Gender Based Labour Income Dynamics across 34 economic Sectors in South Africa: A Consequence of Kusile and Medupi Infrastructure Investment Programme

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Abstract

Noting the country's commitment to infrastructure development, the study focused on the gender dimension of labour market on electricity infrastructure development with reference to on "Kusile" and "Medupi" Power Plants. Applying SAM-Based Model, South African economy has been disaggregated into 34 industries which shows the difference on income levels by gender and the findings shows a clear picture of the unequal gender-pay gap in South Africa. At the construction phase of "Kusile" and "Medupi", all sectors supported employment for males compared to females except two industries which are community, social & personal service and trade which consequently resulting in high income for males compared to females. The findings show that at both the construction and operational phase, in mining and agriculture males continues to largely earn more than women. Though in various industries females earn more than females, it is evident that this is as a result of government policy intervention on women empowerment in the construction sector.

Keywords: Gender, Income, Labour, Infrastructure and Social Accounting Matrix.

1. Introduction

South Africa is one of the most unequal countries in the world in terms of income distribution. This is largely a result of inequalities engineered by colonialism and apartheid. Measures undertaken since 1994 to address these disparities have been somewhat successful, but South Africa is still plagued by high levels of inequality (Oxfam, 2014). The term 'inequality' refers to the differences that exist between various population groups and/or individuals. The term has been defined as "the state or quality of not being equal" and "social or economic disparity" (Oxfam, 2014). Much literature on inequality in South Africa refers to 'economic inequality', which is inequality in standards of living within a country. Non-economic inequalities include gender inequality, education inequality, health inequality, social inequality and participation inequality (Oxfam, 2014). This study however focuses on income inequality and infrastructure investment in South Africa.

According to World Bank (2010), challenges of poor infrastructure fall on the shoulders of women and young women due to gender inequalities in household maintenance and caretaking duties assigned to them. For women to fully enjoy their right of choice, various measures and enabling environment should be created. Amongst others but

not limited to is the availability of adequate social and economic infrastructure where women are afforded equal opportunity to men to fully participate in the planning, execution and utilisation of such.

Within infrastructure investment projects, South Africa has amongst others identified two energy projects that are expected to increase the country's electricity production and improve on stable electricity supply. These projects are Kusile Power Plant and Medupi Power Plant and according to Engineering News, Projects in Progress, (March 2015), the investment for these projects is estimated to the tune of R118.5 billion and R105 billion, respectively. At both the construction and operational phase, these projects are expected to stimulate economic growth and create jobs. Of critical importance in a developing economy like South Africa is the extent at which women are afforded equal opportunity as men to participate as developers and suppliers of labour in these economic projects.

In their book; Perkins, et al, (2001); they emphasise that the absolute welfare of women and girls is likely to benefit from economic development, particularly when it is accompanied by efforts to provide jobs and small-scale credit to lower-income women, and educational and health services to women and girls. It is evident that economic growth and development alone are not sufficient to improve the social and economic status of women; more efforts are required to ensure that economic growth and development translate into human development, "gender equality and women's empowerment".

Another challenge facing women in South Africa is access to labour markets. Despite efforts by government to put in place measures such as "affirmative action", "employment equity", and "policy framework for women empowerment and gender equality" to create enabling environment for women; women remain the largest unemployed population in the country. As argued by Orr & van Meelis (2014) there has been improvement in women's participation in paid work in South Africa and globally, but this has tended to be in low-paid, low status and insecure employment, however, women continuous to spend time on unpaid work and unemployed in the formal labour market. Furthermore, development in definition and changing methods of measurements on understanding employment results in a certain degree of increase instead if change in levels of employment (Orr & van Meelis, 2014).

Noting the high levels of gender income inequality, poverty and unemployment, the study therefore, seeks to examine the impact of electricity infrastructure investment focusing to "Kusile" and "Medupi" Projects on the gender dimension of labour in South Africa. To examine the impact, Social Accounting Matrix (SAM) will be used. According to Eskom (2015) and Barradas (2017) capital investment to a total value of R118.5 billion will be invested in the development of "Kusile Power Station Project" which is expected to generate 4 800 MW. The second project is "Medupi Power Station Project" where Government has invested approximately R105 billion and is expected to generate 4 800 MW (Engineering News, Projects in Progress, 2015).

2. Literature Review

Good access to quality and sustainable infrastructure is an essential determinant of

people's wellbeing and a basic requirement for businesses to prosper. High-quality infrastructure from digital, transport, energy and water to public parks and museums underpins inclusive growth and supports sustainable development, in line with the 2030 Agenda. Infrastructure is essential to foster equal opportunities, to connect left-behind regions, ensuring easy access to public services for citizens and, in general, to improve life quality, (OECD, 2019). In developing infrastructure, the needs of both men and women must be considered. Thus, adequate infrastructure provides sound opportunities for income generation across race, gender age.

Globally, gender income inequality remains a challenge and South Africa is not an exception to this. Proper planning and implementation of all infrastructure project in the country can reduce the current state of gender income inequality, commonly known as gender pay gap. Bobbitt-Zeher (2007) argues that the gender pay gap is the variance of what men and women are paid. Most commonly, it refers to the median annual pay of all females who work full time and year-round, compared to the pay of a similar cohort of men. Other estimates of the gender pay gap are based on weekly or hourly earnings or are specific to a group of females. Various factors have been identified by various scholars as contributors widening or existing global gender pay gap and education is amongst those. As argued by Bobbitt-Zeher (2007) education is thought to be the pathway to success for disadvantaged groups. Given that young females now match or surpass male's educational achievements on many measures, how do they fare in terms of equal earnings? Would further educational changes matter for closing any existing gap? Analysing data from the National Educational Longitudinal Survey, Bobbitt-Zeher (2007) found that college-educated men in their mid-20s already earn, on average, about $7,000 more per year than do college-educated females. The findings further suggest that this gap would still be substantial--about $4,400 per year--if females and males had similar educational credentials, scores on standardised tests, fields of study, and degrees from colleges of similar selectivity. Although female's gains in education may have been central to narrowing the gender gap in income historically, gender differences in fields of study continue to disadvantage female. Moreover, gender differences in work-related factors are more important than are educational differences for understanding contemporary income inequality among young workers (Bobbitt-Zeher, 2007).

As argued by ILO (2011) gender gap between men and women in the labour market is due to both the contribution of human capital differences and discrimination. Men typically earn more than women, with this gap being attributed to differences in productive characteristics, occupational choice and discrimination (Padayachie, 2015). Those women presently working in the construction sector have been facing many type of socio-cultural barriers, religious issues, discrimination, harassment and a lack of equal opportunities. This is further supported by Padayachie (2015) who argued that a vast literature on the gender wage gap across different institutional structures and economies exists. The enforcement of gender sensitive policies can also ensure interventions to address gender disparities in the construction sector (ILO, 2011). Arguable, policy development and implementation should not be seen as government responsibility only, it of critical importance that the private sector play an equal role in gender equality; women empowerment and policy design,

development and implementation thereof.
To successfully attain women economic empowerment, policy development must consider gender specific needs of women in a long-term. According to OECD (2012), women must have equitable ingress to assets and services; infrastructure development should be designed to empower the poor, both men and women, and job opportunities must be ameliorated while increasing recognition of women's vast uncompensated work. Of critical importance is a clear integration of all stakeholder responsible and participating in the development work and women's empowerment, continuous dialogue and new effective and efficient way of doing things must be embraced by development agencies at international, national and local level (OECD, 2012). As argued by Richter (2019), Ultimately, sustainable change can only stem from underlying changes within organisations. Amongst others, compulsory gender pay reporting proves to be a catalyst in helping to manage and concentrate minds on how to build diversity and inclusion into a more compelling employee value proposition in areas ranging from talent development and succession planning to flexible working and work life balance. This goes beyond gender and can potentially affect the approach to all aspects of diversity in South African organisations (Richter, 2019). It is against this background that gender mainstreaming must be understood as a critical component of sustainable development.

3. Data and Methodology

3.1 Data Source

The Social Accounting Matrix (SAM) is used as a database and a tool for impact analysis is this study. A variety of data sources are required to build a SAM. Because the methods used in collecting and generating statistics differ significantly from one source to another (e.g. "national income accounts", "I-O Tables", "census information", "multi-purpose household surveys", "surveys of enterprises"; "balance of payments statistics"; and "public finance data"), the process of building a SAM provides a natural check on the mutual consistency of the sources and identifies potential data gaps and errors. In this sense, the process of reconciliation that is endemic in generating a SAM has value (Mosenogi, 2019).
This study uses the South African SAM build by Conningarth Economist. In building South African SAMs, Conningarth Economists (2014) makes use of input data provided by a variety of sources, but primarily from Statistics South Africa (StatsSA), which publishes "national accounts" data, "population censuses", and "household income and expenditure surveys"; and from the South African Reserve Bank (SARB) Quarterly Bulletins that include integrated economic accounts (IEA). In terms of accounting concepts, data sources must be attained about each SAM account, i.e.:

- "The structure of production – in terms of interindustry linkages, disaggregation of final demand, and gross value added, data is derived from the I-O Table published by StatsSA, which is the most basic data source with the longest history of publication. In the past, StatsSA published a new I-O Table every 5 year. However, more recently, StatsSA is trying to reduce this publication interval";
- "Data regarding income generation by factors of production and income

distribution by institutional agents is derived from labour force survey data, census of establishments data, and gross regional product and expenditure accounts published by StatsSA", and

- "Government Accounts data is derived from National Treasury Database for Municipal Accounts, and the SARB Quarterly Bulletin".

Foreign trade statistics are available at the national level. While commodity flows can be deduced from official data; there are limitations in the data collected, most of which relates to the fact that the sources do not contain origin-destination data (Conningarth Economists, 2014). Table 1 below shows the latest South African SAM build by Conningarth Economists.

Table 1: South African Social Accounting Matrix (Rand million; 2015 prices)

NATIONAL ACCOUNTING MATRIX FOR SOUTH AFRICA

[Rand million; 2015 prices]

Republic of South Africa National Accounting Matrix (2015 Basic Prices)		Activities	Commodities	Factor Payments 1 Labour	Factor Payments 2 Capital (GOS) - Net Operating Surplus plus Consumption of Fixed Capital	Public and Private Enterprises - Enterprise Income Paid	Households	General Government 1 Central Government	General Government 2 Provincial Government	General Government 3 Local Government	Capital Account 1 General Government	Capital Account 2 All Other Sectors (incl. Public Corporations)	Rest of the World 1 Factor Payments	Rest of the World 2 Goods & Services	Rest of the World 3 Transfers	Capital	Discrepancy	
Activities			5 563 343											1 233 094				6 796 437
Commodities		3 862 096					2 438 027	123 235	96 466	56 570	142 485	689 561					-24 418	7 384 022
Factor Payments	Labour	1 339 922						204 090	272 750	75 959			10 488					1 903 209
	Capital (GOS) - Net Operating Surplus plus Consumption of Fixed	1 527 091						41 121	21 769	35 616			87 529					1 713 126
Public and Private Enterprises - Enterprise Income Received					959 950			146 160	24	7 039								1 113 173
Households				1 890 717		698 367	10 206	212 450	2 200						21 052			2 834 992
Central Government	1 Property income				31 307													31 307
	2 Transfers					22 989	11 888	-84 102							3 236			-45 989
	3 Direct tax					212 909	272 216											485 125
	4 Indirect tax	15 188	438 785					7 676										461 649
	5 Subsidies	-3 483	-15 005					13 693										-4 795
Provincial Government	1 Property income																	
	2 Transfers							445 330										445 330
	3 Direct tax						16 435											16 435
	4 Indirect tax	9 075																9 075
	5 Subsidies	-2 820							7 615									4 795
Local Government	1 Property income																	
	2 Transfers							87 324	4 063									91 387
	3 Direct tax						105 021											105 021
	4 Indirect tax	49 368																49 368
	5 Subsidies																	
Capital Account	1 General Government				77 696			-150 490	31 610	64 496								23 312
	2 All Other Sectors (incl. Public Corporations)				482 701	178 908	-27 173											634 436
Rest of the World	1 Factor Payments			12 492	185 890			-123 482										74 900
	2 Goods & Services		1 396 899															1 396 899
	3 Transfers						8 372	4 292	39 138	6 096								57 898
Balance on Current Account																-174 298		-174 298
Capital											-119 173	-55 125						-174 298
Discrepancy					-24 418													-24 418
Total		6 796 437	7 384 022	1 903 209	1 713 126	1 113 173	2 834 992	927 297	475 635	245 776	23 312	634 436	90 017	1 233 094	24 288	-174 298	-24 418	25 206 098

Source: Conningarth Economist

"the construction of a SAM should begin by recasting the macroeconomic accounts for the economy into a simple matrix tableau, a so-called Macro SAM, followed by the construction of a detailed micro SAM" (Reinert et al: pp, 1997).

3.2 Methodology

Various types of analytical tools may be adopted to assess the impact of investment on employment and income by gender. However, since investment is a component of the national aggregate demand, a 'Keynesian 'type of demand driven (multiplier) approach may prove to be the most suitable choice for understanding such questions.

The Social Accounting Matrix (SAM) is an accounting platform that offers such a perspective.

First, households supply labour and receive part of their income as wages. Second, it is assumed that firms are owned by households and households receive all profits from the firms. This link between firms and households originates from the theoretical proof existence of the general equilibrium as it guarantees the fulfilment of the Walras' law (see for example Debreu, 1959). Third, households receive transfers, such as social transfers and unemployment benefits from the government, and also remittances (transfers from the rest of the world). Hence, the total income received by households *Y*, in a given time period (in our case year) can be represented as:

$$Y = Pk.KS + Pl(LS - Unemp) + GHtrf + R.WHtrf + CPI.HHtrf \quad (1)$$

where KS and LS are the total capital and labour supplies, Unemp is the level of unemployment, *GHtrf* represent transfers of unemployment benefits, WHtrf and HHtrf are remittances and inter-household transfers accordingly, and *Pk* and *Pl* stand for capital rental rate and nominal wage.

A household disposes of its income in the following way. It pays income tax ty.*Y* and social contribution HGtrf to the government and inter-household transfers HHtrf. He also transfers part of its income to the rest of the world HWtrf. In the case when all capital in the model is assumed to be owned by the households, this latter variable represents generic transfers, such as the return on foreign owned capital, income from foreign labour and other transfers abroad. A fixed portion of the remaining income is saved according to (2).

$$Sh = mps.(Y - ty.Y - R.HWtrf - CPI.HGtrf - CPI.HHtrf) \quad (2)$$

Where, mps is a marginal propensity to save parameter. Real social contribution HGtrf is fixed, however nominal amount varies with inflation. Since transfers to the rest of the world are expressed in foreign currency it is multiplied by the nominal exchange rate *R*. Therefore, the net income or household's budget available for consumption *B* is defined as

$$B = Y - ty.Y - Sh - R.HWtrf - CPI.HGtrf - CPI.HHtrf \quad (3)$$

To effectively deploy SAM, the following approach is applied:

It is assumed that all workers in the economy receive the same average wage *PL (*PL_M *and* PL_F*)*. This, rather strong assumption could be relaxed by introducing the sectoral distortion parameters given the availability of data on the number of workers in each sector (see Robinson *et al.*, 1999 for details). Although total labour supply LS (LS_M and LS_F) is fixed, the amount available for production could vary as workers move in and out of unemployment Unemp ($Uemp_M$ and $Uemp_F$) according to the wage curve relationship (4), is also known as the Phillips curve type of relationship.

$$\frac{\omega^1 - \omega^0}{\omega^0} = \rho \frac{u^1 - u^0}{u^0} \quad (4)$$

Where

u_M = **Unemp$_M$/LS$_M$**; ω_M = PL_M /*CPI*

u_F = **Unemp$_F$/LS$_F$**; ω_F = PL_F /*CPI*

The superscript 0 represent the benchmark equilibrium whereas 1 represent value after some change; *CPI* stands for consumer price index and ϱ denotes the Phillips parameter, which has to be obtained from other sources. Assumption (4) along with fixed nominal wage (will be dealt with latter) implies that unemployment clears the market and hence defines the labour market to be demand driven.

For the price of capital, two specifications will be considered each corresponding to a different capital closure rule. In the basic model all sectors face an average capital rental rate *Pk*. Thus, with fixed total capital supply the price is restricted by scarcity. Alternatively, the capital rental rate Pk_i could be sector specific and depend on the sectoral composition of capital goods. In other words, equation (5) reads that the capital rental rate in a sector i is a weighted average of the prices of composite commodities used by this sector as capital goods.

$$Pk_i = \sum_{j=1}^{n} w_{ij} P_j \quad (5)$$

Where

$$\sum_{j=1}^{n} w_{ij} = 1$$

This representation of capital price is crucial for the simulation of the electricity production increase as it allows for sectoral capital accumulation to be demand driven given the endogenous total supply. However, in the basic specification, total capital stock and labour supply are fixed exogenously, and factor markets clear according to equations (6) and (7):

$$LS = \sum_{i=1}^{n} L_i + Unemp \quad (6)$$

$$KS = \sum_{i=1}^{n} K_i \quad (7)$$

Next in the process of producing the multipliers, the Leontief Inverse is calculated. A SAM model can be written as:

$X - AX = Y,$ (8)

where X is the column vector of industrial gross output, Y is the column vector of exogenous final demand accounts, and A is the direct requirement matrix.

We can express this equation as:

$(I - A)X = Y$ (9)

or

$X = (I – A)^{-1} Y$ (10)

$X = BY,$

(11)

where

I is the identity matrix (with "1" in the diagonal, "0" in all other fields), $(I-A)^{-1}$ is the "Leontief Inverse (Matrix)" = B (or B' if induced effects are included), B (or B') is the matrix of direct and indirect (and induced) coefficients bij (or b'ij), and bij (or b'ij) = "Leontief Coefficient" representing the direct and indirect (and "induced") requirements per unit of final demand for the output of sector j.

Thus, computing employment is done as follows:

As Argued by Fathurrahman (2014), to do this, let's assume "e" as an employment coefficient which is described as total manpower needed per billion IDR of sectoral output. In mathematical form it can be written as follows:

$e_j = Employment_j/Y_j$

(12)

Where:

Y_j = Total output of sector in row j

Employmentj = Total employment for sector in row-j

e_j= employment coefficient for sector in row-j

The employment coefficient used in the study can be seen in Table 13. Here, we assume those employment coefficients will remain constant regardless of changes in sectoral output. The employment impact (changes) then can be assessed by multiplying employment coefficient by each sector's output changes:

$\Delta\circledcirc_{\circledcirc} = \Delta\circledcirc_{\circledcirc}\circledcirc_{\circledcirc}$

(13)

Where:

$\Delta\circledcirc_{\circledcirc}$ = Employment impact (changes) for sector in row-j

(14)

$\Delta\circledcirc_{\circledcirc}$ = Output changes for sector in row-j

(15)

To get the model started, the turnover of the business economy associated with the electricity infrastructure investment are regarded as "outside agents" impacting on the model through an increase in its final demand components. The implication of this is that for every project a (column) vector for every relevant final demand component of the model, on a commodity basis, had to be compiled. Each of these final demand components had to be disaggregated on a detailed basis, such as turnover and intermediate demand on labour by gender basis, salaries and wages, gross operating surplus (GOS), number of workers per skill level, portion of goods and services to be

exported, etc. The model structure is based on the Standard Industrial Classification (SIC) of sectors.

4. Analysis and Findings

This section presents results based on multiplier analysis using Social Accounting Matrix. The results were purely obtained using the "investment" into construction of Kusile and Medupi. However, analysis is done to assess the impact of such investment at construction phase and operational phase of these two power stations.

4.1 Gender Based Income Results

The labour market position of (South African) women hasn't changed much over the last decade; in fact, it has deteriorated in some respects (Statistics South Africa, 2018). According to Bosch (2020) the gap between what men and women earn is an important indicator of both equality and equity. In Table 1 below the annual earnings by females and males resulting from the macroeconomic impact of Medupi and Kusile project at construction phase in terms of income are presented. In general, Women in South Africa continues to increase their participation in the construction sector and the government's EPWP employs more females compared to males. The primary sector, which is agriculture and mining shows to be male dominated with males earning far much higher than that of females at R1,706.04 to R689.02 and 5,881.01 to 1,441.87, respectively. Interestingly, from the multiplier results female's earning are higher than that of males across the electricity sector and building and construction sector. Though the study is for Kusile and Medupi projects investment, the study results shows the total sectors result bases on employment and sum of direct, indirect and induced results. While this is the case, in most sectors males are employment in higher skilled areas and continues to earn higher that females in terms of employment by skills level and earning thereof (Mosenogi and Daw, 2019). It is also interesting to investigate the other sectors such as mining that supply inputs to electricity industry, only 40.3% of earnings of the amount paid to males in the same position are destined to females. Even in sectors such as agriculture where females are generally expected to be earning on the higher bracket, males are still dominant. This implies that the largest share of labour income accrues to men in mining, construction, other manufacturing, transport and communication. In the electricity industry and communications amongst the few, at the construction phase females benefits far much higher than males where males earn 22.2% and 31.1% of what females earns in the industry, respectively. From table 1 below, it is generally evident that at the construction phase of Kusile and Medupi project, the economy wide impact of these project on gender-based income is largely skewed towards males.

Table 1: Annual Earnings by Females and Males from the Impact of Medupi and Kusile – Construction Phase

	Total Income Earnings	Female / Male Ratio	Female Earnings	Male earnings
Economic Sector	**2018 Prices, R Millions**		**2018 Prices, R Millions**	
1.Agriculture	R7,322.88	0.2452	R1,441.87	R5,881.01
2.Mining	R2,395.06	0.4039	R689.02	R1,706.04
3.Meat, Fish, Fruit, Vegetables, Oils and Fat Products	R144.58	0.6963	R59.35	R85.23
4.Dairy products	R152.14	1.5691	R92.92	R59.22
5.Grain Mill, Bakery and Animal Feed Products	R389.55	1.6100	R240.30	R149.25
6.Other food products	R194.25	1.6528	R121.02	R73.23
7.Beverages and tobacco products	R2,005.68	1.6973	R1,262.10	R743.58
8.Textiles, Clothing, Leather Products and Footwear	R464.28	2.2699	R322.29	R141.99
9.Wood and Wood Products	R193.99	2.3458	R136.01	R57.98
10.Furniture	R315.89	2.4262	R223.70	R92.20
11.Paper and Paper Products	R430.14	2.5114	R307.64	R122.50
12.Publishing and Printing	R255.59	2.6019	R184.63	R70.96
13.Chemicals & Chemical Products (incl Plastic Products)	R2,519.79	2.6981	R1,838.41	R681.37
14.Rubber Products	R208.70	2.8006	R153.79	R54.91
15.Non-Metallic Mineral Products	R649.96	2.9101	R483.74	R166.22
16.Basic Metal Products	R523.46	3.0273	R393.49	R129.98
17.Structural Metal Products	R129.02	3.1531	R97.96	R31.07
18.Other Fabricated Metal Products	R327.07	3.2883	R250.80	R76.27
19.Machinery & Equipment	R800.02	3.4341	R619.59	R180.42
20.Electrical Machinery & Apparatus	R631.97	3.5918	R494.34	R137.63
21.Communication, Medical and other Electronic Equipment	R84.04	3.7629	R66.40	R17.65
22.Manufacturing of Transport Equipment	R1,474.66	3.9491	R1,176.70	R297.97
23.Other Manufacturing & Recycling	R543.70	4.1526	R438.18	R105.52
24.Electricity	R26,648.13	22.1933	R25,499.18	R1,148.96
25.Water	R80.69	28.8089	R77.99	R2.71
26.Building & Construction	R12,987.98	1.4909	R7,773.91	R5,214.07
27.Trade	R24,082.63	2.3333	R16,857.84	R7,224.79
28.Accommodation	R733.54	1.5000	R440.12	R293.42
29.Transport	R2,629.57	23.5435	R2,522.43	R107.14
30.Communication	R1,599.08	31.1012	R1,549.27	R49.81
31.Finance & Insurance	R11,651.06	6.6847	R10,134.92	R1,516.14
32.Real Estate	R1,445.14	7.2352	R1,269.66	R175.48
33.Business Services	R5,489.72	8.0909	R4,885.85	R603.87
34.Community, Social and Personal Services	R16,167.84	3.8522	R12,835.76	R3,332.08
Total	R125,671.80			

Source: Authors Own SAM-Based Model Computation Results.

Table 2: Annual Earnings by Females and Males from the Impact of Medupi and Kusile – Operational Phase

	Total Income Earnings	Female / Male Ratio	Female Earnings	Male earnings
Economic Sector	**2018 Prices, R Millions**		**2018 Prices, R Millions**	
1.Agriculture	R4,029.74	0.2452	R793.45	R3,236.28

2.Mining	R1,317.99	0.4039	R379.16	R938.83
3.Meat, Fish, Fruit, Vegetables, Oils and Fat Products	R79.56	0.6963	R32.66	R46.90
4.Dairy products	R83.72	1.9556	R55.39	R28.33
5.Grain Mill, Bakery and Animal Feed Products	R214.37	2.0145	R143.25	R71.11
6.Other food products	R106.89	2.0765	R72.15	R34.75
7.Beverages and tobacco products	R1,103.72	2.1417	R752.41	R351.31
8.Textiles, Clothing, Leather Products and Footwear	R255.49	3.0327	R192.14	R63.35
9.Wood and Wood Products	R106.75	3.1588	R81.08	R25.67
10.Furniture	R173.84	3.2945	R133.36	R40.48
11.Paper and Paper Products	R236.70	3.4408	R183.40	R53.30
12.Publishing and Printing	R140.65	3.5991	R110.07	R30.58
13.Chemicals & Chemical Products (incl Plastic Products)	R1,386.62	3.7708	R1,095.97	R290.65
14.Rubber Products	R114.85	3.9577	R91.68	R23.17
15.Non-Metallic Mineral Products	R357.67	4.1620	R288.38	R69.29
16.Basic Metal Products	R288.06	4.3862	R234.58	R53.48
17.Structural Metal Products	R71.00	4.6333	R58.40	R12.60
18.Other Fabricated Metal Products	R179.98	4.9069	R149.51	R30.47
19.Machinery & Equipment	R440.25	5.2117	R369.37	R70.87
20.Electrical Machinery & Apparatus	R347.77	5.5533	R294.70	R53.07
21.Communication, Medical and other Electronic Equipment	R46.25	5.9386	R39.58	R6.67
22.Manufacturing of Transport Equipment	R811.50	6.3767	R701.49	R110.01
23.Other Manufacturing & Recycling	R299.19	6.8791	R261.22	R37.97
24.Electricity	R14,664.31	8.0909	R13,051.23	R1,613.07
25.Water	R44.40	9.0000	R39.96	R4.44
26.Building & Construction	R7,147.21	1.8443	R4,634.43	R2,512.78
27.Trade	R13,252.52	2.3333	R9,276.77	R3,975.76
28.Accommodation	R403.66	1.5000	R242.20	R161.46
29.Transport	R1,447.04	1.8571	R940.57	R506.46
30.Communication	R879.96	3.0000	R659.97	R219.99
31.Finance & Insurance	R6,411.51	16.3492	R6,041.95	R369.56
32.Real Estate	R795.25	19.7401	R756.91	R38.34
33.Business Services	R3,020.96	8.0909	R2,688.65	R332.31
34.Community, Social and Personal Services	R8,897.06	6.1462	R7,652.06	R1,245.00
Total	R69,156.43			

Source: Authors Own SAM-Based Model Computation Results.

Table 2 above present study findings on annual earnings by females and males on the basis of Kusile and Medupi investment post construction phase. The results therefore the potential economic impact of Kusile and Medupi in the South African economy in terms income by gender across 34 economic industries should both power plant operate at full capacity. Post construction phase of these power plants, the economic spill offs largely benefits females. Out of 34 industries, males dominate earning in three (3) industries only while the rest is skewed towards females. However, compared to construction phase impact analysis, the marginal difference of income is very small at operation level which in general does not benefit females at a large scale.

Males dominant industries are agriculture; mining and meat, fish, fruit, vegetables, oils and fat products of which female workers earns about 24.5%, 40,4% and 69.6% of the amount a male employee in the same economic sector would receive. Though

most industries show to be females dominated, it worth important to understand the level and role of females in various industries remains unequal to that of males and consequently the gender pay gap persist. As argued by Bosch and Barit (2020) Despite the presence of constitutional rights and enabling legislation to prevent workplace gender discrimination, South Africa continues to see a stagnant median gender pay gap of between 23% and 35%. Thus, illustrating the importance of legislation enforcement and investment in women empowerment.

5. Conclusion

Despite the deeply entrenched gender inequality in South Africa, the said investment in Kusile and Medupi power plants shows to have some positive income effects on females in some economic industries. Mining and agriculture continues to be male dominated and accrues more income to males. Though the targeted sector was not agriculture and mining, this study provides a valuable lesson to government and policy makers in ensuring that there is a deep understanding of multiplier effects of public policy decision making. The importance of women empowerment on both human and economic development cannot be over-emphasized. It is against this back-drop that in infrastructure development planning, gender mainstreaming be seriously considered and implemented. As proved in the study, women remain under-paid compared to men and consequently do not equally benefit from the economic policy implementation of government. As argued by Bosch (2020) if men and women get equal pay for equal work, it is likely that society values both genders equally. On the other hand, a large gender pay gap is a signal that society is not equal and fair.

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