Technical Presentation:

Natural Capital Account for Water- Zambia

September 2019 [Netherlands Study Tour Presentation]

WAVES

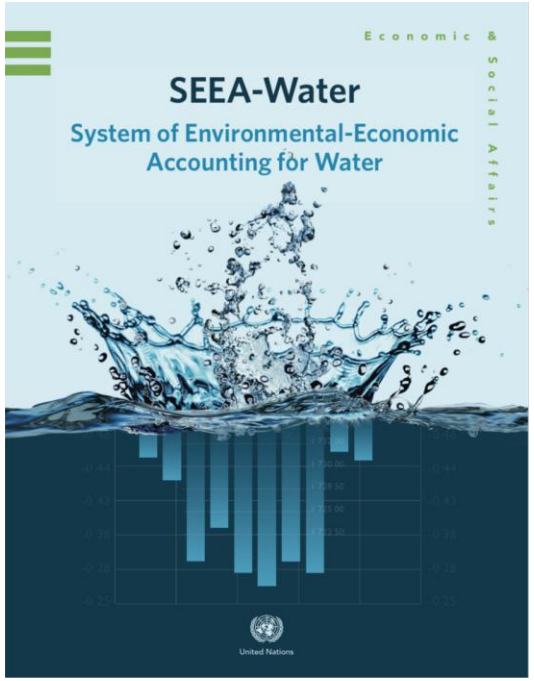
Wealth Accounting and the Valuation of Ecosystem Services **www.wavespartnership.org**

WORLD BANK GROUP

OUTLINE OF PRESENTATION

- ❑ INTRODUCTION
- ❑ ACHIEVEMENTS TO DATE
- ❑ OVERVIEW OF MAIN FINDINGS
- ❑ TECHNICAL CHALLENGES ENCOUNTERED
- ❑ NEXT STEPS
- ❑ RECOMMENDATIONS

INTRODUCTION



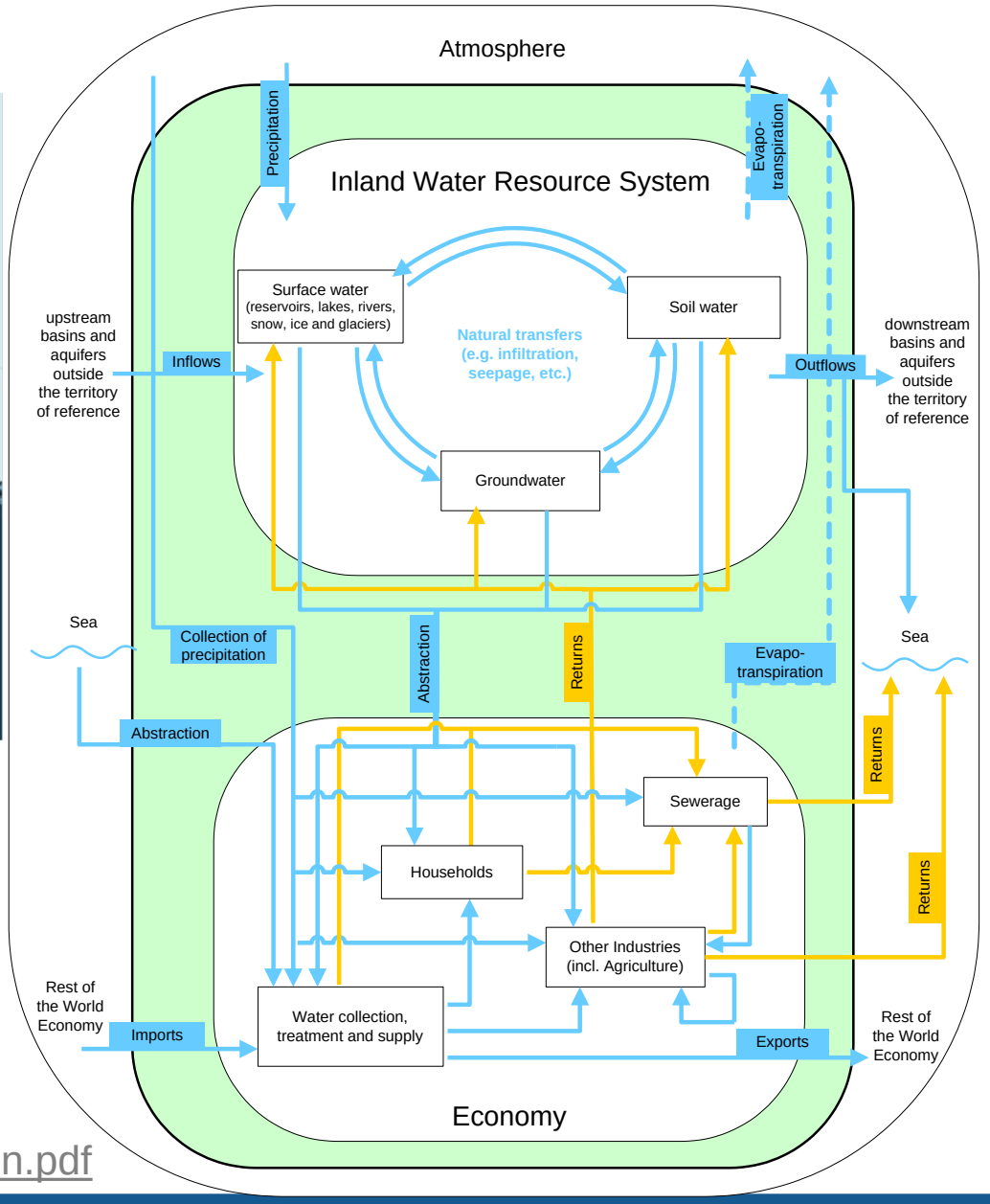
Main concepts

- Stocks and flows
- Economy and environment
- Volume and values
- Water quality

Major Objectives

- Understanding the interactions between water resources and the environment;
- Aid in water resources planning within the context of national development; and
- Understanding the contribution of water resources to economic development.

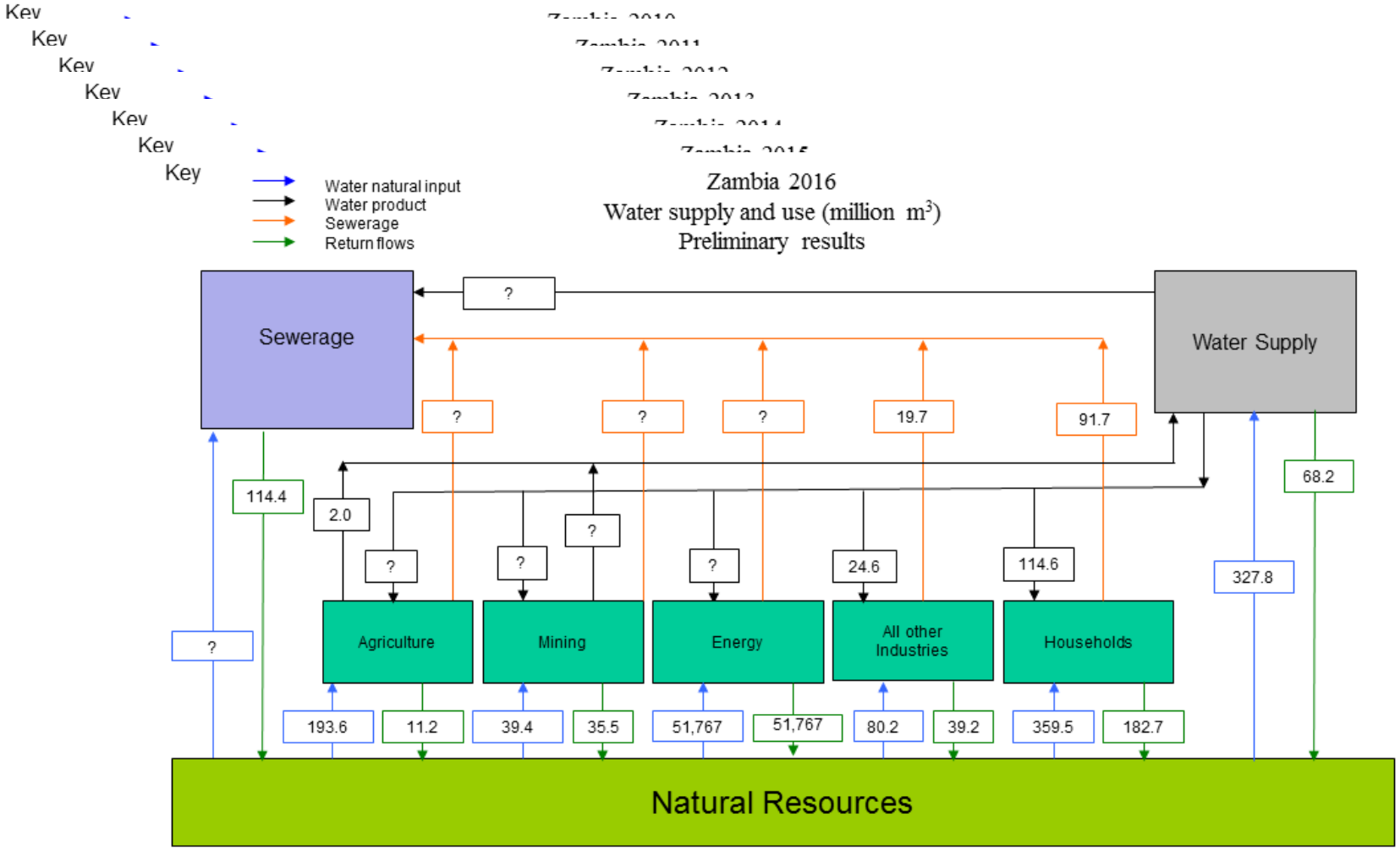
https://unstats.un.org/unsd/envaccounting/seeaw/seeawaterwebversion.pdf



ACHIEVEMENTS TO DATE

- Implementation of SEEA-Water in Zambia has focused mainly on Stocks and flows, and interactions between the economy and environment;
- For the period 2010 – 2016;
- For the review period PSUTs and MSUTs have been developed.
- Draft Water Account technical report covering the period 2010 - 2016

INTRODUCTION: Physical Flow Diagrams



INTRODUCTION: Physical Supply & use tables

Table 1. Preliminary water physical supply and use tables for Zambia, 2010 (Mm3)

Table 2. Preliminary water physical supply and use tables for Zambia, 2011 (Mm3)

Table 3. Preliminary water physical supply and use tables for Zambia, 2012 (Mm3)

Table 4. Preliminary water physical supply and use tables for Zambia, 2013 (Mm3)

Table 5. Preliminary water physical supply and use tables for Zambia, 2014 (Mm3)

Table 6. Preliminary water physical supply and use tables for Zambia, 2015 (Mm3)

Table 7. Preliminary water physical supply and use tables for Zambia, 2016 (Mm3)

Physical supply table, 2016		Agriculture						Industry						Households	Environment	TOTAL
		Agriculture (large-scale irrigation)	Agriculture (small holder irrigation)	Agriculture (livestock)	Subtotal agriculture	Mining	Energy	Water utilities	Irrigation schemes	Subtotal water supply industry	Sewerage	All other industries	Subtotal industry			
Natural resources																
	Surface water														52,152.1	52,152.1
	Groundwater														615.4	615.4
	Rainwater tanks															0.0
	Total natural resources														52,767.5	52,767.5
Products																
	Natural water		2.0		2.0			207.4		207.4			209.4	-		209.4
	Sewerage											19.7	19.7	91.7		111.4
	Total water and sewerage products		**2.0**		**2.0**			**207.4**	-	**207.4**	-	**19.7**	**229.1**	**91.7**		**320.8**
Return flows																
	To surface water	11.2			11.2	35.5	51,767.0				111.4		51,925.1			51,925.1
	To groundwater*							68.2		68.2		39.2	107.4	187.2		294.6
	Total return flows	**11.2**	-	-	**11.2**	**35.5**	**51,767.0**	**68.2**		**68.2**	**111.4**	**39.2**	**52,032.5**	**187.2**		**52,219.7**
TOTAL SUPPLY		11.2	2.0		13.2	35.5	51,767.0	275.6	-	275.6	111.4	58.9	52,261.6	278.9	52,767.5	105,308.0

Physical use table, 2016		Agriculture						Industry						Households	Environment	TOTAL
		Agriculture (large-scale irrigation)	Agriculture (small holder irrigation)	Agriculture (livestock)	Subtotal agriculture	Mining	Energy	Water utilities	Irrigation schemes	Subtotal water supply industry	Sewerage	All other industries	Subtotal industry			
Natural resources																
	Surface water	37.3		156.3	193.6		51,767.0	148.5		148.5			52,109.1	43.0		52,152.1
	Groundwater					39.4		179.3		179.3	-	80.2	298.9	316.5		615.4
	Rainwater tanks				-			-			-	-	-			-
	Total natural resources	**37.3**	-	**156.3**	**193.6**	**39.4**	**51,767.0**	**327.8**	-	**327.8**	-	**80.2**	**52,408.0**	**359.5**		**52,767.5**
Products																
	Natural water		-		-			70.2				24.6	94.8	114.6		209.4
	Sewerage				-						111.4		111.4	-		111.4
	Total water and sewerage products		-		-			70.2			111.4	24.6	206.2	114.6		320.8
Return flows																
	To surface water														51,925.1	51,925.1
	To groundwater*														294.6	294.6
	Total return flows														**52,219.7**	**52,219.7**
TOTAL USE		37.3	-	156.3	193.6	39.4	51,767.0	398.0	-	327.8	111.4	104.8	52,614.2	474.1	52,219.7	105,308.0

*Losses in distribution plus unaccounted for water (e.g. from leaky pipes)

INTRODUCTION: Monetary Supply & use tables

Table 1. Preliminary water monetary supply and use tables for Zambia, 2010(ZMW 'Million')

Table 2. Preliminary water Monetary supply and use tables for Zambia, 2011 (ZMW 'Million')

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Table 6. Preliminary water Monetary supply and use tables for Zambia, 2015 (ZMW 'Million')

Table 7. Preliminary water Monetary supply and use tables for Zambia, 2016 (ZMW 'Million')

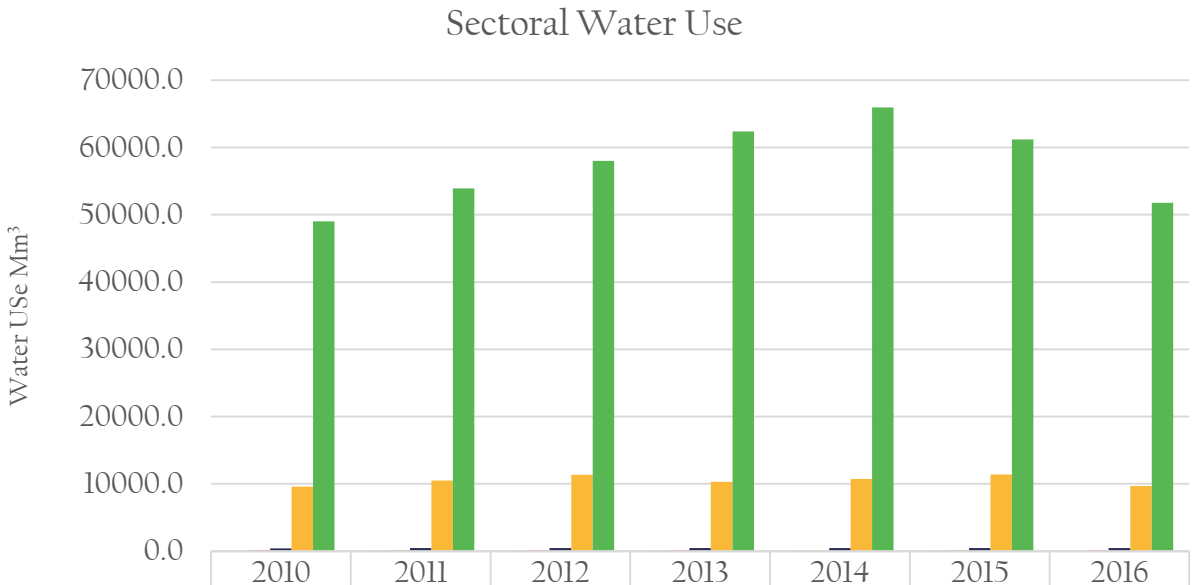
Monetary supply table, 2016	Agriculture				Industry								Households	Environment	TOTAL
	Agriculture (large-scale irrigation)	Agriculture (small holder irrigation)	Agriculture (livestock)	Subtotal agriculture	Mining	Energy	Water utilities	Irrigation schemes	Subtotal water supply industry	Sewerage	All other industries	Subtotal industry			
Natural resources															
Surface water														28,683.7	28,683.7
Groundwater														374.6	374.6
Rainwater tanks															0.0
Total natural resources														29,058.2	29,058.2
Products															
Natural water		1.1		1.1			421.6		421.6			422.7	-		422.7
Sewerage											26.8	26.8	70.1		96.8
Total water and sewerage products		1.1		1.1			421.6	-	421.6	-	26.8	449.4	70.1		519.5
Return flows															
To surface water	6.2			6.2	19.5	28,471.9				61.3		28,558.8			28,558.8
To groundwater*							37.5		37.5		21.6	59.1	93.6		152.67
Total return flows	6.2	-	-	6.2	19.5	28,471.9	37.5		37.5	61.3	21.6	28,617.9	93.6		28,711.5
TOTAL SUPPLY	6.2	1.1		7.3	19.5	28,471.9	459.1	-	459.1	61.3	48.3	29,067.3	163.7	29,058.2	58,289.2

Monetary use table, 2016	Agriculture				Industry								Households	Environment	TOTAL
	Agriculture (large-scale irrigation)	Agriculture (small holder irrigation)	Agriculture (livestock)	Subtotal agriculture	Mining	Energy	Water utilities	Irrigation schemes	Subtotal water supply industry	Sewerage	All other industries	Subtotal industry			
Natural resources															
Surface water	20.5		86.0	106.5		28,471.9	81.7		81.7			28,660.0	23.7		28,683.7
Groundwater					21.7		98.6		98.6	-	80.2	200.5	174.1		374.6
Rainwater tanks				-			-			-	-	-	-		-
Total natural resources	20.5	-	86.0	106.5	21.7	28,471.9	180.3	-	180.3	-	80.2	28,860.5	197.7		29,058.2
Products															
Natural water		-		-			38.6				86.1	124.7	298.0		422.7
Sewerage				-						96.8		96.8	-		96.8
Total water and sewerage products		-		-			38.6			96.8	86.1	221.6	298.0		519.5
Return flows															
To surface water														28,558.8	28,558.8
To groundwater*														152.7	152.7
Total return flows														28,711.5	28,711.5
TOTAL USE	20.5	-	86.0	106.5	21.7	28,471.9	218.9	-	180.3	96.8	166.3	29,082.0	495.7	28,711.5	58,289.2

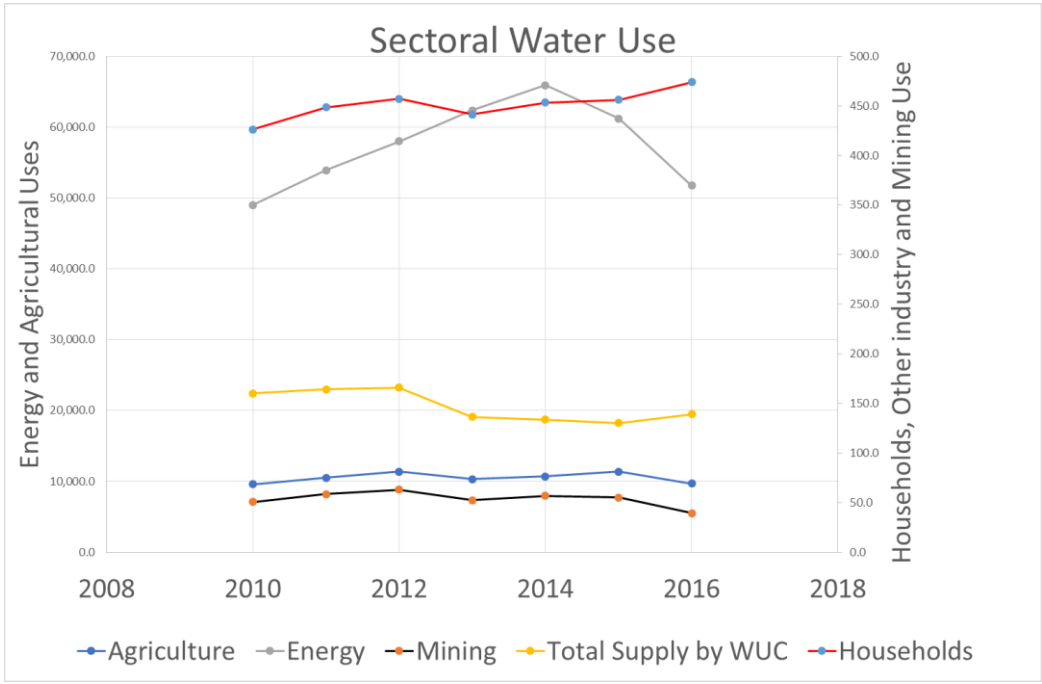
*Losses in distribution plus unaccounted for water (e.g. from leaky pipes)

MAIN FINDINGS

❑ Sectoral Water Use

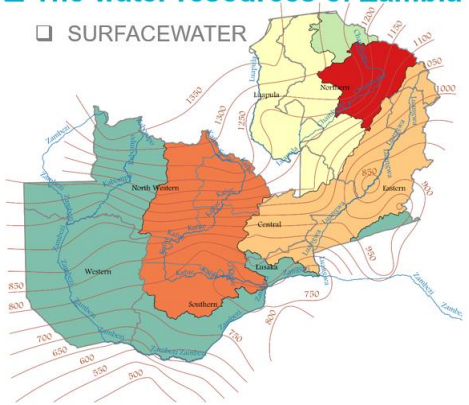


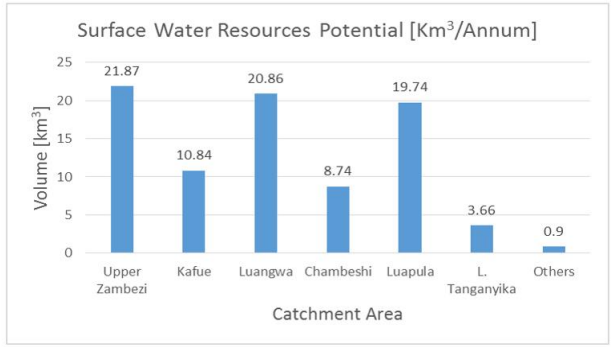
	2010	2011	2012	2013	2014	2015	2016
Mining	50.5	58.7	63.1	52.5	57.0	55.0	39.4
Industry	156.4	110.3	118.2	111.7	91.4	108.3	101.7
Households	426.3	448.6	457.0	441.4	453.2	456.1	474.1
Agriculture	9611.5	10481.2	11359.5	10320.0	10711.1	11372.8	9703.5
Energy	49007.0	53924.0	57999.0	62371.0	65944.0	61215.0	51767.0



❑ **The water resources of Zambia**

❑ SURFACEWATER

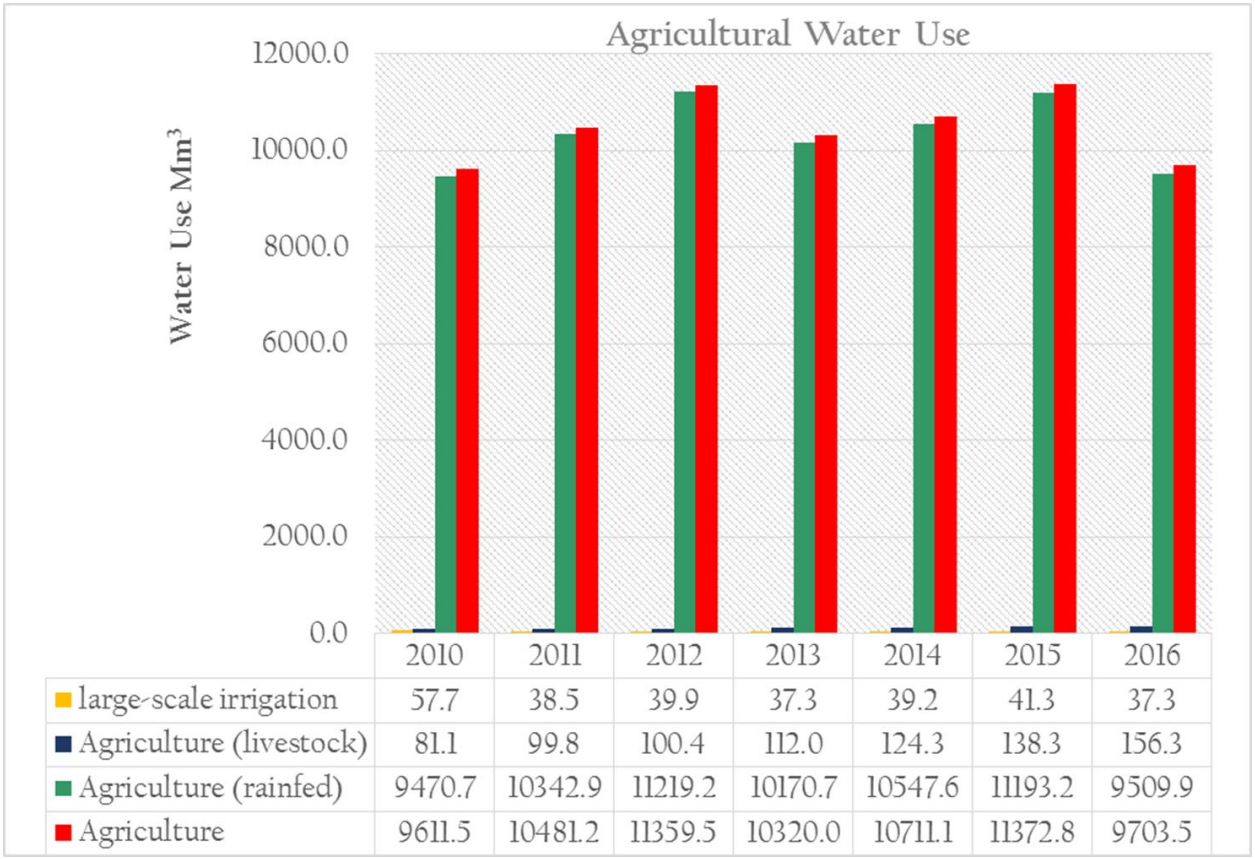




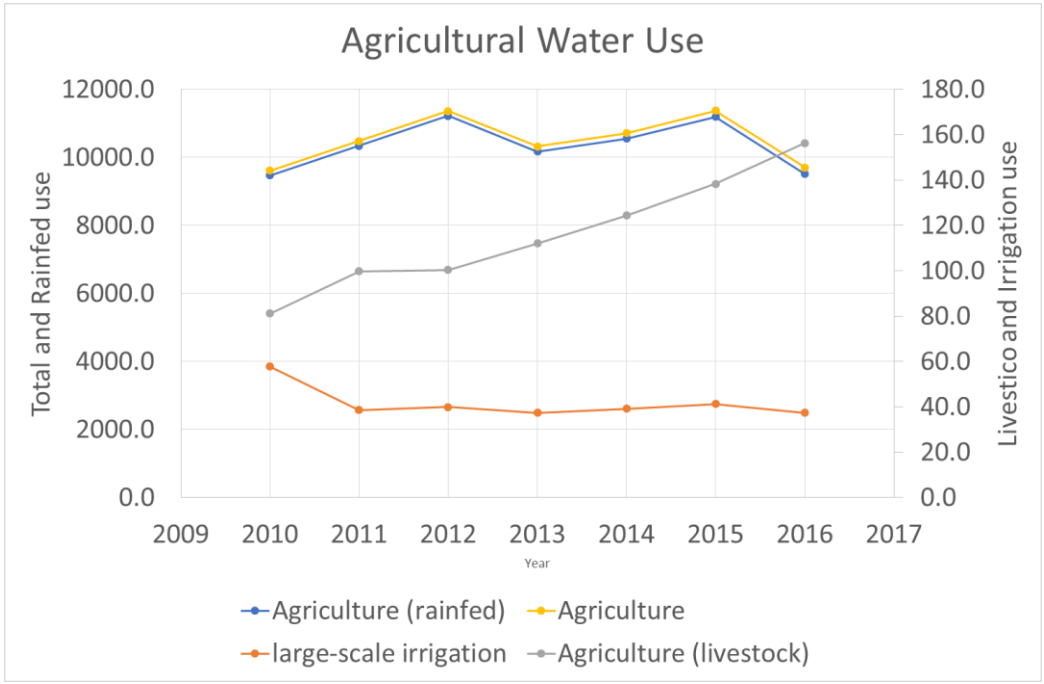
❑ 30 year average
❑ Country estimate 86.6 km³
❑ JICA (1995)

MAIN FINDINGS

❑ Agricultural Water Use

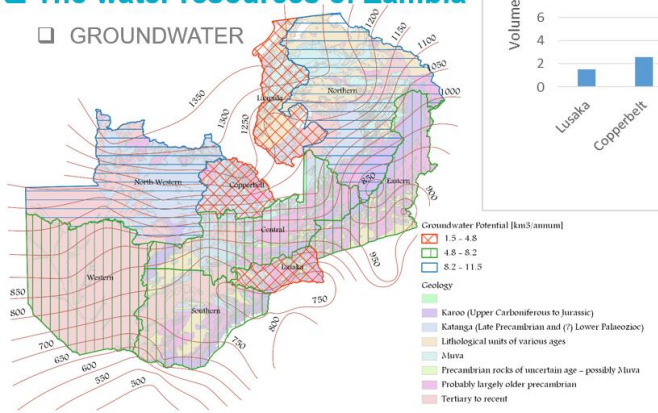


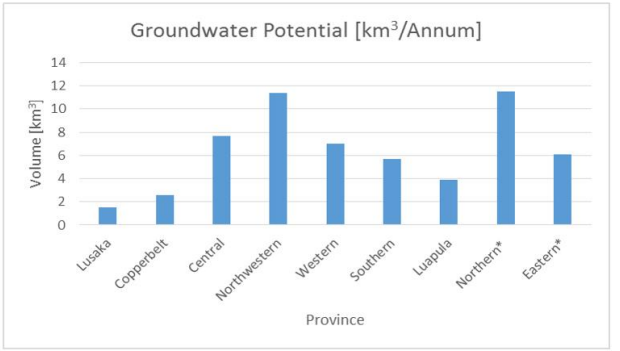
	2010	2011	2012	2013	2014	2015	2016
large-scale irrigation	57.7	38.5	39.9	37.3	39.2	41.3	37.3
Agriculture (livestock)	81.1	99.8	100.4	112.0	124.3	138.3	156.3
Agriculture (rainfed)	9470.7	10342.9	11219.2	10170.7	10547.6	11193.2	9509.9
Agriculture	9611.5	10481.2	11359.5	10320.0	10711.1	11372.8	9703.5



❑ **The water resources of Zambia**

❑ GROUNDWATER





❑ Country estimate 57.4 km³

❑ JICA (1995)

TECHNICAL CHALLENGES ENCOUNTERED

- Heavy and specialized detail of data processing e.g. conversion of crop yields into Agric water use;
- Requirement for advanced water resources modelling and water resources concepts to fill in data gaps;
- Lack of standardized data on water statistics;
- Limited number of personnel conversant with the SEEA-Water concept; and
- Lack of dedicated ICT for the Water Account

NEXT STEPS

- Development of the PSUTs & MSUTs for the period 2017 to 2018;
- Development of the Water Asset Account;
- Development of a policy brief on NCA – Water

RECOMMENDATIONS

- Development of an integrated water statistics database and information management system for Zambia based on the International Recommendations for Water Statistics;
- Mainstreaming of NCA and associated capacity building; and
- Need for dedicated ICT for Water Accounting

THANKYOU!!!