

CHALLENGES IN FAIR VALUE MEASUREMENT OF BIOLOGICAL ASSETS IN PLANTATION INDUSTRY AND FARM INDUSTRY

S.M. WEERASEKARA

A.D.N. SAMANI

W.Y. JAYALATH

N.M.K.T. BANDARA

H.D.D.N. PREMATHILAKE

K.H.Y. WEERASINGHE

Y.A.K.P. JAYASEKARA

J.R.I.R. JAYALATH

S.R.A.D. ASHAN

G.G.C.M. GUNARATHNA

ABSTRACT

Background

This study is conducted to find out the challenges of fair value measurement in biological assets of plantation and farm industry. The scope is limiting to the companies which are engaging in the product categories of Tea, Rubber, Coconut, Timber, Parent animals and livestock for consumption purpose. For Agricultural companies LKAS 41 should be followed to recognition and measurement of biological assets and the fair value measurement should be accordance with the provisions given in SLFRS 13. The main object is to find out challenges facing by those companies when measuring biological asset using fair value measurement. When considering Sri Lankan context there are 20 public limited companies which engaging in plantation sector and 2 public limited companies in farm industry are taken to select the sample which consists with 10 Public Limited companies which are represented more than 50% of the total assets and biological assets position from the population.

Methods

Evaluate 10 listed companies out of 22 listed companies in plantation and farm industry in Sri Lanka in order to rationalize our findings from the study towards the challenges facing by those companies in order to ascertain fair value of biological assets. We have selected the

sample based convenient sampling method which represents more than 50% from total assets and biological assets position in those two sectors.

Data will be collected through a questionnaire which was prepared to collect required data with a careful study and rationalization in order to identify real challenges emerge from the study to ascertain fair value of the biological assets of plantation and farm industry.

Discussion and Conclusion

According to the LKAS 41 biological assets shall be measured on initial recognition and at the end of each reporting period at its fair value less cost to sell, except for the event where it is impracticable to measure fair value reliably. In Sri Lankan context plantation and farm entities tend to choose among these two options i.e. either to follow amortized cost method or fair value method. *“Therefore our aim is to find out what are the challenges of fair value measurement in biological assets of plantation and farm industry”.*

1. Introduction

Agriculture is one of the most important sectors in Sri Lankan economy which contributes more than 8% to the annual Gross Domestic Production. The central government of Sri Lanka also focuses much towards this sector while facilitating for the credit needs and providing much more incentives for the investors and lenders in order to enhance the investments. Generally investors tend to make their investment decisions based on the financial performance and the ability to meet short term and long term obligations of the company which are reflected through the financial position of the company.

In Sri Lankan context, LKAS 41 shall be followed to recognize, measurement and disclosure of the biological assets, agricultural produce and government grants related to agricultural industry. According to the recognition and measurement criteria prescribed in paragraph 10 of LKAS 41 of biological assets, ability to reliably measure the fair value or cost is one of the conditions which were stipulated in the reporting standard. After qualifying a biological asset to be recognized there to, according to the provisions given in the paragraphs 12 and 13 of LKAS 41, biological assets initially shall be recognized at fair value less cost to sell except for the case where fair value cannot be measured reliably. The determination of fair value for a biological asset or agricultural produce may be facilitated by grouping them to significant attributes and considering market prices as well as specific valuation techniques. Therefore in fact, there will be challenges to grouping and recognizing them for valuation. In past few years, accounting for agriculture sector shows a dramatically improvement on which it was paid a less attention by the accounting professionals and researchers in the past. Currently this has become one of the most important and interesting area on which many of the researchers are performing their studies.

According to the SLFRS 13 fair value is a market-based measurement. Fair value is defined in SLFRS 13 as ***“The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date”***. However for some assets and liabilities, there will be observable market information and for some might not be available. Objective in the both case is same. I.e. to estimate the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions. A fair value measurement for non-financial asset takes into account a market participant's ability to

generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use. In agricultural industry, entity's shall use valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs. There are three valuation techniques according to the provisions given from the paragraphs 61-66 of SLFRS 13, identified as market approach, cost approach and income approach. For each of these approaches, three levels of inputs are there to facilitate the measurement of fair value. Therefore there will be real challenges to identify those inputs for the valuation models.

Our research question is “what are the challenges to ascertain fair value of biological assets in plantation industry and farm industry”? The overall objective of the study is to identify the challenges faced by the plantation and farm companies in order to ascertain fair value of the biological assets. There is a research gap in the area of using fair value model due to the complexity of measurements as stipulated in above. Therefore the study is to discover the real challenges faced by agricultural companies in measuring biological assets using fair value according to LKAS 41 and SLFRS 13. Further we emphasize on measuring the significance of the challenges which are currently faced by the agricultural companies in Sri Lanka and to evaluate how those challenges impact to the quality of financial statements in terms of accuracy of those measurement values.

Problem and Research Questions

The study is to find out challenges in fair value measurement of biological assets in plantation and farm industry. It was driven through the problem of how they can measure fair value of the biological assets more reliably using three kind of input levels as per the provisions given in SLFRS 13 and how to overcome those fair value measurement challenges if there any.

Objective of the study

- Identify the fair value measurement requirements for the biological asset categories which are subjected for our research according to the provisions of LKAS 41.

- Identify the levels of input for fair value measurements of each selected categories and their disclosure requirements according to the SLFRS 13.
- Obtain knowledge of the industry practices and specific modules of fair value measurement for selected biological asset categories in the plantation companies.
- Identify the challenges to measure the fair value of selected biological asset categories in the selected plantation companies.
- Measure the significance of challenges identified in respective to selected sample companies for fair value measurement of biological assets.
- Provide recommendations to overcome challenges to ascertain fair value of selected companies and proper presentation of financial statements.

Significance of the study

Currently plantation industry and farm industry have some obstacles to measure the fair value of biological assets and it depends on the product category. Modern day emphasize for fair value accounting hold strong post in accounting phenomena. This study proves the importance of updated information against the historical information in order to build a philosophy to reveal that challenges would overcome with clear sight of origination.

Scope and Limitations of the study

This study addresses only the listed companies in Sri Lanka. Due to non-availability of data of private companies the study was limited to listed companies and this could be considered as a limitation of this study.

On the other hand in Sri Lankan context we could able to find poultry farms as only option to research the fair value measurement with respective to livestock breeding for consumption purpose.

The next section reviews the literature.

2. Literature review

Theoretical Background

The study is to identify the challenges in order to ascertain the fair value of biological assets in plantation and farm business. For agricultural companies it is needed to follow LKAS 41

and SLFRS 13. The objective of LKAS 41 is to prescribe the accounting treatment and disclosures related to agricultural activity and it allows companies to use either fair value model or cost model for measuring biological assets. A biological asset at initially and at the end of the each reporting period shall be measured at fair value less cost to sell except for an event where the fair value can't be measured reliably. LKAS 41 assumes that fair value can be measured reliably for most of the biological assets. Fair value measurement is inappropriate for the biological assets which do not have a quoted market price at the time it is initially recognized. In such a case LKAS 41 permitted companies to use cost less accumulated depreciation and impairment losses. Adoption of IFRS resulted in creating problems and challenges on stakeholders though within the global economy almost all the countries needed to convergence with IFRS in order to give a better understanding on financial information to their stakeholders.

Empirical Studies

A study conducted in India highlighted Indian accountants faced a big challenge in adopting IFRS in India. Every accounting professional have to contribute to the convergence process to make it efficiently. The primary problem is that Indian GAAP is recommending using Historical Cost approach, since the convergence they would have to change to the Fair Value approach (Kaur& Kumar 2014).

Fair value measurement became very crucial to financial reporting and it is a hypothetical value which is measured based on current market price. As to the Institute of Chartered Accountants of Sri Lanka fair value is defined, '[t]he price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date'. Fair value is an existing price concept. SLFRS 13 recommends main three valuation techniques for valuing the fair value called market approach, income approach and cost approach.

When measuring fair value of an asset or liability company uses observable market data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities, level 2: inputs other than quoted prices included in level 1 that are observable for the asset or liability either directly (i.e. as prices) or indirectly

(i.e. derived from prices) and level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

Measurement of accounting elements are vital since which are represented in financial statements and stakeholders make their economic decision by looking at those figures. Therefore it is required to do analysis on economic background of the fair value and its strengths and weaknesses. A recent study (Prochazka 2011) concluded that fair value is a measurement way which can represent the true and fair view on elements and from the economic point of view current market based pricing is relevant for decision making. Further fair value measurement is conceptually superior to the other techniques but in practically fair value definition and principles of its usage are critical in arriving true and fair view on financial statements. Elfaki and Hammad (2015, p.159) found that fair value assist to provide useful information to users and there is a positive relationship between application of fair value and relevance and reliability of information for decision making. It is an agreeable point which fair value provides accurate valuation on asset and liability though it is difficult to get active market prices for valuation.

When it comes to the fair value measurement of biological assets, a recent study (Clavano 2014) found that both auditors and accountants believe that, it is a challengeable to use fair valuation for biological assets. Though it is challengeable coconut and banana plantations have proved fair valuation method is already widely applied in Davao region while piggery, poultry and other livestock companies still willing to use historical cost model. The study shows that number of companies use combination of fair value and historical cost. Among the five variables considered as factors that influence the extent in compliance with mandatory IAS 41 disclosures by company, auditor is significant. This ratifies the company auditor plays a major role in preparation of financial statements.

Muhammad and Ghani (2014) shows that most of the companies in Malaysia still using the traditional accounting methods which introduced by Ministry of Public Finance to value the biological assets. In Malaysia most of the companies identified biological assets in current and non-current basis. As far as considering the non-current biological assets, many companies value those using historical cost method and, depreciation, revaluation are also done in same way as other property plant and equipment. Newly born animals which used in production process and to breeding purposes, products of animals which fall in to current

asset category are considering as inventories. Crops which are growing consider as working progress items. So many countries like Malaysia used historical cost method (initially recognized at purchase cost and recognized in balance sheet as minimum of cost or value in use/sale) to value biological assets instead of fair value minus selling cost which represent IAS 41.

Above mentioned situation is totally rejected in South African context. As to the Baigrie and Coetsee (2016, p. 849) most of the public quoted companies use fair value method which represent in IAS 41 for biological asset measuring purposes. Further it shows there are distinct differences of the fair value measurement techniques used by each and every company and also those agricultural companies refuse to show valuation techniques that they are using to value their harvest and livestock.

According to Baigrie and Coetsee (2016, p. 848-849) plantation companies state more disclosures on valuation techniques and recommended disclosures in IAS 41 than companies which holding livestock. These kind of minimum disclosures highly affect to the stakeholders who took decision by analyzing financial statement of an organization. This limitation also applied to the Sri Lankan context. Many Sri Lankan plantation companies also used high technical and more advance formulas to value their harvest and livestock. This leads to low level understandability and quality of financial statements. As to Goncalves and Lopes (2012, p. 19) there are many reasons that firm use other methods to measure value biological assets other than fair value technique. Firm's size, accounting practices, stake holder's perceptions and stock markets that firms are listed are some of them. So it's clear that complexity of fair value techniques is not the only reason for switching to other techniques. Further, firms in developed countries mostly use fair value measurement technique in biological assets than developing countries. And also according to researchers potential growth of a firm has negative impact due to fair value measurement.

Aliberch, Blandon and Bosch (2012, p. 130) stated that most of the accountants use fair value method rather than historical cost method when measuring value of the biological assets. As to them less accuracy of historical cost method and high probability of miscalculation are the main reasons for that. Unavailability of active markets will lead to miscalculation of fair value techniques and this is the main disadvantage of using fair value technique in measuring value of biological assets (Elad&Herbohn 2011, cited in Aliberch, Blandon and Bosch 2012).

Penttinen&Rantala in 2008(cited inAthanasios, Stergios&Laskaridou 2010) shows ‘beyond book-keeping farms require relatively new agriculture management plans’. This will lead to a build a new concept or theory that will help to increase value of biological assets. Argiles, Bladon and Monllau (2005, p. 20) highlights that, fair value method has higher predictive power on future earnings and lower asset volatility. Moreover as to the researchers fair value method decrease complexity of cost calculation in agricultural sector. This is a practical scenario if there is an active markets of every agricultural product otherwise it is impractical method. Further, according to the research fair value method is more constant, reliable and relevant than historical cost method.

Many countries that mainly depend on agriculture still not directly implement fair value method/ IAS 41 to their regulations since, it’s vastly affected to the gross domestic production of that country. As to the Feleaga, Raileanu and Feleaga (2012, p. 37) Romania still is in a questionable position when applying IAS 41 to their current regulations because, majority of agricultural firms are small and medium scale firms. These small and medium scale firms contribute to gross domestic production in a broad way than large firms. If Romania applies IAS 41 to their existing regulations those small and medium firms get confused due to lack of accounting knowledge and insufficient market information.

By refusing all deficiencies, whole world is now implementing IAS 41 to their current accounting regulation systems. Sedlacek 2010 (cited in Loja &Vojackova 2005) state that, ‘[t]hus, using the fair value model leads to presenting of a more real trading income of agricultural enterprises that reflects not only the anticipated losses and risks, but the present market valuation of the produced assets as well’.

When developing accounting practices for agricultural or any other sector, getting ideas from relevant expertise will highly affect to the accuracy of those accounting practices. Most of the researchers who have done their studies relevant to agricultural sector are suggesting this point by their research papers. Kurniawan, Mulawarman and Kamayanthi (2014, p.75) also recommended to get idea from farmers to build accounting practices in Indonesia.

An investigation establish that there is a conflicts between the national Romanian accounting norms and IAS 41 since Romanian agricultural companies reduced the importance of using historical cost model though it is impossible to get market prices to measure the fair value of biological assets since it gives more reliable valuation to the users (Mates et al.2015).

Overall Insight

Fair value is a measurement way which can represent the true and fair view on elements in financial statements and in economic point of view it is more relevant for the purpose of decision making. When it comes to the fair value measurement of biological assets both auditors and accountants believes that it is challengeable to use fair value method. Therefore most of the companies are willing to use historical cost model over fair value.

Existing literature support for the argument of the complexity of fair value is not only reason for switching to the other valuation techniques. The existing literature on accounting for biological assets provides the insight on most of the companies prefer cost model over fair value model and they are trying to move to fair value in order to provide better financial information to users of financial information. Further fair value provides more consistent valuation model and it provides more comparable and reliable information. Within the Sri Lankan context the fact remains as same, still most of the plantation companies prefer to use cost model for valuing the biological assets due to unavailability of active market data. That can't be only the challenge which companies are facing. Therefore the objective of the study is to find out what are the real challenges facing by those companies and its effect to the information provide through company's financial. Further we measure the significant of the challenges which are currently facing by the agricultural companies.

We suggest that researches who are interested in doing their studies on the area on fair value measurement of biological asset they can study on how company can measure biological assets accurately and more consistently.

3. Methodology

Research Approach

In this research the qualitative research approach based on observations, interviews taken from real world is used in order to meet the research objectives.

Population and Sample

The target population for this study is Listed Plantation and Listed Farm companies in Sri Lanka as at 31.03.2017.

The CSE website shows that there are 18 listed plantation companies as at 31.03.2017. Table 1 show the research sample which consists of 9 listed plantation companies and their total asset value as per the audited financials as on 31.03.2016.

The sample was selected on the basis of total asset value which altogether represents 50% of the industry asset value. Irrespective of the asset value we selected Three Acre Farms PLC and Bairaha Farms PLC to the sample which is only listed Farm companies in Sri Lanka.

Table 1: Asset value percentage of selected companies

Company Name	Total Asset Value (LKR '000')	As a percentage of total asset value in Plantation industry
Kotagala Plantations PLC	9,003,197	9.18%
Kahawatte Plantations PLC	4,320,530	4.41%
Balangoda Plantations PLC	5,496,752	5.61%
Agalwatte Plantations PLC	4,263,199	4.35%
Aitken Spence Plantation Managements PLC	5,644,314	5.76%
Kelani Valley Plantations PLC	6,522,375	6.65%
Maskeliya Plantations PLC	4,402,165	4.49%
Udupussallawa Plantations PLC	2,262,133	2.31%
Watawala Plantations PLC	7,731,000	7.88%
Total		50.63%
Three Acre Farms PLC	2,516,151	49%
Bairaha Farms PLC	2,595,685	51%
Total		100%

Source: Colombo Stock Exchange, 2017

Data Collection

The primary source of data collection is the interviews with authorized persons in above mentioned companies. Self-developed questionnaire was used to gather required information. The data collected from the annual reports of sample companies were used as the secondary data to meet our research objectives.

Strategy for Analysis

Research overall objective is to identify the real challenges of fair value measurement of biological assets in plantation and farm industry. We tend to prioritize the challenges that have been identified in the course of interviewing accounting professionals of the respective two industries. In further we would like to emphasize the key highlights given by those professionals with respect to determination of fair value measurement of biological assets. And also key indicators of fair value measurement challenges which highlighted in annual reports and other publicly available articles. Further, future direction of the fair value measurement of biological measurement will be discussed with the newly introduced financial reporting standards.

4. Analysis and Discussion

Fair value measurement enhances relevance of accounting information for the decision makers while compromising reliability of those information. Fair value measurement highly depends on significant assumptions and judgments of the respective professional. Significant judgments and assumptions will lead to earnings management and other negative effects to the key decision making phenomena with intentional or unintentional activities of the management. For the record, that determination of fair value shall be carefully undertaken with clearly defined boundaries with respect to relevant industry characteristics.

Fair value shall be focused in to future economic benefits which have been translated to the present condition and location in order to enhance the decision relevance while should not be compromised the reliability of the information. Therefore challenges of fair value measurement of biological assets in mentioned two industries should be carefully analyzed and discussed with the intention of enhancing the reliability of the fair value measurement.

Initially biological assets shall be measured at fair value cost to sell unless it is impracticable according to the provisions given in the LKAS 41 and fair value shall measure using the guidelines prescribed in the SLFRS 13. According to the SLFRS 13, there are 3 levels of inputs to determine the fair value of specific assets or liabilities. We have identified real challenges in fair value determination with regard to 3 levels of inputs.

Level 1 Inputs

If an active market exists for a biological asset or agricultural produce in its present location and condition, the quoted price in that market is the appropriate basis for determining the fair value of that asset

If the entity has access to different active markets, it should use the quoted price in the most relevant market (i.e. the price in the market which is expected to be used).

According to the discussion that we had with accounting and other professionals, active markets do not exist for the biological assets in current context. There are preconditions to identify a market as an active market, such as price is determined according to the demand and supply law, information relevant for the decision making is publicly available and no cost for the obtaining that information. Set prices are identical as a whole with respect to specific asset and liability category.

Since the agricultural produce and consumable biological assets are valued at market corroborated hypothesis which will reflect the current location and position of the specific asset or liability, active market hypothesis are no longer applicable to ascertain the fair value of biological assets.

Level 2 Inputs

When determining fair value using market-determined prices or values, the entity should use one or more of the following information sources, when available.

- 1) The most recent market transaction price, provided that there has not been a significant change in economic circumstances between the date of that transaction and the end of the reporting period;
- 2) Market prices for similar assets with adjustment to reflect differences; and
- 3) Sector benchmarks such as the value of an orchard expressed per export tray, bushel, or hectare, and the value of cattle expressed per kilogram of meat.

According to the discussion held with accounting and other professional's agricultural produce and consumable biological assets are fair valued using market corroborated inputs and recent transaction prices. Following is the illustration of the agricultural produce and consumable biological assets which can be categorized under the pool of fair value measurement using level 2 inputs.

Bearer Biological Asset	Agricultural produce or consumable biological asset	Products that are resulted after processing the harvest.
Tea trees	Tea leaves	Different categories of processed tea leaves.
Coconut trees	Coconut shell	Coconut oil, coconut milk
Rubber trees	Rubber crop	Crape rubber, rubber sheets
Palm trees	Oil palm crop	Palm oil
Parent birds	Live birds for selling for meat	Processed chicken meat

Source: Author constructed

To determine fair value of the above stated agricultural produce and consumable biological assets as at the year end, entities are following different entity specific market approaches which can be evaluated under the level 2 inputs of fair value measurement in plantation and farm industry.

Followings are the identified and summarized level 2 inputs in order to fair value the agricultural and consumable biological assets of the plantation and farm industry.

- 1) Monthly average selling price. (March)
- 2) Monthly average selling price (For the whole year)
- 3) Annual average selling price.
- 4) Weekly average selling price.
- 5) Subsequent selling prices.
- 6) Most recent transaction price.
- 7) Sector leader's price information.

Therefore entities follow different pricing strategies for level 2 input determinations in order to measure the fair value of biological assets. In our analysis, above pricing approaches can be illustrated with the sample that we have selected for our study as follows.



Source: Author constructed

Value is accompanied by two main variables which are price and the quantity. Therefore accounting professionals have to undertake many challenges to determine fair value of the biological assets, since it highly depends on the significant judgements and assumptions. We would like to disclose challenges in fair value measurement of biological assets using level 2 inputs in the later part of the thesis.

Challenges in fair value measurement of biological assets using level 2 inputs.

If an entity has an access to different active markets, according to LKAS 41 it should use the market price that is most appropriate for it. Most of the companies sell their products to different markets for different prices. Therefore they have emphasized that the consideration of an appropriate market price for a specific agricultural produce or consumable biological asset is challenging. For an example, agricultural products are sold to the supermarkets directly at a different price than a price determined for other whole sale distributors. Therefore selection of a most appropriate price to measure the fair value of the harvested crop as at the year-end is questionable.

Market prices are readily available for the products which have a shorter production cycle such as livestock for meat and determination of market prices for the agricultural produce which have long production cycle is much more challenging since it is highly volatile in different market sectors.

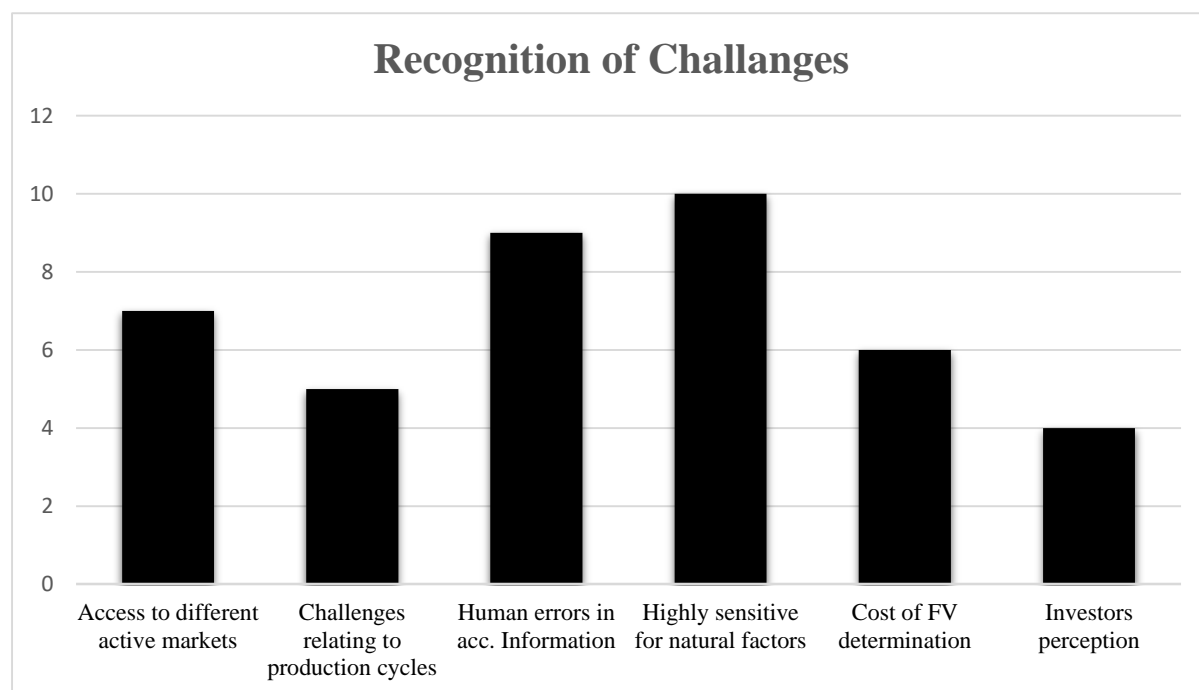
Accounting information might consist of human errors, therefore resource persons believe that obtaining accurate information for the average price calculations or recent market transaction prices are challenging. If not accounting records are updated accordingly, details taken to calculate the market prices are misled.

Livestock and agricultural produce highly sensitive for diseases and natural hygienic factors. Even though price is determined using inputs, best fair value measurement for the livestock and biological assets are challenging.

Most of the companies emphasize the fact that cost of determining of fair value is arguable with the benefits of it. Therefore fair value determination is challenging with controlling the underpinned cost of fair value ascertainment.

Most of the investors tend to believe that historical cost is more decision relevance rather than the fair value. Therefore accounting professional recognized the challenge in set boundaries for disclosing different fair value measurement techniques to lay users.

We would be able to prioritize the challenges identified in above and following graph shows the industry knowledge on above mentioned fair value measurement challenges.



Source: Author constructed

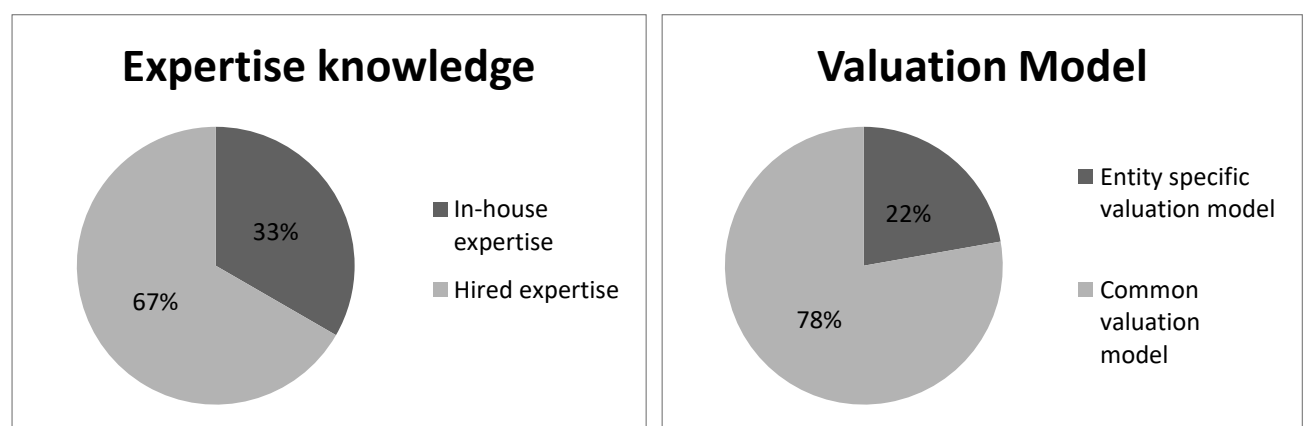
Level 3 inputs are unobservable inputs for the asset or liability. Unobservable inputs shall be used to measure fair value to the extent that relevant observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date. However, the fair value measurement objective remains the same, i.e. an exit price at the measurement date from the perspective of a market participant that holds the asset or owes the liability. Therefore, unobservable inputs shall reflect the assumptions that market participants would use when pricing the asset or liability, including assumptions about risk.

Assumptions about risk include the risk inherent in a particular valuation technique used to measure fair value (such as a pricing model) and the risk inherent in the inputs to the valuation technique. A measurement that does not include an adjustment for risk would not represent a fair value measurement if market participants would include one when pricing the asset or liability. For example, it might be necessary to include a risk adjustment when there is significant measurement uncertainty

An entity shall develop unobservable inputs using the best information available in the circumstances, which might include the entity's own data. In developing unobservable inputs, an entity may begin with its own data, but it shall adjust those data if reasonably available information indicates that other market participants would use different data or there is something particular to the entity that is not available to other market participants. An entity need not undertake exhaustive efforts to obtain information about market participant assumptions. However, an entity shall take into account all information about market participant assumptions that is reasonably available. Unobservable inputs developed in the manner described above are considered market participant assumptions and meet the objective of a fair value measurement.

According to the discussion held with the accounting and other professionals in the plantation and farm industry, we have identified that level 3 inputs are used for the determination of fair value of timber. They use in-house and hired expertise to undertake the measurement of fair value of the timber. Those experts used specific valuation models to determine the fair value which has built based on significant judgments and assumptions.

At the inception of the analysis of the level 3 inputs usage for the determination of the fair value of the biological assets, following is the entity relevant practices for the establishing the confident environment to facilitate the measurement of fair value.



Source: Author constructed

Plantation companies categorized timber as consumable biological assets (Managed trees) and disclose the movement with identical age categories. Most of the entities have a practice of using valuation models to value the managed timber based on a predetermined age

category. “Discounted Cash Flow” technique is used as a common valuation model to measure the fair value of the consumable biological assets of plantation companies. Other category of consumable biological asset of the plantation companies is young plants categorized based on the age of the trees. There is an industry norm of categorizing timber as managed trees which belong to more than 5 years category and young plants which belong to less than 5 years category. Some of the entities used cost techniques to value those young plants due to non-marketable conditions and cost is accumulated with the aim of adjusting it to the fair value gain or loss arise from the managed timber.

“Discounted Cash Flow” valuation model considers present value of net cash flows expected to be generated by the plantation. The cash flow projections include specific estimates for future forecasted period. These estimated expected cash flows are discounted using risk adjusted discount rate. According to the explanations given by the accounting professional, expert knowledge should be obtained in order to measure the fair value of the biological assets. Valuation techniques are used to obtain the best estimate which reflects the present conditions and location of the biological assets. Therefore there will be challenges to measure the fair value of the biological assets using level 3 inputs. In further of our analysis, challenges will be discussed.

of plantation companies. Therefore they tend to hire the expert knowledge from outside of the entity to ensure the high quality of valuation of the biological assets.

Challenges in fair value measurement of biological assets using level 3 inputs.

Utmost priority of the inputs of the common valuation model is given to the forecast the estimated cash flows. According to the explanations given by the experts, future estimated cash flows are embedded to various factors. Experts should consider those factors carefully and consider appropriately when estimating cash flows. Therefore they emphasized that determination of estimated cash flows are challenging.

Those estimated cash flows should be discounted using a risk adjusted discount rate to obtain present value of the estimated cash flows. Selected discount rate should reflect the cost of capital and the market, credit and liquidity risk of the cash flows. Therefore selection of an appropriate current market-determined rate will be challenging.

Growth, i.e. the increase in volume through biological transformation during a given period of time, is essential to the fair value calculation. For any species of tree, growth is dependent upon general climate conditions, soil, silvicultural practice, and quality of genetic material. However, management must perform a series of qualified judgments, assessments and field studies. Without growth rates; it is not possible to apply DCF-modeling based on future growth until harvest. Therefore determination of growth patterns of the trees will be challenging.

Specialist knowledge is required to establish growth rates during one cycle for various species, taking into consideration local conditions. Availability of the well experienced professionals and sophisticated tools are questionable.

Accounting professionals lack the knowledge of these valuation models and that will lead to develop inability to verify the accuracy and appropriateness of the estimated fair value of the biological assets.

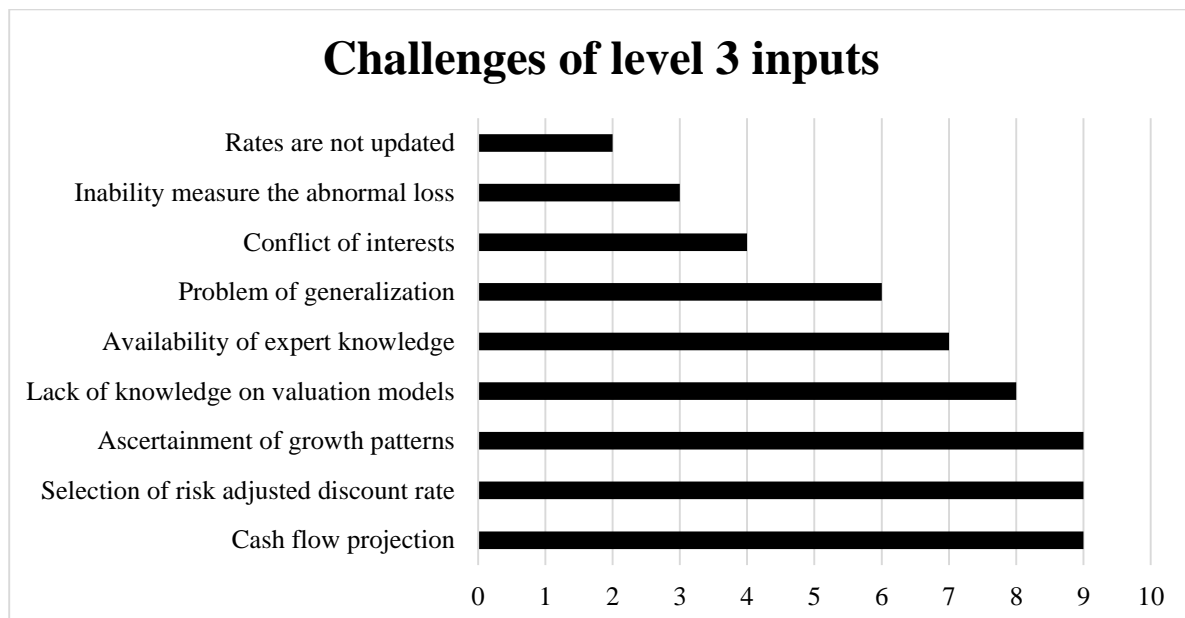
A complete batch is considered to measure the fair value of the managed trees and experts wouldn't able to recognize each and every tree as a viable and marketable tree. Non-marketable and nonviable managed trees might be included for the determined quantity of the selected entire batch of managed trees. Therefore this will be challenging to measure the fair value with a low estimate uncertainty.

Value of a tree can be varied according to its position and current location. If a tree grew in a place where cost of transportation is higher than its market price, there will be no value on that tree. Experts mostly emphasize on this fact and this will be challenging when measures the fair value of thousands of managed trees of a plantation company.

Experts are valuing the managed trees by just looking at the tree from outside and conditions of the tree from the inside cannot be determined due to lack of advancements of the valuation techniques. However they believe that inside condition of the tree shall be impacted to the value of the tree and unavailability of those information leads to weakening the fair value estimation of the managed trees of a plantation company.

Price of cubic feet of a managed tree is declared by the timber corporation and these values are not updated since from 2010. Experts tend to use these rates and it will lead to increase the estimate uncertainty of the fair value of biological assets of a plantation company.

Industry awareness of these challenges and limitations is important to develop alternative measurement techniques and reduce the estimate uncertainty to acceptably low level. Recognition of challenges by the accounting professionals and experts are depicted in below to show the industry awareness of these loop holes. (Selected sample – 9 plantation companies)



Source: Author constructed

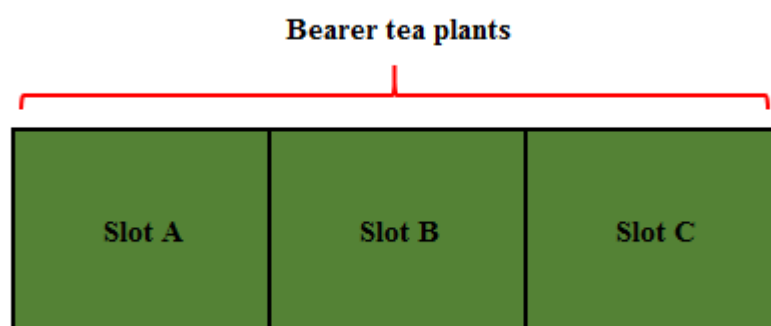
These challenges will be changed due to changes happen in the plantation industry and relevant applicable financial reporting standards. Further, accounting professionals and experts recognized some of the upcoming challenges occurred due to amendments in the ISA 41 which was affected from the 1st January 2016.

Amendments taken place for the paragraph no 44 of LKAS 41, which prescribes provisions for the recognition and measurement of consumable biological assets. New paragraph can be abstracted as follows,

“Consumable biological assets are those that are to be harvested as agricultural produce or sold as biological assets. Examples of consumable biological assets are livestock intended for the production of meat, livestock held for sale, fish in farms, crops such as maize and wheat, produce on a bearer plant and trees being grown for lumber. Bearer biological assets are those other than consumable biological assets; for example, livestock from which milk is produced, and fruit trees from which fruit is harvested. Bearer biological assets are not agricultural produce but, rather, are held to bear produce”.

Industry practice over recognition of crop which will be held to detach from the bearer plant shall be measured at fair value less cost to sell and level 3 inputs are used to measure the fair value according to the discussion held with accounting professionals and experts.

“Crops which are ready to be detached from the bearer tea plant as at the year-end shall be measured a fair value using Discounted Cash Flow method. Expected cash flows from the crop will estimate based on the subsequent sales of that particular crop and even it will be discounted from adjusted risk rate for few days of time”.



Source: Author constructed

For an example, even if all slots are harvested or parts of the three slots are harvested, they are measured at fair value using discounted cash flow technique since those crops are ready to sell as at the year end. Sometimes all the slots might not be harvested before the year end, some slots will be remaining as at the year end and those slots will be harvested subsequent to the year end. Therefore these crops which are ready to be harvested shall be quantified and recognized properly.

New challenges are emerged from this amendment to the plantation industry such as updating of harvested crop information to the head office from all the estates established within the country, obtain a best market price to measure the fair value, determine the market determined risk adjusted discount rate and calculating the abnormal losses at the point of harvesting within a shorter period of time.

5. Conclusion, limitations and recommendations

Conclusion

Accounting practices are prescribed by the financial reporting standards and overwhelmed by generally accepted accounting practices. Positive accounting theories are more likely to influence the determination of fair value of the biological assets and real challenges are emerged with respect to the complexity of the process of ascertaining the fair value of the biological assets.

Ascertainment of fair value is required significant judgments and assumptions. Therefore knowledge of the accounting professionals and experts, market corroborated inputs available for the measurement of fair value, availability of developed valuation models and availability of sophisticated tools are key factors which will be underlined in order to reduce the estimation uncertainty of the measurement of fair value using three levels of inputs.

Most of the accounting professionals come up with the challenges which are oversighted much easily than having a deeper look in to the subject matter. However knowledge of the industry and reporting standards are mainly influenced to the blind of real challenges emerged at the finalization of the study.

Challenges have identified for the level 2 input consideration mainly directed to the selection of best market corroborated inputs, human errors in calculations and volatility of market prices with different types of market segments.

Cash flow projection, selection of risk adjusted discount rates, ascertainment of growth patterns, lack of knowledge of valuation models, availability of expert knowledge, problem

of generalization of estimates to many fields, conflict of interest between accounting professional and experts, inability to measure the abnormal loss and not updating market rates for the timber by local authorities are the identified challenges with respect to using level 3 inputs in order to measure the fair value of plantation companies.

Limitations

As with any research, limitations are inevitable and the limitations of this research are as follows. Firstly, the study was carried out based on the qualitative research approach and findings are highly subjective. Findings wouldn't be able to support by the quantitative analysis.

Secondly, we have selected 9 companies from the plantation industries and 2 companies from the farm industry. There will be a problem of generalization the findings due to non-exposure of further challenges in these two industries with other companies out of the sample.

Accounting practices are highly depending on the provisions given by the reporting standards and most of the challenges emerged due to these provisions even though accounting professionals and experts are well aware about these problems.

Recommendations and future direction

In our study, we have identified the future direction of the fair value measurement of biological assets in plantation and farm industry with following feasible recommendations.

Responsible local authorities shall educate the accounting professionals and experts with respect to develop the knowledge over complex valuation models used to measure the fair value measurement and enable them to develop more concerns over those valuation models with industry experiences.

Rates shall be updated duly with the change of market factors and communicate within the industry by using a fast mode of communication. Local authorities shall develop a floor to the industries to obtain market prices effectively to measure the fair value for the biological assets. This will enhance the uniformity of the fair value measurement within the industry.

Enable the accounting professional of having sufficient knowledge over timber industry, so that they will be able to evaluate the fair value measurement of the expert calculations and line items included in those valuation models. This will help to avoid the conflict of interests between the accounting professionals and experts and avoid estimate uncertainty acceptably to a low level.

REFERENCES

- Aliberch, AS, Blandon, JG & Bosch, JMA 2012, 'A comparative study of difficulties in accounting preparation and judgement in agriculture using fair value and historical cost for biological assets valuation', *Accounting preparation and judgement in agriculture*, vol. 15, no. 1, viewed 31 March 2017, <http://diposit.ub.edu/dspace/bitstream/2445/62988/1/579411.pdf>
- Argiles, JM, Bladon, JG & Monllau, T 2005, 'Fair value versus historic cost valuation for biological assets: Implications for the quality of financial information', *Col·lecció d'Economia*, vol. 9, no. 215, viewed 31 March 2017, http://diposit.ub.edu/dspace/bitstream/2445/34393/1/E09-215_Argiles.pdf
- Athanasios, V, Stergios, A & Laskaridou, EC 2010, 'The Importance of Information through Accounting Practice in Agricultural Sector-European Data Network', *Journal of Social Sciences*, vol. 6, no. 2, viewed 25 March 2017
- Baigrie, I & Coetsee, D 2016, 'An analysis of the financial reporting compliance of South African public agricultural companies', *Journal of Economic and Financial Sciences*, vol. 3, viewed 17 April 2017, <http://www.agriculturejournals.cz/publicFiles/55962.pdf>
- Clavano, MJ 2014, 'Factors that Influence the Valuation of Biological Assets and Compliance with IAS 41/PAS 41 Mandatory Disclosures by Selected Agricultural Companies in Davao Region', *Global Business and Finance Research Conference 5-6 May, 2014, Marriott Hotel, Melbourne, Australia*, viewed 17 April 2017, <https://www.vse.cz/polek/download.php?jnl=pep&pdf=388.pdf>
- Elfaki, AAA & Hammad, SME 2015, 'The Impact of the Application of Fair Value Accounting on the Quality of Accounting Information. An Empirical Study on a Group of Companies Listed on the Khartoum Stock Exchange', *International Journal of Academic Research in Accounting, Finance and Management Sciences*, vol. 5, no.1, viewed 2 March 2017, http://hrmars.com/hrmars_papers/Article_16_The_Impact_of_the_Application_of_Fair_Value_Accounting.pdf
- Feleaga, L, Feleaga, N & Raileanu, V 2012, 'Theoretical considerations about implementation of IAS 41 in Romania', *Theoretical and Applied Economics*, vol. 19, no. 2, viewed 18 April 2017, http://www.ectap.ro/theoretical-considerationsabout-implementation-of-ias-41-in-romania-liliana-feleaga_niculae-feleaga_vasile-raileanu/a686/

Feleaga, L, Feleaga, N & Raileanu, V 2012, 'IAS 41 implementation challenges – The case of Romania', *World Academy of Science, Engineering and Technology*, vol. 63, viewed 26 March 2017, <http://waset.org/publications/2508/ias-41-implementation-challenges-the-case-of-romania>

Goncalves, R & Lopes, P 2012, 'Accounting for Biological Assets: Measurement practices of listed firms', *University of Porto, Faculty of Economics, Rua Roberto Frias, 4200-464 Porto, Portugal*, viewed 4 April 2017

Kamayanthi, A, Kurniawan, R, & Mulawarman, AD 2014, 'Biological assets valuation reconstruction: A critical study of IAS 41 on agricultural accounting in Indonesian farmers', *International Conference on Accounting Studies 2014, ICAS 2014, 18-19 August 2014, Kuala Lumpur, Malaysia*, viewed 17 April 2017, <http://www.sciencedirect.com/science/article/pii/S1877042814058728>

Kaur, G & Kumar, A 2014, 'IFRS and India: Problems and challenges', *Research Directions*, vol. 1, no. 7, viewed 5 March 2017, https://figshare.com/articles/IFRS_AND_INDIA_PROBLEMS_AND_CHALLENGES/915359

Mates, D, Grosu, V, Hlaciuc, E, Bostan, I, Bunget, O, Domil, A, Moraru, M & Artene, A 2015, 'Biological assets and the agricultural products in the context of the implementation of the IAS 41: a case study of the Romanian agro-food system', *Arch. Biol. Sci., Belgrade*, Vol. 67, no. 2, viewed 18 April 2017, <http://www.doiserbia.nb.rs/img/doi/0354-4664/2015/0354-46641400042M.pdf>

Muhammad, K & Ghani, EK 2014, 'A fair value model for bearer biological assets in promoting corporate governance', *Journal of Agricultural Studies*, vol.2. no. 1, viewed on 23 April 2017, <http://www.macrothink.org/journal/index.php/jas/article/viewFile/4630/3799>

Prochazka, D 2011, 'The role of fair value measurement in the recent financial crunch', *PRAGUE ECONOMIC PAPERS*, viewed 4 April 2017, <https://www.vse.cz/polek/download.php?jnl=pep&pdf=388.pdf>

Sedlacek, J 2010, 'The methods of valuation in agricultural accounting', *Faculty of Economics and Administration, Masaryk University, Brno, Czech Republic*, vol. 2, no. 1, viewed 4 April 2017, <http://agriculturejournals.cz/publicFiles/16393.pdf>