

# Input Supply Structure for Yam Production in Ghana

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## Abstract

Yam is an extremely important crop for at least 60 million rural poor producers, processors and consumers in West Africa providing multiple opportunities for poverty reduction and nourishment of poor people in the sub-region. Despite the importance of this crop, its production is stagnating, thus threatening rural livelihoods and urban food security. Input supply dealers to the yam sub-sector are quite scanty and rather focused on general agro inputs. Literature on the structure of yam input supply systems is scanty and non-existing. This creates inefficiencies in supplying the necessary inputs for production affecting productivity of the production process. The objective of this paper is therefore to provide a structural analysis of the input supply system and the role input dealers play in providing products and services to the production process. Through the use of stakeholder analysis and structured interviews, results revealed that 50% of agro input dealers interviewed provided herbicides to farmers. Information on input on high demand was through extension (43%) indicating the relevance of the extension services in information delivery. The most common form of assistance was training (42.86%) followed by advisory services (28.57%) with limited access to credit (4.29 %). Gross margins were quite favourable such that seed yam had gross margin of GHC 30 per 100 tubers, agro chemicals was GHC 5/litre and fertilizer GHC 2.67/Bag. Strengthening the capital base of input dealers will make them more efficient to serve the production system effectively and productively.

**Keywords:** *Input dealer, yam production, labour, seed yam, agro inputs*

## 1. Introduction

Yam is an extremely important crop for at least 60 million rural poor producers, processors and consumers in West Africa providing multiple opportunities for poverty reduction and nourishment of poor people in the sub-region (Aidoo et al; 2011, IITA& EIARD, 2013). This is not different from Ghana where the crop is the most important food crop in terms of output value (Asante et al; 2014). It contributes about 17 per cent of agricultural gross domestic product and also plays a key role in guaranteeing household food security (Kenyon and Fowler, 2000). Ghana is currently the leading exporter of yam (36 per cent of world exports) and it ranks second after pineapple among Ghana's non-traditional exports (Asante et al; 2013). Out of the total agricultural land under cultivation (7,846,551ha), yam cultivation occupies 387,000ha representing 4.9% (MoFA, 2011). A total of 5,960,000MT of ware yam was produced in 2010 which came second to cassava of 13,504,000MT (MoFA, 2011). Its importance lies in the fact that it serves as both food security and income generating crop. Its cultivation cuts across the forest, coastal savannah, forest transition and the guinea savannah agro ecological zones of Ghana.

Despite the importance of this crop, its production is stagnating and thus threatening rural livelihoods and urban food security. It is the most expensive of the root crops to produce because of the high labour demands for land preparation, planting, staking, weeding, harvesting and transport to market. Also, planting material (seed yam) is expensive and in short supply because of the low multiplication rate of yams (Aidoo et al; 2011). Input supply dealers to the yam sub-sector is quite scanty and rather focused on general agro inputs. This is corroborated by Djana et al (2015) who stated yam is produced mainly with crude inputs/technologies to reduce high dependence on labour, seed production and control of pests and diseases. The objective of this paper is therefore to provide an insight on the role of input dealers in providing products and services to the production process.

## 2. Methodology

Data for this paper was elicited from primary survey data collected as part of the functional analysis of the Ghana yam value chain study under the West African Agricultural Productivity Programme (WAAPP). Stakeholder meetings were held at the district capitals comprising farmers, traders, policy makers from the district assemblies, Agricultural extension, research, Ghana school feeding programme, media, metrological department and NGOs. Stakeholders were divided into focus groups and with a checklist and the help of a facilitator discussed issues affecting input supply system. To complement the informal discussions, standard survey questions were administered to a total of 16 agro input dealers across four districts in four regions. The multi-stage sampling technique was used to select four districts namely; East Gonja, KwahuNorth Afram plains, EjuraSekyeredumase and Techiman municipal to represent Northern, Eastern, Ashanti and BrongAhafo respectively were the main survey took place. Respondents were interviewed through face-to-face technique. Data was analysed using descriptive statistics and graphs.





### 3. Result and Discussion

Labour available to households defines the human capital that becomes the basis for farm household input use in production. One of the major inputs in growing yams is that of labour, which has been estimated to account for as much as 30% (Marchand&Girardot, 1999), 40% (Nweke *et al*, 1991) or 54% (ICRA, 1996) of total operating costs. In the context of yam production in Ghana where farm mechanization is virtually nonexistent and all farm work is done manually, having access to the necessary labour for production directly affects the levels of household farm output, income and orientation in market economies (Moro, 2013). Labour in the study areas was one of the key inputs for production applied at almost every level of the production process. That was at land preparation, planting, farm management, harvesting and at post harvest level. Labour was acquired from two main sources namely; family labour and hired labour which is consistent with Djana *et al* (2015) who stated yam is produced widely with purchased inputs including family and hired labour. Family labour was more pronounced with hired labour coming in as a supplement in the study areas. Hired labour was mostly acquired at the land preparation stage when farmers were raising their yam mounds. Planting, farm maintenance and harvesting was mostly done by family labour with support from hired labour. Another form of labour which was quite peculiar to the East Gonja district was communal labour. This type of labour involved friends and relatives

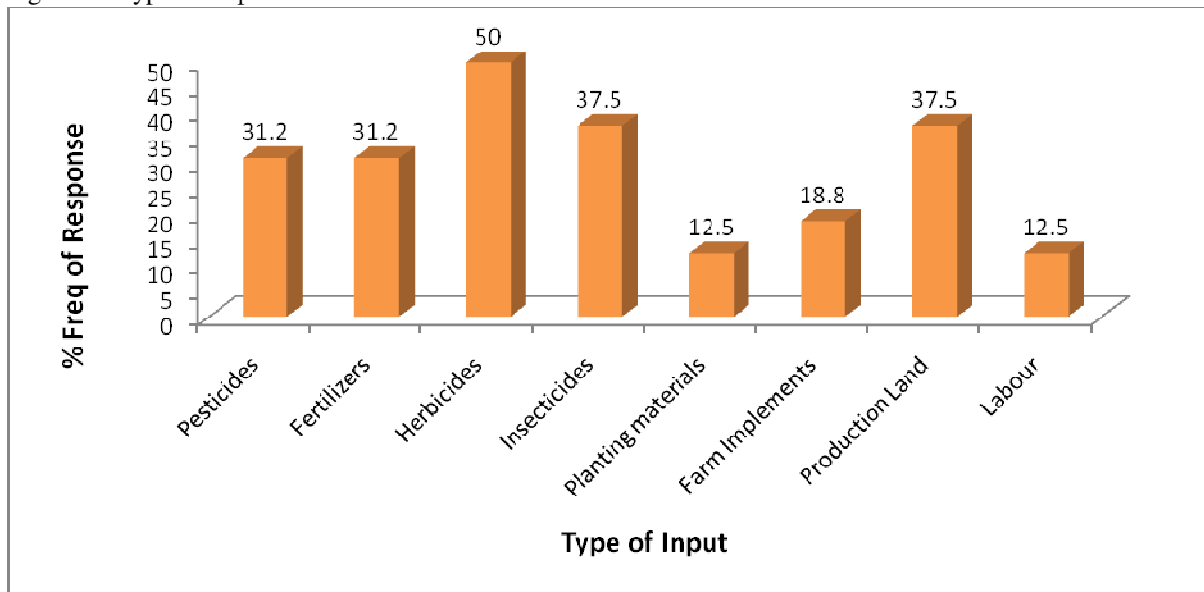
coming together to support another friend or a relation in farm operations. This form of labour was however gradually going down due to migration, school enrolment and gradual increase in farm size. Labour was gradually becoming scarce due to the same factors. Hired labour was mostly provided by settlers who at the peak of planting season also migrate to establish their own farms.

Seed yam was the main planting material for yam production in the study areas. Obtaining good quality planting material for yam cultivation is a major challenge due to low multiplication ratios. Seed tubers are prone to contamination with pests and pathogens in the traditional systems of production (Aighewi; 2015). In Ghana, farmers have traditionally relied on obtaining their planting material either from their own farms or by buying the surplus from neighbouring farmers. This means that the planting material is often of low quality, being infected with fungal pathogens, virus and/or nematodes, and may be relatively expensive. The habit of retaining small and misshapen ware yams for seed for the following season probably exacerbates the problem of diseases and pests since these are the ones most likely to be infected (Peters, 2000). This was the situation in the various districts visited such that different types of seed yams were used depending on availability, variety and location. The common system was the use of setts milked before harvesting of ware yams, use of smaller ware yam tuber which is sometimes cut into smaller sizes and the miniset technology which though on a smaller scale. This findings collaborates Aighewi et al; 2015 who were of the view that some approaches to producing quality seed yam were as follows: farmers select small whole tubers from a ware crop harvest; stimulate the production of seed tubers by 'milking' ware tubers while the leaves of the plant are still green (double harvest system); cut ware tubers into setts about the same sizes as regular seed tubers; or use the 'Anambra' system where smaller setts are cut and used to produce seed tubers. The type of variety and time of the season determined the price of the seed yam. Seed delivery system in the study areas were farmer-to-farmer and seed intermediation through nearby yam wholesale markets. The farmer-to-farmer system dominated in all the districts visited. This issue affects the production of ware yams and eventually food security. According to Aseidu et al (2009), about 30-50% of yam harvested is use as seed yam. Asumugha et al. (2009) noted that the biggest problem is that many farmers cannot afford to buy good-quality planting materials. This means that they have to save as much as 10 to 30 percent of the tubers they harvest to plant the next season. This did prevent producers from expanding the area under cultivation, despite the availability of fertile land and demand for yam domestically and abroad. To this effect, attempts have been made in introducing improved technologies for producing seed yams. By adopting the mini sett technology, only 5-10% of yam harvested will be required to produce seed yam (Aseidu et al; 2009). There is also the viability of producing seed yam on commercial basis using tissue culture to generate foundation seed (Meda, 2011). The development of yam certified seed producers in Ghana will go a long way to solving the issue of scarcity and high cost of seed yam.

The role of the agro input supplier is very important in the yam value chain. Farmers acquired farm tools such as hoes, cutlasses and harvesting tools from these input suppliers. They also sell agro chemicals to farmers normally used in treating seed yams before planting. Farmers rely on them for the pest and disease control by acquiring insecticides and fungicides from them. Their cliental go beyond farmers but also institutions and Non-Governmental Organisations (NGOs). At Salaga in the East Gonja District, Savannah Research Institute (SARI) was mentioned as an organisational client who purchased inputs for farmers on their projects. Inputs suppliers are found normally at the district capitals and some within farming communities depending on the size and level of development in the community. Stocks for these input dealers are source from nearby urban centres such as Tamale, Kumasi and Accra. Depending on the working relation with the farmers, some input dealers extend credit facilities to the farmers. The input dealers as marketing strategy offer some value added services in the form of free advice to farmers on chemical application and use of protective clothing. This was dominant in East Gonja and Kwahu north districts. Some suppliers again offer discounts as well as free transportation depending on the quantity of purchase. Input suppliers finance their operation from their own resources with limited support from financial institution. One major limitation in the supply of inputs was the lack of proper monitoring of how agrochemicals are stored and used. Some of the agro chemical dealers have not been through any formal training to build their competence in the use of these chemicals. They are however the first point of call for farmers on the use of these chemicals. This might be the possible reason for the perception that yams get rotten when fertilizer and other agro chemicals are used. Proper training and regulation of these agro chemical suppliers will help improve the use of fertilizer and other agro chemicals in yam production.

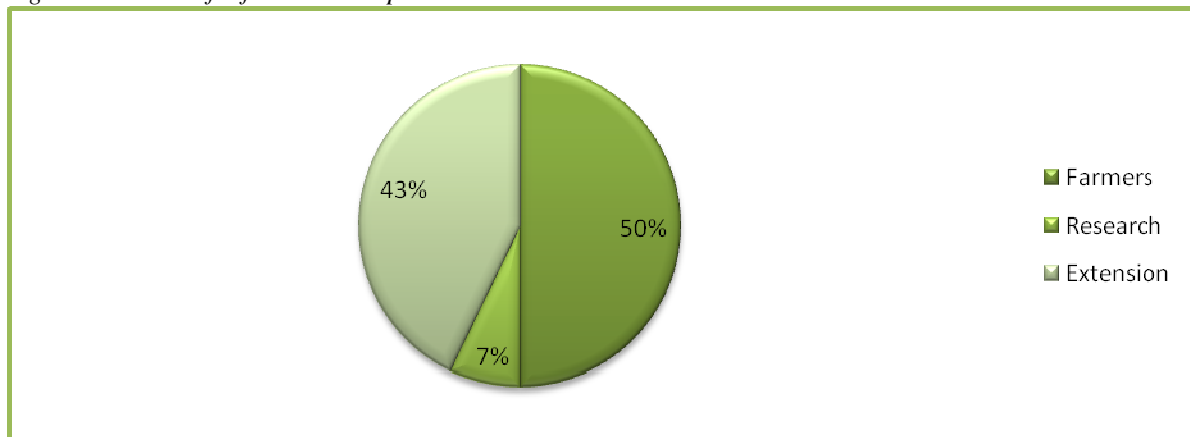
Input dealers were a critical actor in the value chain. They provided various inputs to the chain which served as raw materials for production. Several inputs were provided such as chemicals, planting materials, farm implements, land and labour. Four main types of input dealers were identified. That is agro input dealers, land owners, planting materials suppliers and labour. More input suppliers were in client to providing agro chemicals with 50% providing herbicides to farmers. About 37.5% of input dealers interviewed provided land to the actors of the chain with 12.5 % providing labour. What was clear was the provision of multiple services to the chain.

Figure. 6: Types of inputs



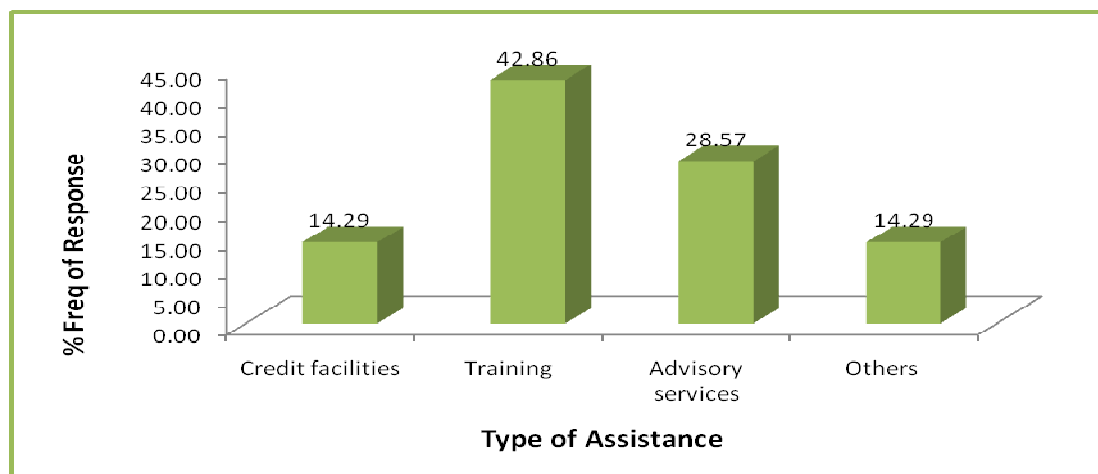
Input suppliers did rely heavily on farmers as to which inputs to supply. This is due to the fact that farmers are the direct actors input dealers dealt with on a constant basis. About 50% of respondents indicated their primary source of information was from farmers (Figure 7). This means education on the use of safe chemicals could be channel through input dealers since they have constant interaction with farmers for maximum impact. Extension was also another major source of information to input supplies. About 43% of respondents had information through extension. This means the role of extension in information dissemination is still very relevant and should be supported. Seven percent (7%) indicated they had information from research since most technology transfer is mostly done by extension and not research. These means there is the need to integrate research and extension to enhance the role of research in technology dissemination and adoption.

Figure 7: Source of information on products



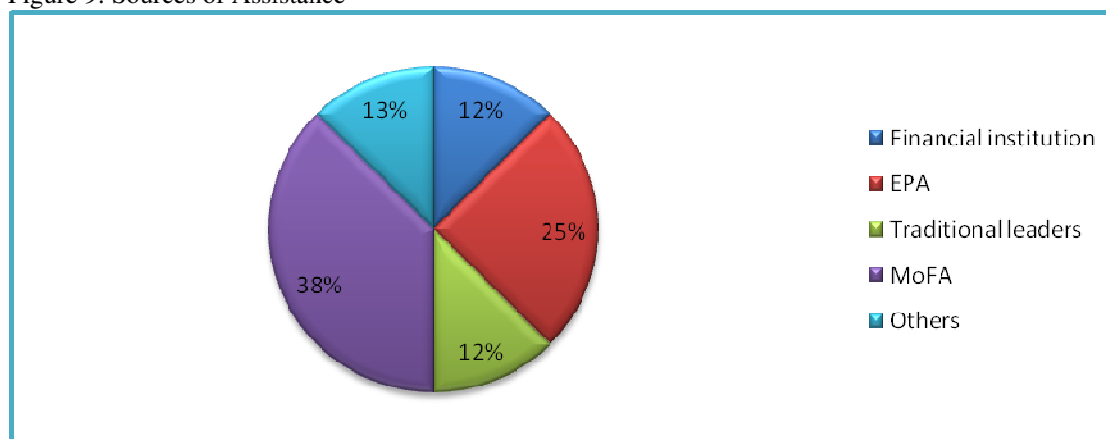
Access to business assistance is very vital in enhancing efficiency of input suppliers to contribute to the chain. Input suppliers in the study areas had access to different types of assistance. The most common form was training (42.86%) followed by advisory services (28.57%). Access to credit (4.29 %) did exist on a limited scale as form of business assistance for input suppliers. These forms of assistance contributed to the growth of their business and service to the chain. To improve their contribution to the chain will mean expanding the coverage of assistance to cover a lot more of input dealers.

Figure 8: Business Assistance to input dealer



From Figure 8 the most common sort of assistance was training. It was therefore not surprising to have released MoFA was the most common source of assistance for input dealers. This is due to the constant interaction between MoFA extension and input suppliers through short term trainings. The Environmental Protection Agency (25%) was the next institution which provided assistance to input suppliers. This was in the form of regulatory services and training. Financial institutions like the rural banks, microfinance institutions and financial NGOs also did provide assistance to input suppliers in terms of short term credit and warehouse.

Figure 9: Sources of Assistance



Using Gross Margin (GM) analysis, it was released input suppliers in the study areas were economically viable. This was due to the fact that they recorded positive margins on all their inputs. However, the rate of margin depended on the type of input with some inputs having higher margins than others. Among the inputs, seed yam was the most profitable enterprise with a margin of GHC 30 per 100 tubers (Table 2). Margins for the sale of agro chemicals were also encouraging with a chemical called nicogan recording GH 5/litre, fertilizer GHC 2.67/bag, among others. Encouraging input suppliers to improve operational efficiency and productivity will increase their margins further and make them more sustainable.

Table 2: Gross Margin for input Supply

Type of input	Unit	Cost Price (GHC)	Selling Price(GHC)	Margin (GHC)
Fertilizer	Bag	52.67	55.33	2.67
Glyphosphate	Litre	9.00	10.00	1.00
Land	Acre		117.50	
Nicogan	Litre	20.00	25.00	5.00
Pesticides	Litre	9.50	10.00	0.50
Sprayer	Number	40.00	45.00	5.00
yam seeds	100 Tubers	150.00	180.00	30.00
Cutlass	Number	10.50	12	1.50
Glifogan	Litre	10.50	13	2.50
Herbicide	Litre	9.33	10	0.67
Hoes	Number	7.00	10	3.00

Source: Field Survey, 2014

#### 4. Conclusion and Recommendations

From this paper, it is clear the role of the input suppliers cannot be ignored in strengthening the yam production system. Developing commercial seed yam production is very important in ensuring farmers have access to clean quality seed yams. This will ensure less disease prevalence and improved yields for increased incomes and livelihoods. Supporting agro input dealers through provision of capacity building programmes and credit will enhance efficiency and service delivery. The end results will be an efficient and disease free seed system that will improve livelihoods and welfare. Governments in developing countries like Ghana must therefore pay attention to policy reforms that will strengthen the role of input supply in the yam value chain. Regulatory authorities must also ensure standards are formulated and maintained to ensure the right agro inputs are provided to the clients.

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#### Acknowledgment

The authors wish to acknowledge financial support from the West Africa Agricultural Productivity Programme (WAAPP) which sponsored the study on functional analysis of the yam value chain study from which this paper was developed. We are also grateful to staff of the CSIR-Crops Research Institute (Socio economics section) for their support in data collection and entry not forgetting MoFA extension officers and yam value chain actors.