AN INSIGHT ON ACCOUNTING FOR AGRICULTURAL TRANSACTIONS: RECENT PERCEPTION OF IAS 41 WITH APPLICATIONS

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Abstract
Agriculture sector has always preserved its significance due to a crucial fulfillment, people's need of food, and providing inputs to several sectors like services, industry or healthcare. Agricultural production's being widely out of suppliers' control is the most important feature of agriculture sector. The reason for that fact can be mentioned as nature's direct effect on agriculture. Besides, agriculture sector should be subsidized by governments by means of technical and financial aspects.
For centuries, agriculture proceeds with constant evolution and advancements. Agriculture businesses have become large scale entities evolving from family businesses through technological progress. Activities pertaining to agriculture constitute a considerable part of nations' economies along with their prominence in international trade. That's why, recognition of agricultural activities is of great importance to accounting. On this basis, IAS Agriculture that is published by International Accounting Standards Board enacted to determine policies regarding to agriculture accounting. This standard is valid today with respective updates.
This paper's motivation is to render guidance for accounting applications associated with agriculture such as biological assets, agricultural produce and government grants within the framework of IAS 41. Thereby, explanatory case studies are developed to generate further assessments about the context. Latest updates about the issues are included in the study as well.

Key words *Accounting for Agriculture, Agricultural Assets, IFRS, IAS 41, TMS 41*

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I. INTRODUCTION

Agriculture sector can be described as economical activities that generate agricultural and animal products and more valuable goods from them by using land and seeds. Rise of industrialization and setting ground for social and economical welfare boost importance for that sector. Previously agricultural produce is considered as an obligatory output that is held for hunger and poverty, however it becomes an input for industry as raw material and it develops into a main determinant for agriculture by sub definitions in food industry, packaging, storage and marketing. Agriculture provide inputs industries like pharmaceuticals, energy and textile apart from food industry.

The sector has great significance on society's health and development by producing various food materials, biologically processing them and accordingly meeting the needs of individuals. Food is an indispensible element of mankind's' sustainable prevalence; societal health and socio-economic development can be enabled with sufficient and balanced nurturing. For sufficient and balanced nurturing of individuals, they should be provided with necessary kind and quantity of food, thus an adequate income to provide those (Doğan and others, 2015). As a consequence of increasing number of multinational corporations and importance of agriculture industry, development of a sector specific accounting system is become inevitable. In this stage, IAS 41 is formed within global reporting system in order to supply companies with reliable information and documents. The adoption of this standard in Turkey is fulfilled by Turkish Accounting Standard 41. Since there is no account group is existent in current uniform accounting plan for biological assets introduced in IAS 41, group 16 is available for use for non current biological assets and group 21 for current biological assets. In this study, accounting applications for biological assets are discussed on IAS 41 basis.

II. SCOPE TO AGRICULTURAL TRANSACTIONS

Considering financial reporting in multinational aspect, agricultural transactions are guided by IAS 41 Agriculture standard. Agriculture standard is valid for financial statement periods beginning from 1st January 2003 and being applied to agricultural accounting processes with latest amendment that is effective after 1st January 2016 periods. IAS 41 concerns all companies involving in agricultural activities. Accounting aspect of these activities can be sorted in 3 categories which are transactions related with biological assets, agricultural produce at the point of harvest and government grants related to biological assets.

As IAS definition agricultural activity "is the management by an entity of the biological transformation and harvest of biological assets for sale or for conversion into agricultural produce, or into additional biological assets" (IAS 41. 5). Some common examples of agricultural activities are specified as raising livestock, fish farming, poultry, stud farms (breeding horse or cattle), forestry, cultivating vineyards, orchards, plantations, floriculture and cropping (PwC, 2009: 3).

To be acknowledged as biological asset by IAS 41, living plant or animals should relate to a managed agricultural activity including a biological transformation. This terms managed and biological transformation refers to processes of growing, degenerating, regenerating, or procreating and that are performed to reach an eventual agricultural produce (Burnside, 2005: 24).

However, agriculture standard can not be applied for products after the point of harvest such as wool, meat, fruit, rubber and logs. For similar products which are modified after harvest point IAS 2 Inventories standard applies. IAS 41 does not apply to unmanaged agricultural activities (such as ocean fishing or deforestation). Also land related to agricultural activities is subjected to IAS 16 Property Plant and Equipment, and intangible assets used for agricultural activities are subjected to IAS 38 Intangible assets. In the following table the biological assets and agricultural produce are illustrated before recent amendment is made.

Table 1: Original Scope of Agriculture Standard

		OUT OF SCOPE
Biological Asset	**Agricultural Produce**	**After Harvest Products (Processed)**
Sheep	Wool	Threads, carpets
Trees from plantation	Logs	Timber
	Sugar cane	Sugar
Milk cows	Milk	Cheese
Shrubs	Leaves	Tea, tobacco
Grape vine	Grapes	Wine
Fruit trees	Reaped fruits	Processed fruits

Source: iasplus.com, IAS 41. 4

According to latest amendment made on agriculture standard which is effective from the beginning of 2016 scope has changed, Bearer plants and government grants relate to them are excluded from the scope of agriculture standard. Bearer plants is formerly accepted as biological assets, they are plants held by the company only for production or supply of agricultural produce and they are unlikely sold as separate agricultural produce. Examples of bearer plants include, grape vines, rubber trees, sugar cane roots and oil palms. These kind of bearer plant and its produce have different accounting treatments. Since a bearer plant is expected to grow produce more than one period it is categorized in non-current assets and treated under IAS 16. To exemplify, when sugar cane is subjected to IAS 41, standard its bearer plant sugar cane roots should be regulated by IAS 16; similarly when latex extracted from rubber trees is subjected to IAS 41, rubber trees should be treated as a bearer plant convenient with recent changes (Deloitte, 2016).

Applied Sample

Discuss accounting treatments of Company G: harvesting grapes and producing wine varieties, and Company M: raising cattle and producing meat for restaurants/markets under IFRS applications.

By way of illustration how biological assets and agricultural produce are differentiated from products resulted through processing after harvest vineyards and cattle farms can be mentioned. In company G vineyard, growing grapevines are living plants that would be categorized as bearer plants according to new amendment and they are evaluated under IAS 16, crops of grapes at the point of harvest are agricultural produce and should be treated under IAS 41 Agriculture standard, however after point of harvest controlled biological transformation is succeeded by a process similar to transformation of raw materials thus products after harvest point such as wine varieties and vinegar should be treated under IAS 2 Inventories standards regulations. Slightly differently in a cattle farm, cattle constitute biological assets when they are alive and nurtured, when they are slaughtered and meat is obtained it become an agricultural produce. These stages are subjected to regulations under

agriculture standard. On the other hand, processed meat products like sausage and salami should be treated as an inventory of this company M.

III. RECOGNITION AND MEASUREMENT

Framework for recognition of biological assets and agricultural production is defined by 3 criteria. In international accounting conception biological assets and agricultural produce are recognized when following conditions are met (IAS, 41. 10):

- **Control:** The asset is controlled by the entity as a result of past events
- **Probable future economic benefits:** It is probable that future economic benefits associated with the asset will flow to the entity
- **Measured cost:** The fair value or cost of the asset can be measured reliably

To explain these criteria, the future benefit is often calculated by ensuring stability of important physical attributes that is available for sustaining production and the control ability is ensured by pointing out legal ownership such as marking in cattle when it's born or bought by the company (Lefter and Roman, 2007: 17).

3.1. FAIR VALUE CONCEPT IN AGRICULTURAL TRANSACTIONS

For establishing basement that will be used for measurement of biological assets and agricultural produce *fair value concept* ought to be reminded. Fair value can be described as market values provided that knowledgeable, willing buyers and sellers willingly existent in a homogenous active market.

Regarding agricultural transactions sometimes entities engage in contracts to sell their biological assets or agricultural produce at a future date. At such instances contract prices do not always reflect fair value, because fair value prices are the current market prices in which a willing buyer and seller would enter into a transaction. Concisely fair value of a biological asset or agricultural produce is not determined by the contract. If an active market for fair value determination is not available, entity can use either of following (IAS, 41. 18):

a) the most recent market transaction price, if there are no significant change noted in economic circumstances between the date of that transaction and the end of the reporting period,
b) market prices for similar assets,
c) sector benchmarks (e.g.: kilogram prices of cattle meat, hectare prices of orchards, bushel prices of cereals).

Measurement of biological assets at initial recognition is stated:

- At fair value prices less estimated point of sale costs (commissions, auctioneer fees) – the standard presumes that fair values can be measured reliably
- At cost values if no reliable measurement for fair values is available

Subsequent transactions of biological assets:

- At fair value prices less estimated point of sale costs
- At cost values less accumulated depreciation and accumulated impairment losses if no reliable measurement for fair values is available

Measurement of agricultural produce harvested from biological assets is stated:

- At fair value prices less costs to sell at harvesting point
- After point of harvest measured by cost at the date, IAS 2 Inventories standard applies relevantly.

At this point it is worthwhile to mention that the general conclusion of the critics found approach of IAS 41 is too academic and not focused on practicalities of reporting of biological assets (Herborn and Herborn, 2006: 180). IAS 41's plan to reflect biological assets at their fair value made inclusion of assets that are subjected to biological transformation a specific issue (Demirkol, 2008: 116). Thus, we aim to put light practicalities via applied samples.

Applied Sample

Company A is an entity engaging in agricultural activities, the entity bought an olive grove including 300 trees at a price of 14.000 €, At the period end fair values of olives obtained from these trees corresponds to 3.000 € total (Örten and others, 2015: 592). How biological assets and agricultural produce are treated under IFRS is shown consequently. Since its future economic benefit is extensive more than one period, categorization of biological assets should be used in non-current assets group. A new account proposal could be made with this respect.

_____ / _____
NON CURRENT AGRICULTURAL ASSETS 14.000
- Olive Trees

CASH 14.000
_____ / _____

Possible gains from matured olives ready to harvest should be included in period profit/loss when it is realized.
_____ / _____
CURRENT AGRICULTURAL ASSETS 3.000
- Matured olives

REVALUATION GAINS FROM BIOLOGICAL ASSETS 3.000
_____ / _____

Accordingly accounts in the balance sheets must be ordered in the following groups

Table 2: Sample Balance Sheet to Biological Asset Accounts

ASSETS	
Current Assets	
BIOLOGICAL ASSETS	3.000
Non-Current Assets	
BIOLOGICAL ASSETS	14.000

3.2. GAINS AND LOSSES ON FAIR VALUE

IFRS use fair value concept as a generic term that can be applied to all assets, liabilities and equity not depending on whether they are quoted or traded on active markets. When quoted prices are absent in active markets IFRS entail the use of possible market information and support widely used and established valuation techniques. This fact points out any rational knowledgeable and willing party would take into account market information in exchanging asset or liability instrument. IAS 41 is one of the main standards this principle is practiced (Cairns, 2006: 9).

At initial recognition, the fair value (less estimated point-of-sale costs) of a biological asset is reported as a gain or loss in income statements. Losses may arise on initial recognition when the estimated point-of-sale costs exceed the fair value of the asset in its current state. The change in fair value of a biological asset between two year end dates is reported as a gain or loss in income statement. For agricultural produce the gain or loss is only available at initial recognition and is included as profit or loss in the period in which it arises (IAS 41. 28).

For the conditions fair value of a biological asset becomes reliably measured, the fair value must be employed to measure biological asset in relevant period. When a non-current biological asset meets the criteria to be classified as held for sale, its presumed fair value could be measured reliably (BDO, 2014).

Applied Sample

Grizzly is a company that holds a forest comprised of 100 maple trees. Trees were planted on 1st January 2010 and for a maple tree it takes 15 years to mature to produce timber which will be used in furniture industry. Fair values can be calculated only for matured trees (15 years old). Weighted average cost of capital for this company is %8. At 31st December 2014 fair value of a maple tree is 4.000 $, and at 31st December 2015 it is 3.800 $ (Riley, 2016).

Under IFRS, fair value of the forest is calculated at both dates as follows:

Because there is no active market and market price for immature trees, fair value would be determined by present value of expected cash flows.

Fair value at the end of 2015 = $\frac{4000}{(1,08)^{10}}$ (10 years to mature) = 1.853 $

Fair value at the end of 2014 = $\frac{4000}{(1,08)^{11}}$ (11 years to mature) = 1.716 $

_____
by 137 $ (gain on growth) ⇧

To analyze the movement in price change between these years:

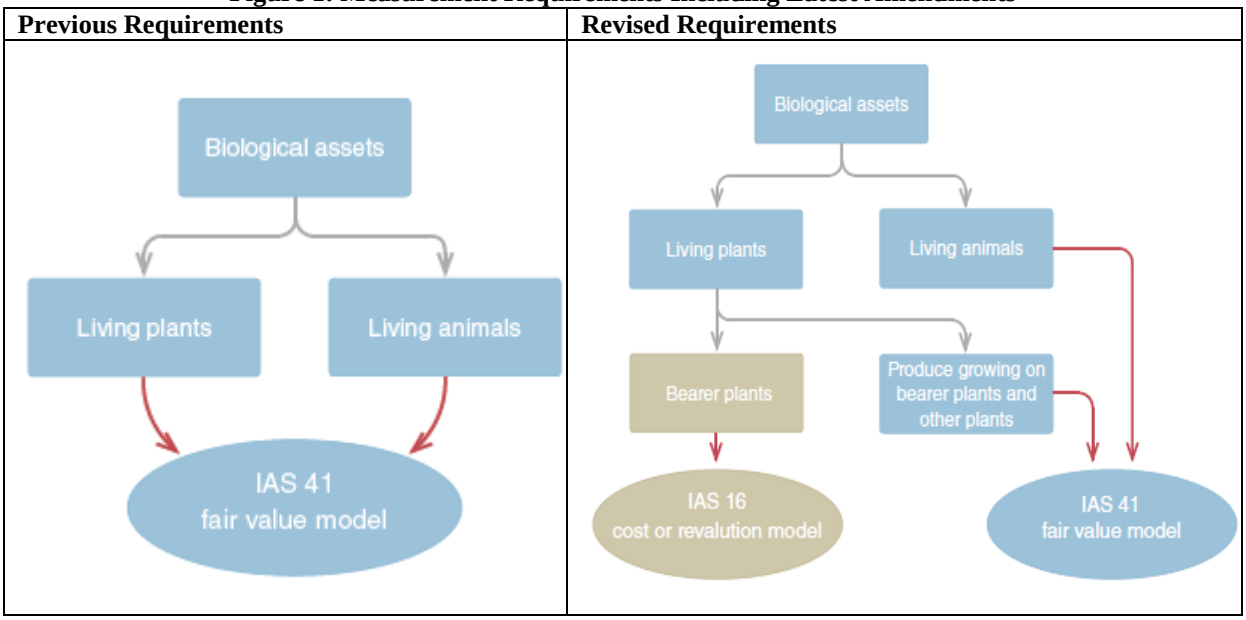
$\frac{4000}{(1,08)^{10}} - \frac{3800}{(1,08)^{10}}$ = by 93 $ (loss on price) ⇩

Also the IAS 41 states that future sales contact prices should be ignored, even if an agreed selling price exists. Any change in the fair value of a biological asset which is generated from price movement or growth movement between two balance sheet dates should be reported in 2015 income statement. (In maple tree example: 137 $ - 93 $ = 44 $ gain to be presented)

It can be deduced that reporting gains and losses on fair value in income statement leads to an increase in volatility about profitability, and a negative effect on predictability about financial statements (Hitz, 2007: 347).

Apart from applied samples, measurement of agricultural assets is illustrated in the following figure to include late amendment made about bearer plants.

Figure 1: Measurement Requirements Including Latest Amendments



Source: ifrs.org

To clarify distinction between bearer plants and others, categorization of "consumable biological assets" and "bearable biological assets" can be introduced. For example, a tree that is logged itself can finally become an agricultural product, however a grapevine bears fruits but not finally become an agricultural produce to be sold separately.

IV. DISCLOSURES AND GOVERNMENT GRANTS

In agriculture entities, for increasing understandability of financial statements eliminating further details would be appropriate. On this basis, details regarding agricultural transactions are disclosed in financial statement footnotes (Tuğay, 2013: 163). IAS 41 in this respect, brings compulsory disclosures to be represented in financial statements. These disclosures include:

- description of the nature of its activities involving each group of biological assets
- non-financial measures or estimates of the physical quantities of each group
- methods and significant assumptions applied in determining the fair value of each group of agricultural produce at the point of harvest and each group of biological assets.
- fair value less costs to sell of agricultural produce harvested during the period, determined at the point of harvest.
- restrictions on title, pledges and commitments in respect of biological assets
- financial risk management strategies related to agricultural activity
- statement of changes in the carrying amount of those biological assets.
- depreciation method used for biological assets and useful lives or depreciation raes used.

While the nature and phases of production of each group of biological asset are described in account format in the disclosure in financial statements, consumable biological assets should be differentiated from bearer assets, with further subdivisions into mature and immature subgroups of each of these. The aim of such disclosures is to provide users of financial statements insight about timing of the future cash flows. The changes in fair value should be represented on the face of income statement, ideally seperated between groups of biological assets (Epstein, 2003).

Analyzing government grants, there are two options available for agricultural activities. The first difference in accounting government grants is about how biological asset is measured (Büyükipekçi and Kağıtçı, 2015: 111). These are classified as unconditional government grants and conditional government grants. An unconditional government grant provided for a biological asset measured at its fair value less costs to sell is recognized as income when the government grant becomes receivable. Conditional government grants including a government grant entails an entity not to engage in a specific agricultural activity are recognized as income when implied conditions are met.

What new revision about bearer plant brings to government grants issue is explained in latest amendment. Previously, IAS 41 requires that government grants that are related to biological assets measured at fair value should be accounted for in profit or loss. With new amendment, bearer plants included within IAS 16 will now be subject to the requirements of IAS 20 Accounting for Government Grants and Disclosure of Government Assistance. Also companies have an option to account for the grant as deferred income or to reduce the grant from the carrying amount of the plant (Deloitte, 2016).

V. CONCLUSIONS

Although agriculture sector's role is irreplaceable in economies, accounting applications in agriculture lacks in complying with changing dynamics in the sector. Due to rapid shift from family businesses to multinational companies agricultural transactions have necessity to be harmonized with current expansion in international trade. Besides this fact, processes of any agricultural produce also lifetime of a biological asset indicate important differences which should be on financial statements in order to provide accurate reliable information.

With IAS 41, international reporting language to fulfill these needs, management of biological transformation and harvesting of biological assets into agricultural produce draw the line of agricultural activity. Probable future economic benefits control and measurable costs are specified as characteristics of recognized agricultural assets. Agriculture standard withdraws historical cost approach taking account of the fact that the income resulting from agricultural activities and biological assets is spread over years. Accordingly brings fair value measurement method which is more convenient with industry-specific dynamics and more appropriate to represent changes resulting from biological transformation processes in financial statements. In agricultural activities, changes in physical attributes of biological assets directly affect agricultural produce and other economics benefits. Implementation of fair value less point-of-sale costs and net realizable value (where no active market is available for fair value detection), information could be delivered from acquisition or planting of a biological asset to harvesting phase.

Recently IAS 41 Agriculture is amended concerning the condition of bearer plants. Since these types of assets are once mature they do not experience any further biological transformation, they will no longer be measured at fair value less costs to sell as standard states. Instead they are subjected to IAS 16 regulations starting from 2016.

IFRS regulations in agriculture field enable users of financial statements to reach information consistent with real market conditions. These regulations give importance to agriculture specific facts including transformation, growth, decay and reproduction. As a result it facilitates to render true and real information to decisions relate to agriculture business.

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