Understanding the Current Practices of Cost Accounting Systems in the Libyan Agricultural Firm: Evidence from Six Libyan Agricultural Firms

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Abstract- This paper used qualitative approach to understand the practice of cost accounting systems in the Libyan agricultural firms. Unstructured interview was used to collect data from the interviewees to achieve the research objectives. The study interviewed six employees from different Libyan agricultural firms to understand the current practices of cost accounting systems. The findings indicated that traditional costing is widely used in the Libyan agricultural firms, whereby, full absorption costing is used to calculate the product costs, to allocate overhead costs Libyan agricultural firms rely on volume-based methods such as cultivated area to allocate the indirect costs to products from plantation department, the most used methods to evaluate the inventory in the agricultural firms in Libya is First-in-first out method, the depreciation calculated using Straight-line method. Cost information mainly used for pricing decisions in the Libyan agricultural firms.

Index Terms- Cost accounting systems, agricultural firms, traditional costing, and activity based costing.

I. INTRODUCTION

Agriculture in Libya is an important activity since long time ago, for instance when Garamantes were living in south of Libya, their economy relied most on agricultural activities (Ayoub, 1967). whereas in West of Libya Romans considered the North West of Libya the breadbasket of the Roman Empire (Josh, 2010; Michael, 2009), in the same time Phoenixes were living in the North East of Libya, agriculture was their source of live hood. Most of the Libyan workforce were working in agricultural activities until 1960 (Porter & Yergin, 2006). In 1959 Libyan government discovered oil fields which has had a great impact on the agriculture, this made agricultural sector the second most important sector after oil in Libya (Alsabbag & Alseheri, 1992). Furthermore, the government changed its attention to producing oil. However, agriculture in Libya is still an important sector although its contribution in national income has declined. In 1954 its contribution was 26% (Gandeel, 1978; Helen, 1987). This percentage influenced by discovering oil, the percentage became 5.6% in 1997, and 2.1% in 2007. However agricultural contribution in national income increased to 8.2% in 2009 as a result of the government's orientation towards the diversity of national income sources. As stated by General People's Committee for Agriculture, Livestock and Marine (2009) Libya is subsidizing agricultural firms with billions of dinars, during the last three decades, Libya spent 5.5 billion Dinars on the agricultural sector and the Libyan government has set a five-years plan from 2006 to 2010 which allocated 3.3 billion dinars to support the agricultural sector (General People's Committee for Agriculture, Livestock and Marine, 2009). Although Libyan government is sending billions of dinars on agricultural sectors. Porter and Yergin (2006) argued that Libya agricultural sector are suffering from a low agricultural productivity because a lack of experts in management that lead to inefficient management to scarce resources, moreover making inefficient decision related to investment in technology and irrigation equipments. Moreover, as mentioned by Zentani (2005) one of the constraints that facing barley cultivation is high cost for local production. Therefore, practicing cost accounting systems properly will assist decision makers in the Libyan agricultural firms to make better decision in term of using scarce resources, investment decisions and reduce production costs.

The Libyan government encourages investment in farming in 1993 Libyan government invested 49.88% from its budget in the agricultural investment. Moreover the Libyan government announced law number 5 named "encouragement of investment decision" (Bureau of economic, energy and business affairs, in the year 2009), this law referred to the Libyan government intention to diversify its sources of income including agricultural sector to reduce the import of agricultural products, because Libya imported 75% from food requirements (Porter & Yergin, 2006). To prosper the agricultural firms in North of Libya the government built a massive project called Great Manmade River (GMR) to irrigate many agricultural firms in the North of Libya. This project cost 33.69 billion dollar to transfer water from the south to the north of Libya.

Although the agricultural firms in Libya are covering an area of 3,600,000 acres of arable land (Gandeel, 1978), furthermore, those firms produce in massive production, the agricultural firms do not pay attention to the cost accounting system in decision making processes, cost reduction, and cost control as in other sectors. Juchua, (1986) stated that in large agricultural firm which multi products, the need of management accounting systems for decision making are obviously considerable, this the case in the agricultural firms in the Libyan public sector, they are aiming to produce many products including cereals, fruits, vegetables and animal husbandry. Therefore, managers need information to make many decisions related to their firms. (Abo Al gasm, 2004) argued that although agricultural firms in Libya is large firms and they produce several types of product, they also facing competition from

foreign companies they depend on simple information for decision making (as cited in Aljazawe, 2006). H. Bawa (personal communication, January 1, 2012) ensured that agricultural firms in Libya are facing several accounting problems; therefore we hope accounting researchers conduct more researches in agricultural sector.

In this paper the researcher aims to answer four questions including: do Libyan agricultural firms practice cost accounting systems?, to what extent Libyan agricultural firms use cost accounting system information?, how Libyan agricultural firms allocate indirect cost to their products?, and how Libyan agricultural firms determine their product cost?. The rest of this paper organized as following review of the Literature, research design and data collection, data analysis, research finding and the discussion.

II. THE LITERATURE REVIEW

In this paper review the literature including three parts namely the development of cost accounting systems in the agricultural activities, significance of cost accounting systems in the agricultural sector, and studies related to practice of cost accounting in the agricultural sector.

II.1 The development of cost accounting systems in the agricultural activities

The development of cost accounting systems in the agricultural sector had its origins in the 18th century. According to Juchau (2002), Arthur Young is considered as the first person to pay attention to cost accounting systems for farming in the 18th and 19th centuries. He was unquestionably the most significant writer during the English Agricultural Revolution (Gazley, 1973). Despite farming being considered as the oldest activity for human beings, the development of cost accounting systems in this sector was delayed. According to Ernle (1961), many factors caused this delay before the 18th century. For instance, a lack of capital, markets and communication; also agricultural production was more for domestic consumption.

The 18th century saw technological development in agriculture, such as cultivation techniques, which saw increased agricultural production and use of capital; also improved crop rotation systems. Therefore, farmers needed cost accounting systems information in a timely manner. Arthur Young noted the absence of cost accounting records, which would enable the farmers to determine cost of crops, animals and different modes of farming (Juchau, 2002). However, in the 18th century, the practice of farm book-keeping was at an infancy stage (Juchau, 2002). Young seized the opportunity of absence of cost accounting practices in the agricultural sector to advocate improved farm accounting practices, especially by prescribing records required to support farm management decision making. In particular, Young advocated improved practices in cost management including cost comparisons, cost allocations and product costs which reflected the realities of operating a mixed-farm in the 18th century Britain (Juchau, 2002).

Accounting writers in the 18th century encouraged farmers to keep accounting records to assist the farmers to make better decisions about the performance of livestock and crops, so as to avoid relying on guesswork. For instance, they could know exactly how much money they spent on feeding their herds if they kept regular records; they could also know the costs of every kind of livestock (cattle, sheep, etc.). In mixed farms, it is important to determine the intermediate products costs to enable farmers to undertake cost analysis to determine which crops are profitable. Furthermore, practicing cost accounting systems in mixed farms can assist farmers to allocate overhead costs.

II.2 Significance of cost accounting systems in the agricultural sector

Business organizations need cost information (Ning, 2005), especially large and multi-product farms. (Juchau, 1986) argues that for large agricultural firms that produce several products, management accounting systems for decision making is obviously needed. (Argiles & Slof, 2003; Hannan, 2008; Manalo, 2005; Wijewardena & Zoysa, 1999) stated that firms can benefit from cost accounting systems information in many ways, such as cost management, managerial decision making, product pricing, performance evaluation, budgeting and budgetary control, and preparing of financial statements.(Kaplan & Cooper, 1998) cost accounting systems achieve three goals including, the measurement of the cost of goods sold, valuation of inventory for financial reporting. It provides operators and managers with economic feedback about process efficiency; it determines the cost of activity, services, products, and customers. In brief, the agricultural firms can gain many advantages from the use of costing systems. It helps in making better administrative decisions in several ways, such as allocating overhead costs on cost centers in the fields, especially if a farm plants different types of crops and uses many kinds of machines. Cost accounting opens up new ways of looking at farming operations. It can provide a breakdown of income and expenses by acre and yield units, and enable comparison of performance of different fields, determine why one block maybe producing more than another and analyze optimal use of land. According to Jack and Jones (2007), farmers who practice costing systems will perform better than farmers who do not apply costing systems.

I. 3 Studies related to practice of cost accounting in the agricultural sector

The evaluable accounting literature indicates that there are very few studies on cost accounting systems in the farming sector as argued by several researchers including (Jack & Jones, 2007). Juchua (2002) stated that the writer paid attention to cost accounting systems in farming was Arthur Young in the 18th century, who referred to the significance of cost accounting systems for agricultural activities. However, nowadays there are still accounting researchers who suggest that accounting researchers should pay more attention to cost accounting systems in the agricultural sector (Athanasios, Stergios, & Laskaridou, 2010). Athanasios et al., (2010) stated that the agricultural sector almost neglected from accounting researchers and practitioners, because of the low level of managerial sophistication and lack of economic means in agriculture firms. Practicing cost accounting systems in the agricultural firms has several advantages. According to Luening (1989) and Allen (1994), (as cited in (Argilés & Slof, 2001), implementation of cost accounting systems in agricultural firms can improve farm management and lead to better farm performance.

Tahir et al., (2004) mentioned that cost control in farming operations can increase profits. According to them, farm costing is useful to monitor plantation expenditures that are increasing as farming becomes modernized. To achieve this, cost information ought to be supplied adequately and in a timely manner. (Lee & Kao, 2000) stated in their study, that they applied both the activity based costing (ABC) model and the simulation technique to analyze the operational costs in the Pu Shin wholesale fish market in Taiwan. The ABC system is a system that assigns costs to activities; then assigns these costs to units that consume that activity. Many industries have successfully employed the ABC system to improve operational performance and cost management. Lee and Kao (2000) hoped to use this system in the agricultural firms. They based this on the data obtained from a case study. To apply the ABC system in the wholesale fish market in Taiwan, they utilized four steps. Firstly, they determined the activities. They found six activities in five sections. The sections were the cultured fish (section A), cultured fish (section B), cold storage polyester box (section C), cold storage fish basket (section D) and imported fish (section E). The six activities included unloading, ordering, billing, grading, weighing, numbering, auctioning and administrative operations. Second, was the allocation of resource costs. According to Ostrenga (1990) (as cited in (Lee & Kao, 2000) allocations can be classified into two categories: direct charging and estimation, which means allocating resource costs by using resource drivers and arbitrary allocation. They used direct charging and estimation charging. The third step was the computation of the resource costs. To know the duration of each operation, they installed v8 camcorder. They recorded the time of every operation to determine how much each operation costs. They computed the processing cost of each kilogram of fish. They found using ABC helped managers to determine the product price accurately and this was better than using traditional costing. Jack (2008) argue that although target costing system is not used in agricultural activities, however, target costing is a potential system to be used in the agricultural sector. Jack and Jones (2007) referred the same idea in their study. Jack (2008) explained that farmers use what could be named as an intuitive form of target costing. Farmers depended on previous prices in the prioir year to estimate potential prices to set target costs and then redesign their operations in order to achieve that target. Jack (2008) found that there are some factors that make the practice of target costing in agricultural firms difficult, including the need for detailed cost information and monitoring reports. To achieve this factor, the firms need multidisciplinary teams. However, agricultural firms started to collect data which make target costing probably to be applied in farming, furthermore the logic of target costing as strategic tool fits with the decision making strategy in farming.

Just a few studies are concerned with the study of factors that influence the practice of cost accounting systems in the agricultural firms including Juchau (1986) who mentioned to the significance of practicing cost accounting systems in the agricultural sector to rationalize managerial decision making processes, and assist firms to use the scarce resources in a proper way. Juchau (1986) argue that for a large farm that produces several products, the landlord needs to implement management accounting systems to improve his decision. Many accounting researchers in other sectors (manufacturing and service) ensured Juchau's opinion, such as Al-Omiri and Drury (2007). However, none of the researchers examined the influence of these factors on agricultural firms. According to the contingency theory, there are no ready-made cost accounting systems for all organizations; researchers should determine what cost accounting systems are appropriate for the agricultural firms. Moreover, some researchers stated that legal requirements force firms to implement management accounting systems (Geiger, 1996); also this factor has been tested in manufacturing firms. Therefore, this study adopted these factors to study their affect on implementing cost accounting systems in the Libyan agricultural firms.

In Libya, the government spends billions of Diners on the agricultural firms which belong to the public sector. These firms produce massive products, including plantation and livestock. However, in the past, the agricultural firms in the public sector monopolized the local markets. In other words, all other farms were small farms which could not compete with public firms. Recently, agricultural firms from Italy and the USA are investing in the agricultural firms in Libya. Therefore, in this study, the researcher wanted to know if the agricultural firms' size, cost structure, the level of competition, product diversity, importance of cost information and legal obligation influenced the Libyan agricultural firms to implement cost accounting systems, because according to Aljazawe (2006), the implementation of cost accounting systems in the agricultural firms in Libya are very far from satisfactory.

III. Research Design and Data Collection

This study relied on case study to understand the practice of cost accounting systems in the Libyan agricultural firms. As stated by Scapens (2006) if the researchers want to understand the practice of cost accounting systems, they should conduct deep interviews with the managers and management accountants. Therefore, this study used unstructured interview identify how Libyan agricultural firms practice cost accounting systems, an unstructured interview consisted from four sections including information about the interviewees, information about the firm, information about cost accounting systems, and the perspectives of the interviewees. Six interviews conducted with management accountants, financial accountants, and production manager as in the Table 1 below:

Table 5.41
Interviewees' information

Respondent ID	Current position	An interview date	Duration of an interview
1	Management accountant	9-2-2012	One hour
2	Management accountant	7-3-2012	Two and half hours
3	Production manager	1-2-2012	One and half hour
4	Financial manager	5-2-2012	One and half hour
5	Financial accountant	26 & 27-2-2012	Two hours
6	Financial manager	3-2-2012	One hour

IV. DATA ANALYSIS

Following to collecting the data the researcher followed several steps to analysis the data including that suggested by (Taylor-Powell & Renner, 2003): first organizing the data in tables question by question as in the Table 2, first column includes the interviewees ID, the second column includes question number, the third column includes the response, and the forth column includes the code.

Table 2
Organizing the Data

ID	Q	Response	code
1	1	Manager	position
2	1	Management accountant	position
3	1	Production manager	position
4	1	Financial accountant	position

After the researcher entered all the questionnaires in the table, the second step was organizing the responses for every interviewee separately as shown in Table 3.

Table 3
Organizing the Data for every respondent

ID	Q	Response	code
1	1	Manger	position
2	1	The firm use Activity-based costing	position
3	1	50% direct cost and 50% direct	position
4	1	We use straight-line method	position

Next step was sorting the answers for every question to make understanding the data easier, moreover, to compare between the respondents' answers. For instance, Table 4 will represent all answers for every question together, therefore, the researcher can compare between the cost structures in the four firms.

Table 4
Sorting the Responses

ID	Q	Response	code
1	5	60% direct cost and 40% direct	Cost structure
2	5	30% direct cost and 700% direct	Cost structure
3	5	50% direct cost and 50% direct	Cost structure
4	5	450% direct cost and 55% direct	Cost structure
1	6	The firm is using Full costing	Costing method
2	6	The firm use full costing method	Costing method
3	6	Full costing	Costing method
4	6	Full costing	Costing method

To categorize the data the researcher developed the code for his data as seen in Table 5 below.

Table 5
Code development

Code	Code Description
TP	Type of production
FS	Firm strategy
CASD	Cost accounting system department
DPC	Determining product cost

Finally summarizing the data and writing the report, organizing and sorting the data assisted the researcher in writing the report in term of comparing the interviewees' answers and writing the finding related to the practicing of cost accounting systems in the Libyan agricultural firms.

V. The finding and discussion

The six interviewees stated that they implement cost accounting systems in the Libyan agricultural firms; specifically they use full absorption costing to determine the product cost. In addition, one of the interviewees argue that there are four cost elements in their firms that include labor cost, production requirements, operation and maintenance, and managerial expenses . Besides, interviewees stated that they divided the firms to three cost centres including cost centre for plantation production, cost centre for livestock production and cost centre for general expenses. Furthermore, the documentation collected from the Libyan agricultural firms also indicated that the Libyan agricultural firms practice cost accounting systems because they prepare cost statements.

Most of the interviewees argue that cost information mainly use for setting product prices. While three of the respondents stated that they use cost information in cost control and determine product cost. However, some of them argue that they use cost information in determining the minimum price, make comparison between the year's expenses, and determine the extra activities. Because Libyan government subsidies the agricultural firms, it determines the product prices. Therefore, cost accounting systems in this case used to determine the exact product costs to find the difference between the prices set by the government and the actual costs. If the actual cost less than the prices set by the agricultural ministry, Libyan government will compensate the agricultural firms by the difference between the cost and selling prices.

Although overhead costs should be allocated to all products most of the interviewees stated that they allocate overhead costs to one department namely plantation department ignoring livestock department, the interviewers justified this behavior because plantation department is the main activity in the Libyan agricultural firms. In one of the agricultural firm's expenditure statement in 2011, 88% from the expenditure spent on plantation department and 12% spent on livestock department. Therefore, they use cultivated area to allocate overhead costs to plantation products while livestock products loaded only by direct costs. Moreover, one of the interviewees stated that they use three bases to allocate that include number of workers, field area, and working hours. Although the literature explained that activity based costing is suitable for farming activities all of the respondents stated that they use traditional costing. From the interviewees the Libyan agricultural firms rely on full costing to determine the product cost, they mentioned that there are four cost elements in their firms that include labor cost, production requirements, operation and maintenance, and managerial expenses, this findings supported by the agricultural firms' documents.

This study conducted interviews in six different agricultural firms, however, every agricultural firm produce different products. Therefore, the study suggested that future researchers should conduct a case study to understand the practice of cost accounting systems in every agricultural firm, using deep interviews. A lack of literature related to cost accounting systems in the agricultural firms and the time available for data collection were the most important limitation of this study.

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