantially. Pest and disease infestation and post-harvest losses contribute to undermining incomes. Limited access to markets in the south and export markets result in purchasing power lying with market intermediaries. Uncertainly over the market, caused by weak and informal relationships between actors in the value chain are among the constraints faced by smallholder farmers preventing them from adopting more profitable varieties.

Trading and processing also provide good incomes for women. The market queens who purchase the crop from farmers to sell to the local market and supply markets in the south for fresh chillies are relatively wealthy. But there are very many poor women involved in retailing fresh chilli and very many women involved in household enterprises that produce small quantities of dry chilli, up to about 5kg of powdered chilli at a time.

2.2 OTHER ACTORS

There are 5 types of markets for chilli namely:

(i) Farm gate – where farmers sell their produce (fresh and dry chilli) on their farms, along roadsides and in their homes. Women buy at the farm gate with market queens the dominant buyers.

(ii) Village/rural-town – these are retail markets which also serve as assembling points for wholesalers and sometimes processors. The retail trade is mainly conducted by women.

(iii) Roadside and 'parasite' markets – these are daily markets which have developed along the main road and outskirts of communities especially on market days. Assemblers often gather at these strategic points to intercept commodities from the village entering the community markets.

(iv) Large urban open air markets – located in the urban towns and cities, and are for both retail and wholesale sales. These markets also serve as assembling points where neighbouring urban or regional markets procure their produce. A large number of women are involved in retail trade.

(v) Supermarkets – found in urban centres, and mainly offer processed chilli products. The main chilli products found in the supermarkets are fresh chilli, dry chilli powder, paste and Shito. These are owned by major companies.

Marketing in the form of farm gate selling and at little village markets are common throughout the Savannah belt. In Northern Ghana, the major markets for chilli are the Tamale main market, Wa main market, Navrongo, Techiman, Kumasi and Accra. However, there are no established business links between producers and wholesalers in major marketing centres in the south thus permitting trading to dominate at farm gate with local traders (middlemen – mostly women) consigning chillies to their southern counterparts who wholesale the chilli.

In Northern Ghana, there are also two small chilli processing companies (Tamaiko Queen GAF) producing small quantities of chilli powder for the local market. There are concentrations of chilli processors in Kumasi and Tema, but they rely on spot buying of chillies as they are too small to drive the supply chain of processed chilli. Chilli paste is produced in Takoradi, the capital of the Western Region, and there is one majorchilli processor (EKA Processing Company) in Sunyani who processes dry chilli into powder form. The main ingredient of Shito, a very popular Ghanaian condiment, is powdered chilli. Several branded manufacturers sell Shito to supermarkets and large shops and two manufacturers are exporting the product to the UK.

There are 30 major exporters of chilli exporting mainly fresh green from Ghana. They are organised in two associations –Vegetable Producers and Exporters Association of Ghana (VEPEAG), and Ghana Association of Vegetable Exporters (GAVEX). These exporters are based in southern Ghana and have yet to establish market secure supply chains from northern Ghana. One or two are experimenting with using out-growers in the North to supply fresh chilli for export.

SECTION 3. MARKET GROWTH AND SEGMENTATION ANALYSIS

There is a fast growing domestic and international market for chilli (both fresh and dry-products). Pepper contributed GHS 2.01 million (7%) of estimated annual sales of GHS 29.51 million of fruits, roots and vegetables in Ghana in 2007[2]. The national consumption of chilli has been around 230,000 MT[3]. Consumption has been growing at around 8% p.a. Production has however, failed to keep pace with demand, increasing marginally from 270,000 metric tons in 2000 to 279,000 metric tons in 2008. Prices have increased strongly doubling between 2007 and 2010 but are still below world market prices. The price of chilli is low at harvest, but rises as high as 200% during the dry season, because chilli is rarely cultivated under irrigation[4] in Ghana.

Demand is growing as a result of its wide usage in Ghanaian dishes. Rising incomes have enabled the growing use of spices and condiments. The rise of a large hospitality industry and modern retail formats have led to new, large end users entering the market driving demand growth.

The heart-shaped (round) fresh chilli is most preferred in the fresh chilli market with the long and finger-like variety for drying – suitable for the dry chilli market. These varieties are largely cultivated in Northern Ghana. Themajority of the chilli traders (80.2%) deal in both fresh and dry chilli products with few in one product only. Chilli products sold include fresh, dried powdered, dry, shito and fresh paste as depicted in figure 1 below. The market for both fresh and dried is growing rapidly with the sale of chilli powder growing especially fast. The fastest growth, though from a low base, is in the sale of finished products such as shito, as they cater for the trend towards convenience amongst urban consumers.

[2] GLSS, 2008
[3] Assessment of the chilli sub-sector in Ghana report - 2010
4 Field interviews with chilli producers, northern Region

Figure 1. Ghanaian Chilli Products

Varieties of fresh ChilliChilli powder *Varieties of dry chilliShito*

The world demand and supply of chilli increased by 6.6% between 2000 and 2007 with Ghana occupying 11th position in global chilli production producing approximately 1 per cent of total global production[5]. Ghana is the fifth largest exporter of chilli peppers to the European Union, where the demand for chilli peppers has been growing annually at 17 per cent since 2000. Between 2000 and 2007, Ghanaian chilli exports ranged between 26,000 and 41,000 metric tons. Exports increased about 60 per cent from 2005 to 2007 since Legon 18 started being exported. However, chilli exports declined in 2008 due to the global recession[6] and disruptions in supply in Ghana caused by adverse weather conditions in the South.

Much of the chilli for exports is Birds Eye and Legon 18 which are grown in the south under rain fed conditions. The two rains allow near year round production which could be complemented firstly by the harvest in the North which falls between the south's major and minor rainfall seasons and secondly if the North could grow chilli under irrigation.

SECTION 4. VALUE CHAIN ANALYSIS

Chilli is widely cultivated in Northern Ghana, mainly under rain-fed production thus competing with other staple crops for land, labour and other productive resources. The average land holding is small as the crop is very resource intensive demanding large amounts of capital and labour. Chilli is currently cultivated under irrigation only in some parts of Northern Ghana, especially areas with dams and dugouts. This is done on an even smaller scale (very limited land area) compared to the rainy season cultivation.

Productivity is low (8mt/ha), far below the national achievable figure (32.3mt/ha)[7] due partly to poor quality of seed, bad agronomic practices, poor use of organic and inorganic fertiliser and pest and disease infestation. In the South, exporters often operate out-grower systems that result in the farmer gaining access to inputs and good agricultural practices (GAP). In Northern Ghana, where there is no major buyer or exporter, there is virtually no out-grower system, although linkages that result from repeated transactions between traders and producers prevail.

Buyers from the South do provide seed to some larger farmers and nominate women traders to whom the farmer should sell as agents for the buyer. As these relationships are not formalised, the buyers change and the new buyer introduces another variety. With farmers retaining seeds, this results in a large number of varieties being grown on the same plot of land, further depressing productivity. Most farmers retain seed and provide small amounts of inputs by themselves and sell on the open market. A few traders provide loans to some farmers they have worked with for some time, and the farmers sell their produce to them. This is the only form of out-grower scheme, but it is limited in scope and size of assistance.

[5]MiDA, 2008, GIZ, 2012 unpublished
6Investment Opportunities in Ghana Chilli Pepper - MiDA, 2010
7 GLSS – series 5, 2008

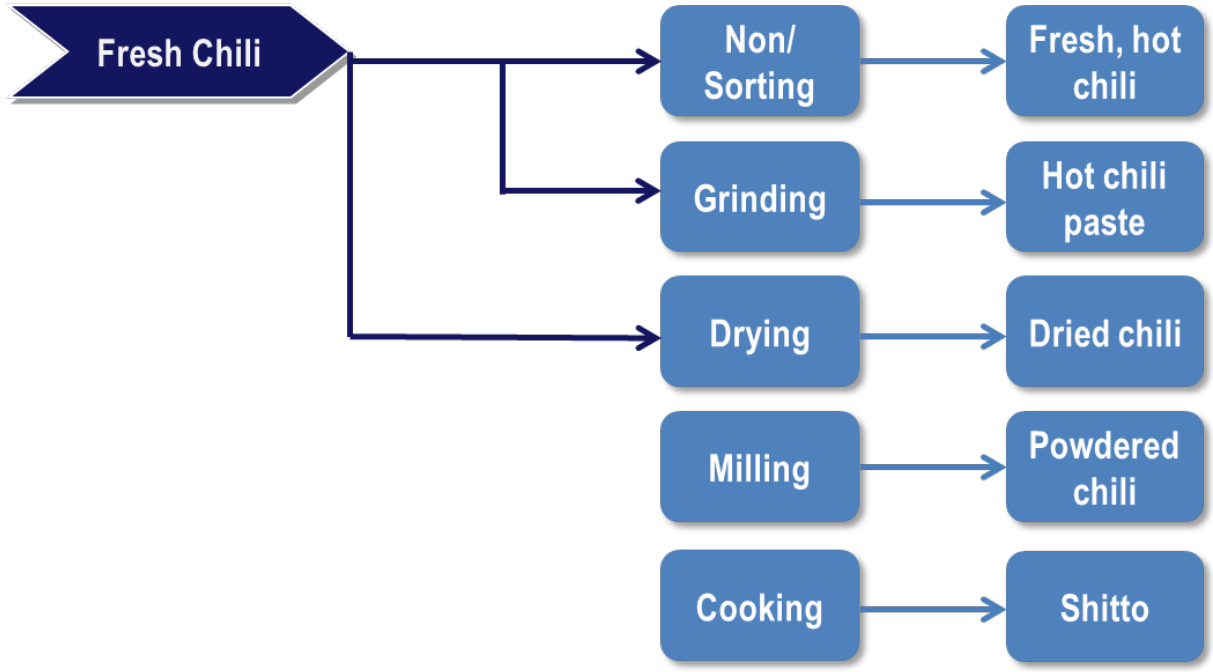
In the chilli market, profitability is exceptionally high (gross margin of $882/0.4ha) when using improved varieties (e.g. green-Legon 18 and Bird's eye) with the recommended crop agronomic practices and right proportion of fertilisation. Local varieties of chilli (Hwenyame) with good farm management and adherence of good crop agronomics is also profitable (gross margin of $316/0.4ha)[8].

However, neither the public sector (e.g., SARI, MoFA extension services) nor donor programmes (e.g.,GiZ's Market Oriented Agriculture Programme) have had much success in persuading farmers to use modern inputs, adopt GAP and switch to new varieties. The problem is that the farmer is resource constrained and, without access to external finance, unable to invest in the inputs and labour required. Further, without an assured market they are unwilling to grow new varieties which are not in demand in the local market. A good example is Legon 18, which is grown primarily for the export market.

Chilli processors transform fresh harvested chilli into other chilli products, including grinding the fresh chilli in a hot paste, or drying to obtain a dried chilli which is also the intermediary product for powdered chilli when milled. The powdered chilli is also used for producing "Shito" a local chilliproduct, when cooked with other ingredients.

Figure 2 illustrates the value addition processes in the chilli value chain.

Figure 2. Value Addition Processes of the Chilli Value Chain[9]



Post-harvest management is critical in chilli processing. Thus, drying is a key post-harvest handling issue and it is important as it increases the shelf life of the product. Farmers who are able to dry and store for a while earn higher incomes from chilli in the dry season, as the seasonal nature of the crop cycle is associated with high price variability. However, there are significant losses during drying. The traditional air-open method of boiling and drying is not appropriate (causes shrinking, colouring of chilli) for some chilli varieties resulting in high losses and poor quality dried products.[10] Modern blanching and drying practices, using low cost equipment, are limited to one or two beneficiaries of donor projects. Wider scale use could substantially increase value addition and incomes in the North.

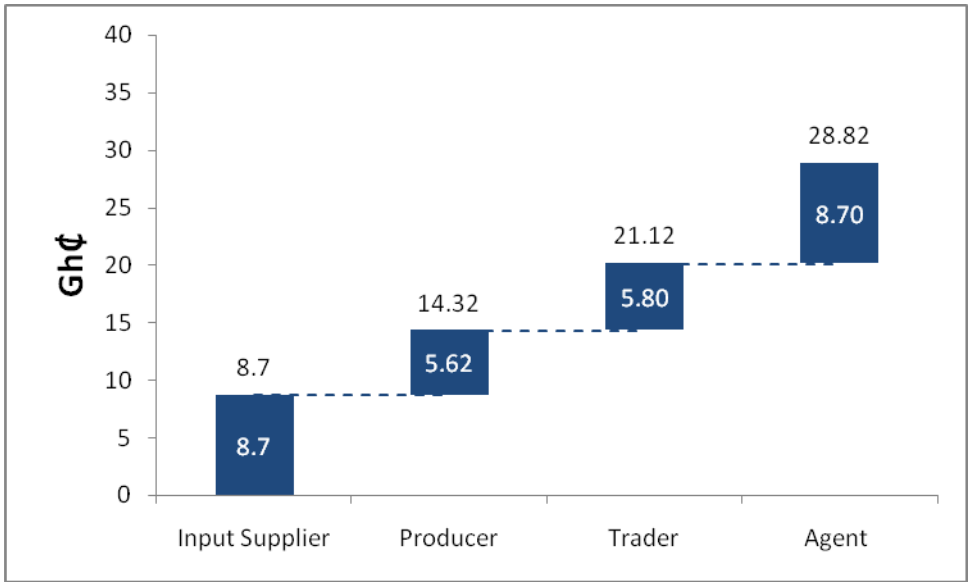
8 GIZ – Chilli Gross Margin Calculations, 2012

9 Adapted from Schipmann, 2006

10 Field interviews with producers in Northern Ghana

From value addition perspective, as depicted in Figure 3[11], there is high value addition (GHS 8.70) concentrated at the retailer level with the producer receiving the lowest value added (GHS 5.80) in the value addition chart. Market power rests with buyers who have access to final markets. This is due partly to farmers' need for cash, forcing them to sell immediately after harvest, but mainly due to the fact that the farmer is remote from the market and has no alternative but to sell through a number of intermediaries who all take a share of the final value created.

Figure 3.Mapping of Value Added through Input supply to Retailer at harvest



It is likely that producers could earn more than double their earnings if they are able to shorten the chain by selling directly to retailers in the market. Processed (value addition) chilli gives a higher share of margin to the producer than selling fresh chilli. Thus, a household earns more by integrating production and processing steps in the chain (i.e. additional activity of drying the chilli and making powder). Upgrading the skills of women traders involved in drying processes could enhance quality and lead to higher incomes. Some traders purchase more of the fresh chilli, and dry, store and re-sell during the scarcity period because of the higher prices available at the time.

Northern Ghana's smallholder farmers have the potential to scale up chilli production, improve productivity and earn higher income through use of good improved seed, export varieties, good agronomic practices and manure and fertiliser; adoption of better drying and processing methods; expansion of production under irrigation; and the establishment of organised supply chain including out-grower model with contract farming. This will enable Ghana produce enough to meet the rapidly growing demand in the domestic market and export opportunities and thus increase farmers' incomes.

11 Adapted from Analysis of Pepper Value Chain in Northern Ghana report, 2007

SECTION 5. ANALYSIS OF SUPPORT FUNCTIONS

5.1 RESEARCH

Despite limited funding, SARI is actively supporting the growth of the chillimarket. It has developed improved chilli varieties, developed GAP and methodologies for Integrated Soil Fertility Management (ISFM) strategies and green house drying and solar blanching techniques to chilli processors.

The critical constraints for the organisation are:

1. It works through the Ministry of Food and Agriculture's (MoFA) extension agents to disseminate the findings of its research organizing demonstrations for new varieties and GAP. The extension services weaknesses (see below) make this largely ineffective. It lacks the ability to use the mass media.
2. Its links with the private sector are weak and this prevents it fromcommercialising its research. Hence, it has developed a low cost dryer but has not been able to get private firms to develop and cost commercially produced models. Its new varieties of seeds need to be multiplied by seed companies but none have come forward to do so.

Commercialisation of innovations and improved technologies is slow because of the limited involvement of agro-input dealers in the development, trials and dissemination of findings to farmers. The agro-input dealers are largely not introduced to some of these new innovations and therefore are unable to project such innovations to their clientele. They lack the technical know-how to adequately disseminate appropriate findings/technologies.

Privately funded research is limited to foreign seed and other input supplying companies with representation in Ghana. The Ghanaian operations of these companies are small and products such as chilli, where the market for improved seed is limited to a few exporters, do not get the investment needed.

Facilitating linkages between SARI and the private sector to ensure that research responds to the needs of the market and to disseminate and commercialise the findings of research could help tomake theresearch system more responsive to market trends.

5.2 KNOWLEDGE ANDINFORMATION

MoFA extension officers are involved in conveying technical knowledge ofchilli cultivation, especially GAP,control of pests and diseases, soil fertility management and post-harvest management practices. However, the extension agent-farmer ratio is low and the extension service underfunded and poorly motivated, making it extremely difficult for farmers to access and utilise relevant extension knowledge to upgrade their productivity and quality.

Building the capacity of private organisations or other key stakeholders (e.g. agro-input dealers) could help improve farmers' access to relevant extension knowledge. However, with such low uptake of modern inputs, it is not worth major effort on the part of dealers to get to develop the expertise needed and ensure effective dissemination.

Introduction of the 'talk book"[12]innovation could facilitate farmers access to relevant information and technologies that enhances their businesses. This method requires minimal contact between the beneficiaries and the service providers but creates more room for regular interaction through a lead person selected from the community or the beneficiaries. Use of mass media would also help spread knowledge and disseminate information.

12 "Talk Book" – is an electronic devise use to record innovations for dissemination and also for providing feedback from beneficiaries as well as the innovator on emerging issues being disseminated

Farmers and processors, especially in the North are remote from end markets in the South and abroad. Access to information on market trends is slow to reach them and this prevents them taking advantage of new opportunities. Data on prices paid, the products in short supply, standards and quality required for success in key segments is scanty leading to mismatches between supply and demand.

5.3 IRRIGATION

There are a good number of dams and dugouts in the Savannah belt, but these water bodies are not routinely maintained and managed by the responsible authorities and beneficiaries to support dry season vegetable production –including chilli. Rehabilitation (e.g. re-embankment, de-silting) and strengthening of the water users associations could facilitate the expansion of irrigable area of these water bodies for vegetable cultivation in the dry season - which is an opportunity to produce for theSouth and export markets.

5.4 FINANCE

Chilli requires the investment of sizable amounts of capital. The area cultivated and the use of modern inputs are thus determined by the wealth of the farmer. Poorer farmers, with limited capital to invest, are dependent on rural banks and micro finance institutions (MFIs) to enable them to grow more chilli and increase productivity. Though the north has many rural banks and MFIs, most are undercapitalised and ill-equipped to make agricultural loans. Where possible, they work closely with NGOs and donor programmes to provide refer clients to them. Facilitating partnerships between the more capable and commercial banks who can provide them with wholesale finance, and training them in the cash flow requirements and success factors in chilli production could help to reduce the information asymmetries that underlie this constraint.

In addition, chilli is mostly sold immediately after harvest at a giveaway price due partly to the pressing cash needs of the farmer and trader/processors because of their inability to access finance to buy, dry and storechilli for sale when prices appreciate. Smallholder farmers' access to finance could reduce the quantity sold at farm gate at harvest, and encourage the household processing of chilli, especially using recommended practices and upgraded equipment (solar blanching, green house drying) into products (dried chilli, chilli powder).

The processors that currently can afford to buy only limited quantities of chilli and use inefficient technology could, with access to finance, both increase the scale of operations and invest in better technology. This requires that they are able to improve record keeping and the separation of their personal finances from that of the business. Access to quality business development services (BDS) as well as familiarising the banks with the cash flow and economics of chilli processing are needed to reduce information failures.

The key players such as major traders and exporters are unable to invest in the sector especially in the North because of limited incentives and funds. Greater access to finance for exporters will enable them to invest in contract growing and pack-houses; and to train farmers to adopt good agronomic practices, including cultivation of export varieties that meets the export specifications. Traders with good access to financing opportunities should be able to extend production credit to farmers to expand and grow varieties that suit their target markets. These financing opportunities and business services (i.e. training) when made available to the chilli producers will help to encourage more productive farming that results in higher incomes as well as to develop the domestic and export markets for chilli.

SECTION 6. ANALYSIS OF POLICIES AND INSTITUTIONS

6.1 POLICIES

Whilst policy makers at the national and regional level are well aware of the potential that chilli offers, they have yet to develop specific policies to promote the crop. SADA too is aware of the crop's potential but it has also yet to develop a coherent policy for the crop. Chilli therefore benefits from the general policies that are pursued to promote agriculture, such as fertiliser subsidy, but no attempt has been made to assess where market failures are causingproduction bottlenecks or reducing value addition in the value chain.

As a result, broad based policies for agriculture miss the mark for chilli. For instance, seed subsidy is not directed towards seeds for chilli and fertiliser subsidy only benefits the rainy season crop. Better targeting would reduce abuses, such as traders from neighbouring countries smuggling fertiliser across the border, thus making more chemical fertiliser available for dry season farmers. Besides, the focus onchemical fertiliser rather misses the mark for chilli as what the North, with its soils depleted of organic matter, really needs is promotion of the use of organic fertiliser which is particularly important for growing chilli.

Allied to lack of a crop specific policy is poorly developed public institutions that make it difficult to implement all agricultural policy. As noted earlier, research and extension institutions are underfunded. That applies also to the Ghana Irrigation Development Authority (GIDA) which is responsible for dams and dugouts.

As important as funding is governance over these institutions. In general, their management is not held to account for delivering results and nor has it been tasked to develop strategies to work with the private sector or civil society to leverage their capabilities and networks. Facilitating the involvement of the private sector in research and development and extension education will enable the dissemination and commercialisation of research findings and extension information to target beneficiaries.

Public sector organisations, such as the Ghana Export Promotion Authority, Ghana Standards Authority and Food and Drugs Authority, provide export trade support by facilitating the promotion and development on non-traditional export goods (including chilli), the development and enforcement of standardisation and food quality control, including the enforcement of international quality standards. The activities of these service providing institutions appear to be most useful for export commodities, as quality awareness on the domestic markets is very low.

6.2 DONOR PROGRAMMES

What government has done is to hand over the task of developing the chilli potential of the North to donor funded programmes that it is undertaking.As part of the Government of Ghana's policy to commercialise vegetable cultivation in the Savannah belt, the Northern Rural Growth Programme (NRGP) has named chilli as one of the vegetables to promote. However, specific policies and interventions are yet to materialise. The vegetable window has not been contracted out to a technical service provider to facilitate its value chain arrangements.

The Market Oriented Agriculture Programme (MoAP) implemented by GIZhas been analysing and intervening in the chilli value chain for many years. IFDC and GIZ have also promoted some interventions geared at integrating smallholder farmers into the domestic and international markets that enable farmers to increase the supply of raw materials and also participate in adding value activities to strengthen their position in the chain. However, the coverage of all these useful innovations/interventions is limited in scale in Northern Ghana. It is however now scaling down its involvement. The chilli initiative in Northern Ghana is now limited to only 300 chilli producers. GIZ and ADRA have also done some work on chilli production and productivity, but these initiatives are limited to few communities in Northern Ghana.

These interventions need to be rethought if they are to be scaled-up. The involvement of capable players in the chilli value chain and the establishment of supply chains from southern exporters and major buyers in the Savannah belt are crucial for success.

SECTION 7. IDENTIFICATION OF SYSTEMIC CONSTRAINTS

From the above analysis of the chilli market sector, the following are systemic constraints, caused by several market failures coming together, and lie at the root cause of why the market for chilli produced in the North is failing to fulfil its potential:

- Undersupply of public goods (research, extension, irrigation).A number of improved varieties, GAP and processing technologies have been developed by SARI, but these have not been widely disseminated or commercialised due to institutional failures in the public sector and their failure to partner with private institutions that have an incentive to collaborate with them (e.g.,input suppliers& distributors, exporters, equipment manufacturers). The supply of other public goods such as extension to develop knowledge of GAP and control diseases and pests and irrigation facilities are similarly undersupplied. This weakens the incentive and ability of participants in the market to innovate to improve productivity and profitability.
- Failures in market information and weak supply chain linkages: Knowledge of market trends and what the market needs (products, standards, packaging, price points) is patchy largely confined to large buyers/exporters in the South and the market intermediaries operating in large open-air markets. The farmer is poorly informed and remote from end markets and so reliant on infrequent contacts with buyers to respond to market opportunities. Information on how farmers can maximise incomes has been produced by GIZ/IFDC but has not been conveyed convincingly or widely. Farmers are yet to be convinced that the risk of switching to new varieties is worthwhile.
- Coordination failures cause bottlenecks across the value chain. The presence of a large number of small actors, each with spot buying/selling relationships with actors up and down the value chain, combine with information failures to cause bottlenecks in the value chain. For instance, even if SARI was able to convince farmers to switch to new varieties, there is a shortage of seeds to enable farmers to switch. And, market intermediaries are uncertain of the reception that the new varieties would get in the market. The 'invisible hand' of the market provides price signals but their transmission is weak. There is a need to crowd in larger, more capable players from the South who have the market power to coordinate the value chain.
- Financial market failures: A combination of financial institutions that are unable to distinguish good borrowers from bad and the lack of credit ratings and capabilities amongst banks and MFIs that make them high risk borrowers for the commercial banks to lend to undermine access to finance. The rural banks and MFIs have the products and low transaction costs to potentially lend uncollateralised successfully but their failure to invest in training of staff and systems prevents them from realising that potential. Competition in the markets is limited by the presence of donor supported wholesale finance. Access to finance is a constraint to productivity and income enhancing innovation and investment for farmers, traders, processors and large buyers from the South.
- The poor investment climate in the North reduces the incentive for large buyers/exporters in the South to invest in the North. Exporters based in the South have recognised the competitiveness of the North and have undertaken pilot trials with good results. However, problems with roads, refrigerated transport services, electricity for cold stores and pack houses and distance to the market reduce their incentive to invest.

SECTION 8. CONCLUSION

Chilli is a major crop which has strong potential to improve incomes and contribute to growth in the North. Even under traditional cultivation practices, farming small plots of land provides the majority of the incomes of the farmers that produce chilli, enabling them to buy grains and pay for essential household expenditure. It provides far better incomes than grains. This labour intensive crop also provides opportunities for women to supplement incomes through casual labour, trading and the processing of chilli.

With modern varieties and GAP, the crop provides a pathway out of poverty for farmers, more on-farm and off-farm employment and an opportunity for the North to develop its nascent agricultural processing enterprises to increase value addition and hence growth. The crop connects the North to affluent consumer markets in the South and modern varieties would open up attractive markets in Europe and the Middle East. The North has competitive advantage over the South and is internationally competitive.

This huge potential is, however, largely unfulfilled. The market system in the North is stuck in a low input/low output equilibrium failing to respond to market opportunities. Unlocking the potential requires addressing the systemic constraints that are preventing innovation and market responsiveness.

MADE could address these systemic constraints through a combination of influencing, facilitation and judicial co-investment with the public and private sectors to promote pro-poor innovation:

1. Facilitating the increased supply of public goods through:
    - MADE's communication function would partner SARI to disseminate research
    - MADE would build public private partnerships to commercialise new technology and make extension more effective. It would help develop better PPP arrangements between progressive water users associations that recognise the value of chilli and GIDA to increase access to irrigation.
2. Facilitate greater media coverage of market trends and success factors in the market for chilli.
3. Incentivise BDS providers to provide training and business services to progressive trader/processors to enable them to grow their businesses and build more stable market relationships with suppliers and buyers.
4. Facilitate the commercial banks to partner with rural banks and MFIs to address access to finance for farmers and fund progressive chilli marketing and processing enterprises themselves.
5. Crowd in established, capable buyers and exporters from the South and incentivise them to coordinate market actors build stable supply chains that are inclusive of smaller, poorer farmers.
6. Provide platforms for actors to coordinate their activities and help to facilitate alliances and partnerships in the private sector.

ANNEX A – GENDER ANALYSIS

MADE Gender Market Screening Form		
Market name	**CHILLI**	**Assessment Colour Code**
1. Description	Chilli is the 2nd most important vegetable crop after tomatoes, and is cultivated by over 198,949 smallholders in northern Ghana. Production largely relies on rain-fed and irrigation, but there is potential for dry season cultivation as it is a low water requirement crop. Production is done mainly by poor smallholder farmers (men and youth). It is a very labour intensive crop and uses both family and hired labour. Chilli is a substantial income source for producers and women traders.	
2. Gender sensitivity (How gender sensitive is this market?)	Chilli was initially a women's crop but commercialisation has crowded out women and crowded in men in cultivation. Women, however, dominate in processing and trading. They process chilli into powder, paste and other end products like 'Shito' and trade in fresh and dried chilli on the local markets. Recent investment in the north has produced two small processors of chilli but they are too limited in operation to be a threat to individual women processors.	
3. Contribution to negative gender effects	Inadequate access to finance reduces women's ability to acquire drying and storage facilities and improved processing and packaging technologies leading to poor quality processed chilli, low price and low incomes. Women's lack of information about the availability of support systems from NGOs and GoG could hamper their ability to take advantage of such support to improve their productivity and income.	
4. Opportunities to adapt to or mitigate these negative effects	Scaling-up the innovations and interventions currently in place (SARI/IFDC/GIZ) could increase the supply of chilli varieties that are processed by women. Improvement in the drying and storage facilities could enable women to engage in trading and processing into the dry season when their labour is less constrained. With better access to finance, women could invest in better drying and storage facilities and improved processing technologies allowing them to better capture and benefit from the intra-seasonal price increases. Access to improved processing equipment for women could increase productivity, resulting in increased volume and quantity traded, leading to higher incomes. Women can also adapt to the business opportunity of convenient packaging of the varied end products to better satisfy consumer preferences and make products more accessible to the consumer. Improved drying and storage facilities could allow women to	

	work through more of the year, allowing them to capture the inter-seasonal price increase.	
5. Gender promoting measures	The gender promoting measures to employ are as follows: • Increase awareness and access among women of/to better facilities and improved technologies • Facilitate training in BDS as well as packaging and distribution • Facilitate access to NGOs and GoG support systems for women in agricultural processing • Facilitate MFIs and other financial institutions to develop suitable agricultural financial products for women • Facilitate platforms for knowledge sharing with lead women chilli processors	
6. Obligatory gender mitigating measures	As chilli is not highly gender sensitive, the need for mitigation is low. Activities in the market that increase yields will benefit women by increasing the supply for processing and trading. The need is to take a longer term view of the role of women in the market and consider suitable interventions. Obligatory mitigation should be incorporated at the intervention level.	
7. How will gender promotion measures be monitored?	There will be a yearly assessment by the Gender Specialists with inputs from the Market Development Specialist.	
Risk colour coding	Low	Medium / High

ANNEX B – ENVIRONMENT & CLIMATE CHANGE ANALYSIS

Intervention/ component name		Chilli	
1. Description		Dry season irrigated crops, also grown rain-fed in wet season with some supplementary irrigation. Chilli concentrated in the Savannah belt of Ghana. This component will focus on supporting farmers with application of good agricultural practices such as the use of improved high yielding varieties of both local and export varieties, improve agronomic and post-harvest practices (e.g. drying) as well as improved processing and packaging techniques.	Risk
Risk from Climate Change	2. Sensitivity of the intervention to risks from CC	Relatively climate resilient cropping pattern but: Offseason farming (60%) can be affected by insufficient water and excessive heat; Rainy season farming (40%) can be affected by flood, poor rains and late start of rains. These crops can provide increased resilience through diversification.	Without adapt.
	3. Opportunities to adapt to these CC risks	Planting early maturing varieties, use of drought resistant varieties, coaching farmers on efficient use of water and water management practices. Research into early maturing and drought resistant varieties – there may be some new market opportunities in seeds and agrochemical inputs.	With Adapt
CO_2/GHG emissions	4. Contribution of the intervention to CO_2/GHG risks	Relatively small. Some limited adverse effects from clearing riverbank land – loss of vegetation and soil carbon.	Without Mit.
	5. Opportunities to mitigate theCO2/GHG risks	Closely linked to good riverbank management (see environment below)	With Mit.
Environment risks	6. Risks to the environment from intervention	Clearing of riverbank land for cultivation can create severe risks – with a range of biodiversity, erosion, flooding and siltation outcomes. Extraction of water for irrigation can reduce availability for other users. In larger irrigation schemes poor management and inadequate drainage can lead to salinization. Small risks from increased agrochemical use.	Without Mit.

	7. Opportunities to mitigate the environment risks	Researching and promoting sustainable river bank cultivation techniques. LEISA (i.e. Low External Input and Sustainable Agriculture). Facilitating farmers' access to pumps can increase distance of cultivation from river bank, facilitating sustainable management. Promoting efficient use of water.	With Mit.
8. Summary		A relatively climate change resilient crop – but with dependence on access to dry season water. The environmental risks from riverbank cultivation can be managed by improved practice.	
9. Obligatory mitigation or adaptation measures		Any market intervention on these crops which seems likely to lead to an increased area of cultivation will be accompanied by promotion of sustainable cultivation and irrigation techniques.	
10. Overall Risk assessment after mitigation		Low from climate change, high from environmental impact of riverbank cultivation – but this should be able to be mitigated by improved practice.	
11. How will the mitigation/ adaptation be monitored?		A random sample of producers will be visited on an annual basis and the sustainability of their practice will be monitored in respect to: 1. Maintaining anti-erosion vegetation barrier on the riverbank. 2. Prevention of soil erosion. 3. Prevention of salinisation. 4. Safe use of agrochemicals. 5. Over-extraction of irrigation water to detriment of other users. 6. Continued availability of irrigation water.	
Risk colour coding		Low / Medium / High	
In order to be approved, none of the risk assessments after mitigation/adaptation (Rows 3, 5, 7 or 10) can be red.			

ANNEX C – POLITICAL ECONOMY ANALYSIS

MADE Political Economy Market Assessment	
MARKET	**CHILLI PEPPER**
Stakeholder mapping	
1. Who are the "most influential" stakeholders or stakeholder groups in the market?	The domestic market is fragmented, with the major markets located in Techiman, Kumasi, and Accra, as well as in Tamale, Wa, and Navrongo. There are generally no pre-production contractual arrangements between smallholder farmers and traders. Local traders, mostly women, typically aggregate produce through farm-gate purchases from farmers at harvest time and sell them to other bulkers/wholesalers. There are a small but growing number of chilli processors, including two in the North (Tamaiko Queen, GAF) and one in Sunyani (EKA Processing Company). However, these processors do not, individually or in the aggregate, operate at a large enough scale to drive the market or supply chain. There are over two dozen exporters (exporting both dry and fresh chilli), all of them located in southern Ghana. These include two associations, the Producers and Exporters Association of Ghana (VEPEAG) and Ghana Association of Vegetable Exporters (GAVEX). None of the exporters has a direct supply chain relationship or out-grower or other contract farming arrangement with Northern growers. Market power in the chilli value chain is tilted in favour of the buyers/traders who play a greater role in determining prices, especially during bumper harvests. Even though individual FBOs discuss prices, it is often difficult to agree on fixed prices or enforce such informal agreements. As there is no ready/guaranteed market for the produce, individual farmers search for market for their produce and could decide to sell below agreed price for many reasons.
2. Is there a presence of legitimate and credible stakeholders?	There are currently no such stakeholders in the market as producers remain largely peasant, smallholder farmers.
3. Is there a national politician or other influential political actor (e.g., national or regional "best farmer") who has a notable interest in or 'champions' the interests of any of the participants in this market?	No known individual champion. There are at least three associations, the Vegetable Producers and Exporters Association of Ghana (VEPEAG), National Vegetable Growers Association and Peasant Farmers Association of Ghana, that have undertaken some advocacy in the past on behalf of vegetable growers generally.
4. Are there vested interests that can block, derail or sabotage policy and institutional change?	There are no apparent vested interests that are aligned against the interests MADE seek to advance. The only market participants that that might feel threatened by interventions designed to enhance the earning power of farmers are the local buyers/market women. But they are not so organised as to derail efforts at change. Other buyers like the Vegetable Producers and Exporters Association of Ghana (VEPEAG) equally have vested interests and could prove potential partners in any interventions that will promote chilli

	cultivation. VEPEAG, which is a national association, has supported farmers through contract farming in the chilli sector. Their role could therefore be complementary rather than competitive.
5. Are farmers in the market organized collectively? Is there a representative farmer based organisation?	Through its Market Oriented Agricultural Programme, GIZ established FBOs and built their capacities in best farming, marketing and storage techniques. There are currently about 15 FBOs in four districts in the Northern region: Tolon, Kumbungu, Savelugu-Nanton and Tamale. A value-chain committee was set up comprising of producers, marketers, processors, input dealers, etc. which meets once every 2 months to discuss pertinent issues affecting the value-chain participants. There is also a larger umbrella body called the TOKSAN (Tolon-KumbunguSavelugu-Nanton Chilli Pepper Producers Association) which meets periodically to discuss challenges confronting members. These FBOs are linked vertically to GIZ and the value-chain committee with little or no horizontal relationship with other FBOs. All the FBOs and the value chain committee are currently being coordinated by MOFA since the end of the GIZ MOAP programme in December 2013.
Institutional assessment	
6. Are there any policies/regulations/norms in the market that could limit or facilitate MADE's interventions?	The Northern Rural Growth Programme (NRGP) identifies chilli pepper as one of the vegetables to promote commercially. SARI has introduced improved chilli varieties, Integrated Soil Fertility Management (ISFM) strategies and green house drying and solar blanching techniques. Fertiliser subsidy is usually unavailable for dry season farming.
7. Which are the key public sector institutions, agencies and offices (national, regional, or local) relevant to the market?	SARI has a key role to play in research to improve variety and quality of chilli cultivated. The MOFA also has a role to play in facilitating access to fertiliser and other inputs for chilli farmers to increase their yields.
8. What platforms or forums are available and accessible to farmers, FBOs and other market participants to engage with policymakers or the policymaking process?	There are currently no known platforms besides the value chain committee meetings, whose deliberations do not necessarily get passed on to policy makers.
9. Do traditional authorities and other customary institutions play any role in the market?	Traditional authorities and or customary institutions do not play any significant role in the market. Traditional authorities can however play such a role by facilitating access to land for women, who are traditionally known to be involved in chilli production.
10.Are there capable private market participants in the market?	The Export Development and Investment Fund (EDIF) can play a key role in granting credit facilities to chili farmers and exporters and also assisting buying companies/individuals to acquire export certificates which has a very cumbersome process. Other financial institutions like banks can also play a key role in granting credit facilities to farmers.
Summary	
11. Overall assessment	Overall, the political/market risk to MADE is low. There are no

	influential stakeholders in the value chain who have strong vested interests in the current state of affairs or whose interests are strongly antagonistic to MADE. Rather, there are untapped opportunities to link growers and exporters/large processors in a win-win arrangement. MADE must build on the experience and legacy of GIZ with regard to dealing with FBOs. Although there is minimal explicit policy support for chilli pepper specifically, the overall policy and regulatory environment is favourable. Additional political support exists in the prospect of using MADE to further develop chilli as an export cash crop.

ANNEX D – LIST OF RECENT AND ONGOING RELATED PROGRAMMES

Full name of project	Market	Organisation	Geographical areas of intervention	Start and end year	General Description
Market-Oriented Agricultural Programme	Chilli, guinea fowl and mango	GIZ	Northern Ghana	2004-2013	The programme consists of three components: • Promotion of selected agricultural value chains • Increasing efficiency of the public sector • Strengthening of private sector institutions These include measures of policy advice, institutional development as well as introduction of technical innovations. In agreement with the Ministry of Food and Agriculture the following value chains are promoted: pineapple, citrus, mango, chilli pepper, grasscutter, guinea fowl, and aquaculture. The programme enables producers and processors to increase production volumes and to adjust the quality of primary and processed produce to suit market requirements. It furthermore advises the ministry on the implementation of decentralised organisational reforms, improvement of service delivery, and private sector support. Agricultural organisations and associations are assisted to improve their institutional set up and the service delivery to their members. Strengthening of public private sector cooperation is another focal point.