

BIOLOGICAL ASSETS



WORLD BANK GROUP

AABE

Accounting and Audit Board of Ethiopia
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Approaches

No different from other asset classes:

1. Market
2. Income
3. Cost

No specific IVS on Biological Assets and so we have to use the general standards.



The IVS include common valuation principles *and* asset-specific standards

IVS part 1 – General standards

Common valuation principles applicable to all valuations including:

- Scope of work
- Reporting
- Bases of value
- Approaches and methods

IVS part 2 – Asset-specific standards

- Tangible Asset specific
- Intangible/BV Asset specific
- Financial Instrument asset specific

IVS General Standards

The IVS General Standards apply to all valuation specialisms (tangible assets, including personal property, real property and plant and machinery, business valuation and intangible assets and financial instruments)

- IVS 101 Scope of Work
- IVS 102 Investigation and Compliance
- IVS 103 Reporting
- IVS 104 Bases of Value
- IVS 105 Valuation Approaches and Methods

Provides everything the valuer needs to do from the initial instruction to issue of the final report.



IVS General Standards - IVS 104: Bases of Value - Introduction

Compliance with this mandatory standard requires a valuer to select the appropriate basis (or bases) of value and follow all applicable requirements associated with that basis of value, whether those requirements are included as part of this standard (for IVS-defined bases of value) or not (for non-IVS-defined bases of value).

Introduction: Bases of value (sometimes called standards of value) describe the fundamental premises on which the reported values will be based. It is critical that the basis (or bases) of value be appropriate to the terms and purpose of the valuation assignment, as a basis of value may influence or dictate a valuer's selection of methods, inputs and assumptions, and the ultimate opinion of value. A valuer may be required to use bases of value that are defined by statute, regulation, private contract or other document. Such bases have to be interpreted and applied accordingly



IVS General Standards - IVS 104: Bases of Value - IVS Defined and Non Defined Bases of Value

a) IVS-defined bases of value:

- Market Value,
- Market Rent,
- Equitable Value,
- Investment Value/Worth,
- Synergistic Value, and
- Liquidation Value.

b) Other bases of value (non-exhaustive list):

- Fair Value (IFRS),
- Fair Market Value (Organisation for Economic Co-Operation and Development),
- Fair Market Value (United States Internal Revenue Service), and
- Fair Value (Legal/Statutory). (Model Business Corporation Act, and Canadian Case Law)



IVS General Standards - IVS 104: Bases of Value - Allocation of Value

220. Allocation of Value

220.1. Allocation of value is the separate apportionment of value of an asset(s) on an individual or component basis.

220.2. When apportioning value, the allocation method must be consistent with the overall valuation premise/basis and the valuer must:

- follow any applicable legal or regulatory requirements,
- Set out a clear and accurate description of the purpose and intended use of the allocation,
- consider the facts and circumstances, such as the relevant characteristic(s) of the items(s) being apportioned,
- adopt appropriate methodology(ies) in the circumstances.



IVS General Standards - IVS 105: Valuation Approaches and Methods - Key Concept

Key Concept; Valuers are not required to use more than one method for the valuation of an asset, particularly when the valuer has a high degree of confidence in the accuracy and reliability of a single method given the facts and circumstances of the valuation engagement. However, valuers should consider the use of multiple approaches and methods and more than one valuation approach or method may be used to arrive at an indication of value, particularly when there are insufficient factual or observable inputs for a single method to produce a reliable conclusion.

Where more than one approach and method is used, or even multiple methods within a single approach, the conclusion of value based on those multiple approaches and/or methods should be reasonable and the process of analysing and reconciling the differing values into a single conclusion, without averaging, should be described by the valuer in the report.



IVS General Standards - IVS 105: Valuation Approaches and Methods Introduction

10. Introduction

10.1. Consideration must be given to the relevant and appropriate valuation approaches. One or more valuation approaches may be used in order to arrive at the value in accordance with the basis of value. The three approaches described and defined below are the main approaches used in valuation. They are all based on the economic principles of price equilibrium, anticipation of benefits or substitution.

The principal valuation approaches are:

- market approach,
- income approach, and
- cost approach.





Approach to Fair Valuing Biological Assets

It is important to highlight that the appraiser engineer, together with the company's controller-ship, shall analyze each case and its specificities to define the best approach for the biological asset. Due to the nature of agricultural operation associated to this asset, it is recommended to consult an Agronomic Engineer, mainly in relation to the technical assumptions: productivity, cultural treatments, etc.

Example for methodological definition





Income Approach – Sugarcane – Example Stylised

Assumptions

Assumptions: General, revenue, CACs, discount rate and taxes with the respective units and description – sugarcane

General		
▶ LOB	ha	Area planted on the base date by cut
▶ Production cycle	cutting	Number of cuts explored
▶ Forecast period		The projection of the biological asset is one crop
Income		
▶ Productivity	t/ha	Productivity by cut
▶ ATR	kg/t	Total recoverable sugar
▶ Price	Birr/kg	Price (please indicate source)
Operating costs		
▶ Cultural treatments	Birr/ha	Costs to be incurred from cultural practices in the current crop
▶ CCT	Birr/t	Cut, harvest and shipping cost
CACs (Contributory Asset Charge)		
▶ Land CAC	Birr/ha	Hypothetical land lease applied to the planted area
▶ Partnership/lease cost	t/ha	Partnership/lease cost, usually defined in a productivity-based contract
▶ Contractual total recoverable sugar	kg/t	ART suggested for partnership contracts
▶ Price	Birr/kg	TRS Price
▶ CAC of bearer plant	Birr/ha	Hypothetical lease of the bearer plant
▶ Depreciation	Birr/ha	Corresponding to the sugar cane that will be harvested in the projection
▶ Spread	%	Market rate
Discount rate		
▶ Discount rate	%	Discount rate to bring the projection to present value (e.g., WACC)
Taxes		
▶ Taxes	%	Tax rate for Agribusiness



Income Approach – Sugarcane – Example Stylised

Period					2018	2019
Revenue projection					2018	2019
Planted area			Total			
1st cut 18 months	ha		2.000		-	2.000
1st cut 12 months	ha		3.000		3.000	-
2nd cut	ha		5.000		5.000	-
3rd cut	ha		4.500		4.500	-
4th cut	ha		5.000		5.000	-
5th cut	ha		5.500		5.500	-
Total		ha	25,000		23,000	2,000
Productivity						
1st cut 18 months	t/ha		120		-	120
1st cut 12 months	t/ha		100		100	-
2nd cut	t/ha		90		90	-
3rd cut	t/ha		80		80	-
4th cut	t/ha		70		70	-
5th cut	t/ha		60		60	-
Average		t/ha	81		78	120
Volume			Total			
1st cut 18 months	t		240.000		-	240.000
1st cut 12 months	t		300.000		300.000	-
2nd cut	t		450.000		450.000	-
3rd cut	t		360.000		360.000	-
4th cut	t		350.000		350.000	-
5th cut	t		330.000		330.000	-
Total		t	2,030,000		1,790,000	240,000



Income Approach – Sugarcane – Example Stylised

Price				
ATR	kg/t		135	135
TRS Price	Birr/kg		0.6161	0.6161
Total	Birr/t		83.17	83.17
Gross income	Birr '000		148.881	19.962
Taxes		2.05%	(3.052)	(409)
Net revenue	Birr'000		145.829	19.552



Income Approach – Sugarcane – Example Stylised

Costs					
Cut, harvest and shipping cost					
CCT	Birr/t		30		30
Total	Birr'000			53.700	7.200
Treatment cost					
Treatment of ratoon cane	Birr/ha		1.800		1.800
Treatment area	ha		2.000		-
Total	Birr'000			3.600	-
CAC's (Contributory Asset Charges)					
Land CAC					
Contracted productivity	t/ha	✓	12.0	✓	12.0
TRS for contracts	kg/t	✓	121.97	✓	121.97
TRS Price	Birr/kg	✓	0.5901	✓	0.5901
Land cost	Birr/ha		864	✓	863.69
Remaining area	ha				25.000
Total	Birr'000			21.592	1.727
				Total	78.892
					8.927



Income Approach – Sugarcane – Example Stylised

Cost of Planting, Maintaining the Bearer Plants

2018 Birr/hectre	630	25,000 hectares	Total cost – Birr 15,754
2019 Birr/hectre	876	2,000 hectares	Total cost – Birr 1,752



Income Approach – Sugarcane – Example Stylised

DCF			
Net revenue		145.829	19.552
Land Costs and CAC		(78.892)	(8.927)
EBT		66.936	10.625
Inc. tax & Soc. contr.	34%	(22.758)	(3.613)
Net income		44.178	7.013
CAC Bearer Plant (post tax)		(15.754)	(1.752)
Free cash flow		28.424	5.261



Income Approach – Sugarcane – Example Stylised

			2018	2019
Discounted cash flows			27.478	4.916
Period of Discounting			9mths	18 mths
Discounting Rate	WACC		7%	
Total Fair Value	32.394			



Income Approach – Sugarcane – Example Stylised

Can I use this FV for my IFRS financial reporting purposes?

Yes

But I need to deduct my estimate of **costs to sell**.



Income Approach – Fruit – Example Stylised

ASSUMPTION	UNIT	DESCRIPTION
General		
▶ LOB	ha	Area planted on base date by farm/field
OR		
▶ Trees	# trees	Number of productive trees existing on the base date, per farm/field
▶ Forecast period		The projection of the biological asset is one crop
Income		
▶ Productivity	box/ha or box/tree	Productivity per farm/field
▶ Price	Birr/box	Price
Operational and harvesting costs		
▶ Production/Harvest/ Handling/Transportation	Birr/box	Costs to be incurred for cultural treatments and costs for harvesting and transportation
CACs (Contributory Asset Charge)		
▶ Land CAC	Birr/ha or % revenue	Hypothetical land lease applied to the planted area or to the total revenue from that area
▶ CAC of bearer plant	Birr/ha or Birr/tree	Hypothetical lease of the bearer plant
▶ Installation cost	Birr/ha or Birr/tree	Implementation cost
▶ Rate (bearer plant)	%	Discount Rate WACC
▶ Useful live rate of the trees	%	Depreciation rate according to the useful life of the trees
Discount rate		
▶ WACC	%	WACC post tax
Taxes		
Taxes	%	Tax rate for Agribusiness



Income Approach – Fruit – Example Stylised

Revenue projection			2018
Production area	ha		13.0
Quantity of trees	# trees		1.000
Field I	# trees		1.500
Field II	# trees		1.000
Field III	# trees		1.500
Field IV	# trees		1.500
Total	Quantity of trees		5.000
Productivity	boxes/tree		3.0
Field I	boxes/tree		2.1
Field II	boxes/tree		2.5
Field III	boxes/tree		2.1
Field IV	boxes/tree		2.1
Average	fruit boxes by tree		2.4
Volume	boxes		3.000
Field I	boxes		3.150
Field II	boxes		2.500
Field III	boxes		3.150
Field IV	boxes		3.150
Total	boxes		11.800
Final Price			30.00
	Birr/box		



Income Approach – Fruit – Example Stylised

Gross income	Birr'000		354
Tax		2.85%	(10)
Net revenue	Birr'000		344



Income Approach – Fruit – Example Stylised

Costs				
Production and harvest cost				
Production costs	Birr/box		▼	7.00
Harvest costs (picking)	Birr/box		▼	5.00
Handling costs	Birr/box		▼	2.00
Total	Birr'000		▼	165
Cost of transportation/freight				
Transport	Birr/box		▼	2.00
Total	Birr'000		▼	24
CAC's (Contributory Asset Charges)				
Land CAC				
Cost of land in the region	Birr/ha		▼	20,000.00
Lease rate in the region	%		▼	4.0%
Land CAC	Birr/ha		▼	800.00
Total	Birr'000		▼	10.4



Income Approach – Fruit – Example Stylised

CAC of the bearer plant (post tax)		
Planting cost	Birr/tree	300
Useful life	years	20
Depreciation	Birr/tree/year	15
Tax Rate	%	34%
CAC Bearer Plant	Birr/tree	10
Total number of trees	trees	5,000
Total	Birr'000	50



Income Approach – Fruit – Example Stylised

DCF			
Net revenue			344
Land Costs and CAC			(199)
EBT			145
Taxes		34%	(49)
Net income			96
CAC Bearer Plant (post tax)			50
Free cash flow			46
Discount Rate (WACC)		10.0%	
Months			
Part time			
Discount factor			0.95
Discounted cash flows			44



Income Approach – Tax Amortisation Benefit or Tax Shield

Tax Amortisation Benefit (TAB) or Tax Shield is an element of the fair value of all assets that are deductible for tax purposes. Added to the amount after taxes, it is an amortisation/depreciation benefit that reflects the additional value of an asset as a result of its ability to deduct the amortisation of the asset over its tax life. The benefit is essentially the present value of the tax savings resulting from the asset amortisation / depreciation.