DEVELOPMENT PATHWAYS

Economic and Poverty Impacts of the ESP programme in Uganda

Results from a SAM and DCGE Modelling Approach

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Executive Summary

Background

Expanding social protection in Uganda through the ESP programme is important not only for promoting economic growth and reducing poverty, but also to help address many other challenges which the country currently faces such as improving Uganda's relatively low human capital stock. As shown by the literature, countries that have invested in social security cash transfer schemes have benefited from a healthier and more qualified workforce.

Despite acknowledging the salutary impacts of social protection investment, the Ministry of Gender, Labour and Social Development (MGLSD) and the Ministry of Finance, Planning and Economic Development (MFPED) have agreed to collaborate and, together, assess the potential economy-wide impacts of expanding social protection in Uganda, before committing to expand the social protection investment in Uganda – specially within the purview of the National Development Plans (NDPs).

Two sets of methodologies have been used to assess the economy-wide impacts of the visioning proposals under the ESP programme in Uganda. The simulation models applied were – (i) a social accounting matrix (SAM) based SAM multiplier model for assessing static impacts; and (ii) a dynamic general equilibrium (DCGE) model across selected years from 2017 to 2031. The SAM model is static with fixed prices and with no supply side constraints. The DCGE is dynamic with flexible prices and invoke supply side and other constraints. Thus, the outcomes of DCGE model are more restrained than that of the SAM model. In both simulation models, simulation set ups (or simulation design) are defined in a ***first stage***. Under a partial equilibrium approach, the proposed expansion of the ESP was reviewed and transfer values to different household groups were determined. In the ***second stage***, the estimated expansion of ESP and its injection amounts (derived in the first stage) were fed into the simulation models to assess the economy-wide impacts.

The main dataset for this study is the 2017 SAM developed by MFPED. However, in order to meet the requirement of the current study, the original 2017 SAM has been modified. The modifications include (a) reclassification of the household account into 32 household groups based on 4 regions (Central, Western, Easter, and Northern), 2 locations (rural and urban) and 5 age groups (more specifically, early childhood - 0 to 4 ages; school age - 5 to 14; youth - 15 to 29; working group - 30 to 64; and elderly - 65 and above). A poverty module based on the 2016/17 Uganda national household survey (UNHS) is also used to determine poverty and inequality impacts of ESPs by linking consumption changes derived in the SAM and DCGE models.

SAM model

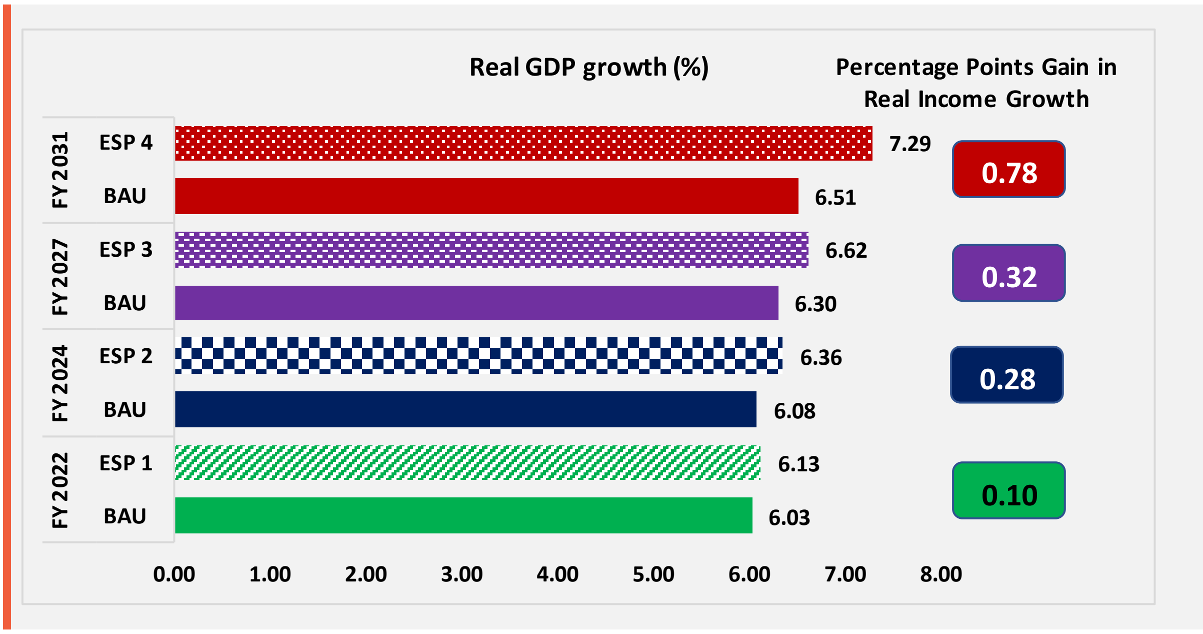
Simulation Design: ESP simulations are compared with a BAU scenario. The BAU scenario is generated on the assumption that there is no expansion of Social Protection or other interventions in the Ugandan economy (i.e. in addition to the autonomous growth of the social protection transfer amounts). The BAU scenario is simulated for FY 2021 exactly matching the overall and sectoral GDP growth rates projected in the NDP. Three ESP simulations were designed in line with planned SP interventions and investment amounts. For instance, ESP 1 is set to start in FY 2022, composed of senior citizen grant (SCG) with an investment UGX 161.2 billion. ESP 2 which is set to start in FY 2024, includes expansion of SCG and commencement of Disability Benefit with an investment size of UGX 747.9 billion. ESP 3 which is set to start in FY 2027, includes expansion of SCG; Disability Benefit and commencement of Child Benefit with an investment size of UGX 1,901.4 billion. ESP 4 is set for FY 2031, with an investment size of UGX 6,265.8 billion.

Simulation Outcomes: The ESP transfers are direct tax-financed transfers from government to the beneficiary household groups. Total transfer amounts are expected to increase from UGX 161 billion in FY 2021/22 to UGX 6,266 billion in FY 2030/31. Ceteris paribus, as a result **consumption of all households in all 4 regions increased under ESPs.** The total ***consumption gain under ESPs over BAU consumption ranged from UGX 263 billion FY 2022 to UGX 10,250 billion in FY 2031***. Although, relatively higher ESP transfers were extended to Northern and Eastern (due to higher poverty incidence) compared to the Central and Western regions, relatively higher gains accrue to the households in the 'Central' and 'Western' regions – supposedly due to their higher integration with the economic system and growth process – a phenomenon being captured by the SAM multiplier model.

Consumption gain led to reduction in poverty rate. The gain in poverty reduction in ESP 1 over BAU 1 is -0.12 percentage points. The percentage point gain in poverty reduction is -0.30 in ESP 2, -0.9 in ESP 3 and -2.47 in ESP4. ***The number of non-poor increased from 59,195, persons in ESP 1 to 1,506,073 persons in ESP 4.***

All else constant, a positive intervention through augmenting household income and consumption is likely to enhance national income or GDP through the interdependent system and multipliers. There are two valuations of GDP – nominal and real. Nominal GDP includes the prices of the goods and services, while real GDP excludes the price factor. The simulated impacts on GDP have been found positive. The Figure below captures the real income growth in four selected years under the ESP simulations (Figure ES 1). It clearly shows the positive ***impacts of ESP in generating additional income (real GDP) compared to their corresponding BAU real incomes (real GDP).***

Figure ES 1: Real income gains under the ESP simulations



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

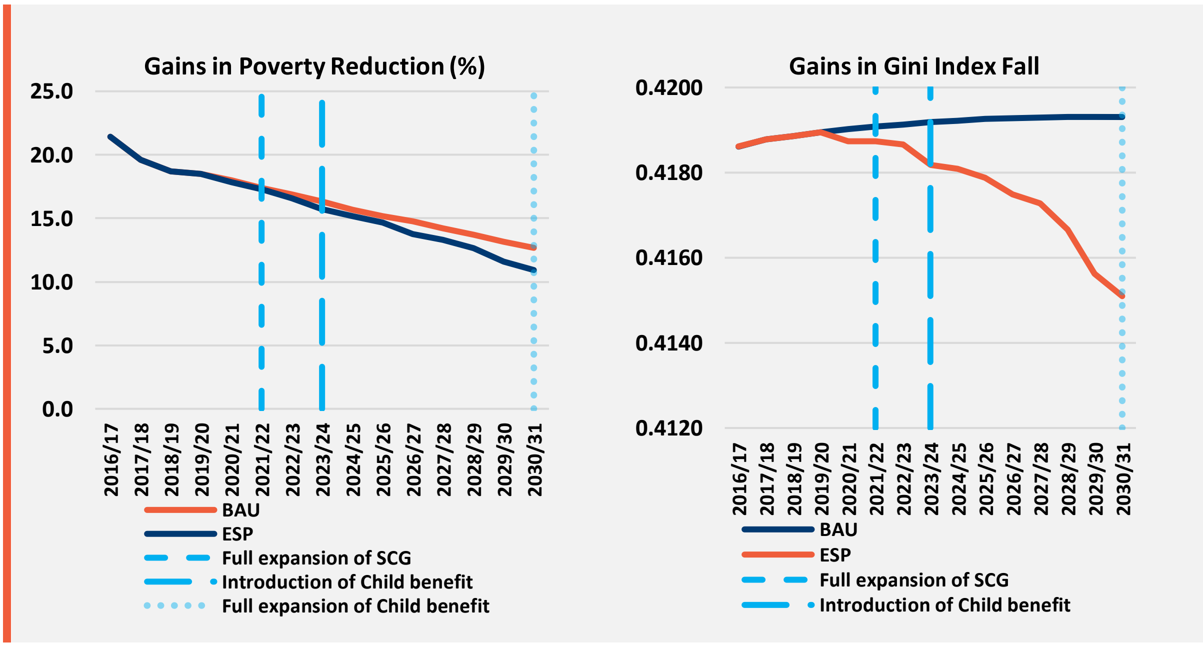
DCGE model

Simulation Design: Like the SAM model, ESP simulations are compared with a BAU scenario – but over a 10-year period covering FY 2022 to FY 2031. BAU scenario under DCGE model is different than the BAU scenario of a SAM model. BAU scenario presents growth of the economy due to two dynamic variables (or two key drivers) – accumulation of capital stock due to yearly investment and increase in labour supply due population growth. ESP simulations are activated at time frames between FY 2022 and FY 2031 – ESP 1 in FY 2022 with investment of UGX 161.2 billion; ESP 2 in FY 2024 with an investment size of UGX 747.9 billion; ESP 3 in FY 2027, with an investment size of UGX 1,901.4 billion; and ESP 4 in FY 2031, with an investment size of UGX 6,265.8 billion.

Simulation Outcomes: Like the SAM model outcome, ESPs transfer increased income/consumption all households in all 4 regions. *Household income increased from **UGX** 287 **billion** in FY **200**2 to **UGX** 7,999 **billo**n **in** FY 2031.* This also implies that household income/consumption gains as per cent of BAU income/consumption is 0.22 per cent in 2022 and increases to around 3.5 per cent in 2031. Household income increased with increased ESP interventions. For instance, in 2022, the overall income gain was UGX 228 billion against ESP interventions of UGX 161 billion. However, in 2031, the overall income gain was UGX 7,999 billion against ESP interventions of UGX 6,256 billion. Furthermore, the income gains are higher for the rural households compared to their urban counterparts, mainly due to higher level of ESP interventions in rural areas.

Simulated Impacts on poverty and Gini (a measure of inequality) are significant. Increase in income/consumption of the household groups have a salutary impact on their poverty level. Headcount poverty is likely to drop to 17.3 per cent in FY 2022 from 21.4 per cent in 2016/17 (BAU), and may drop further to 15.7 per cent in 2024; to 13.7 per cent in 2027; and to 10.9 per cent in 2031. Thus, over the 14-year period (from 2016/17 to 2030/31) the headcount poverty reduction rate is 10.5 per cent implying an annualised reduction rate of 0.75 per cent (Figure ES 2). The positive impacts of ESP transfers have been clearly found by the improvement of the income distribution as captured by the Gini index (Figure ES 2). The gains in income distribution are more pronounced with the introduction of child grants in FY 2027; and full expansion of the child grants in FY 2031.

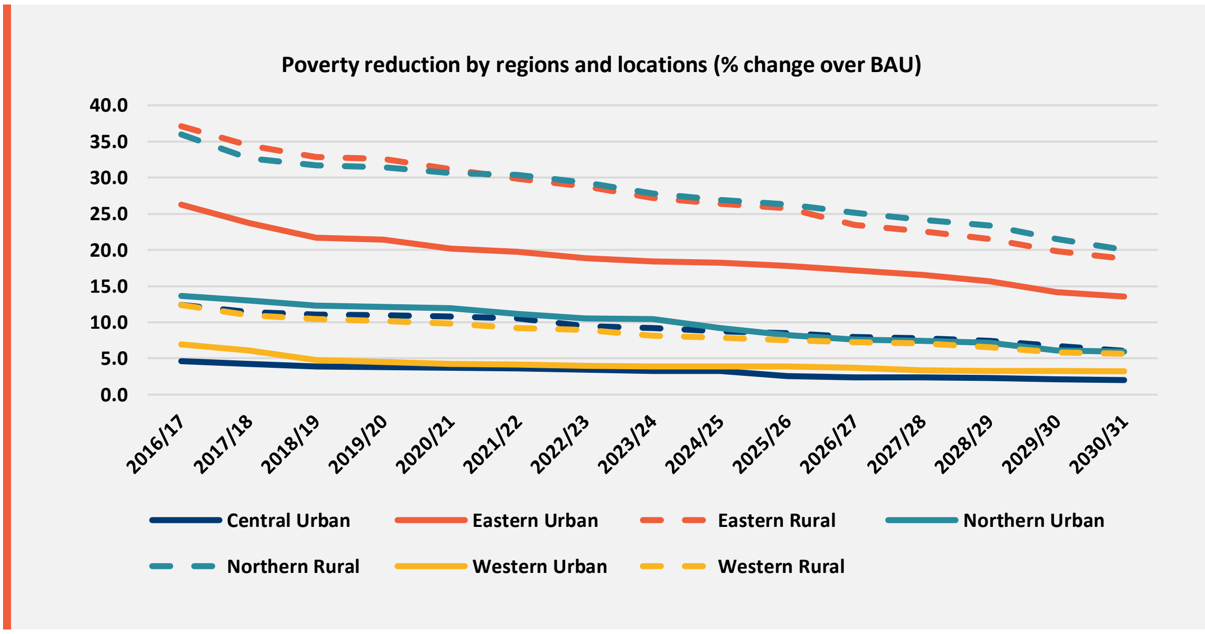
Figure ES 2: Headcount poverty and Gini index under BAU and ESP scenarios



Source: Authors' calculation, ESP DCGE model

Headcount poverty reduction rates across the eight household groups also showed significant changes over the 14-year period (Figure ES 2). Poverty reduction are highest for rural households of the Eastern and Northern regions. The poverty rate of the rural Eastern household group declined from 37.1 per cent in 2016/17 to 18.8 per cent in 2030/31, suggesting a decline of 18.3 percentage points over the 14 year-period while the poverty rate of the rural Northern household group declined from 36 per cent in 2016/17 to 20 per cent in 2030/31. Poverty reduction trend are similar for three household groups: Northern urban; Western rural and Central rural on the other hand, poverty reduction rates are lowest among the Western urban and Central urban household groups. The poverty reduction trend of ESP thus envisaged highly pro-poor interventions with respect to poorest household groups in Uganda.

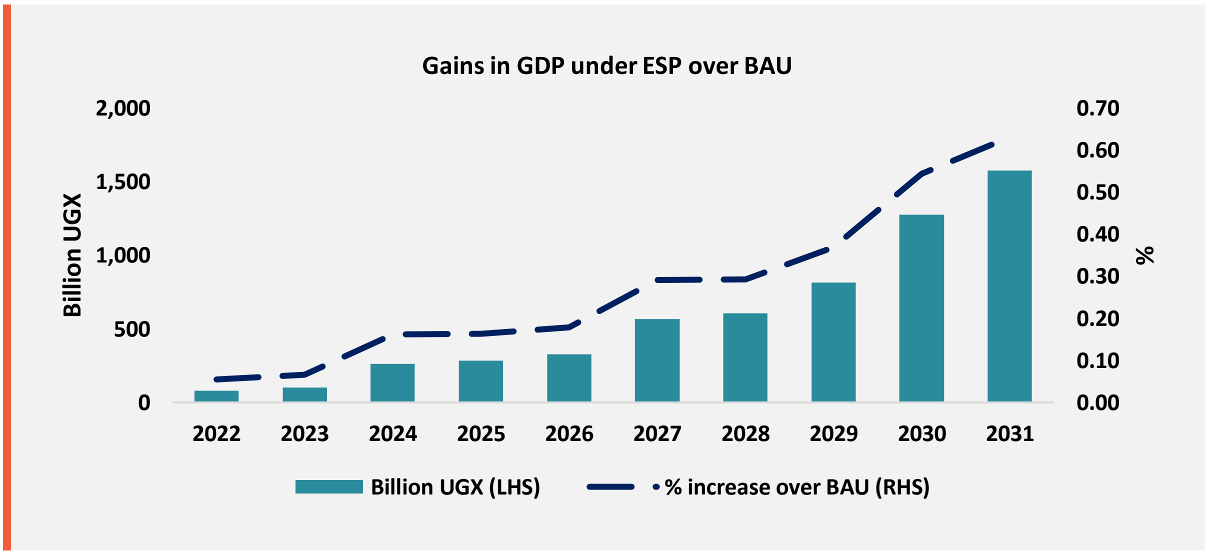
Figure ES 3: Headcount poverty under BAU and ESP, regions and rural/urban



Source: Authors' calculation

Along with impressive impacts of ESP interventions on poverty and inequality reduction, it also found to influence expansion of the national income. National income gain under ESP 1 over BAU 1 (or in FY 2021/22) has been simulated at UGX 79 billion generating a rise over BAU of GDP 0.05 per cent. The income gain increases to UGX 1,576 billion in FY 2030/31. This implies a growth rate of 0.63 per cent.

Figure ES 4: Gains in Market Price GDP under the ESP simulations over BAU scenarios



Source: Authors' calculation

The notion that social spending which was previously considered to be social welfare on a charitable basis is challenged by the findings of this simulation exercise. Simulation outcomes using SAM and DCGE models suggest salutary effects of ESP interventions in Uganda. The analysis presented here using macro-simulations confirms that social spending (such as ESP) is not a cost to the economy, but rather an investment. Furthermore, macro-economic modelling finds comparable advantage in terms of increased household consumption. This reinforces the widely acknowledged role of social protection and in particular cash transfers to beneficiary households, in supporting a consumption-led growth. On the basis of these positive effects, ESP interventions are justified.

1 Introduction and Background

Uganda is developing its 5- and 10-year National Development Plans (NDPs) in which it is expected that social protection will be included as a core area for expansion given the strong international evidence on its impacts on poverty, inequality, human development, employment and economic growth.[1] It is argued that expanding social protection in Uganda through the ESP programme is important not only for promoting economic growth and reducing poverty, but it will also help in addressing many other challenges which the country currently faces. For example, investing in social protection will likely improve Uganda's relatively low human capital stock which, compared to its neighbouring countries, is lagging behind with one of the lowest Human Development Indexes. As shown by the literature, countries that have invested in social security cash transfer schemes have benefited from a healthier and more qualified workforce.[2]

Within Uganda there is already good evidence of the positive impacts the Senior Citizens' Grant as had both at household and community levels. A recent study assessed the causal effects of the Expanding Social Protection Programme's (ESP) Senior Citizens Grant (SCG) on the wellbeing of older people and their immediate family.[3] Using microdata from the 2014 Census and recent household surveys (UDHS and UNHS), the analysis identified beneficiaries of the SCG and developed statistically comparable groups of older people to estimate the impact of the SCG on a number of outcomes measuring wellbeing. The analysis combined different methodologies to reinforce the findings. Using matching techniques and difference-in-differences, the study confirms that the SCG has been able to increase household expenditure and reduce monetary poverty among beneficiaries. On average, recipient households increased their expenditure by one-third and poverty levels have reduced by 19 percentage points. Positive effects were also observed among children living with SCG recipients. The study indicates that the SCG improved education outcomes of children, and reduced child labour. The study also found that the programme has had positive impacts on ownership of livestock, and it has also increased the supply of labour among working-age adults living with a beneficiary.

The ESP programme will also increase household resilience to major economic fluctuations and will place the government in a better position to weather negative shocks. Social security systems were fundamental in many countries during the 2008/09 global financial crisis, where a great number of people fell into poverty. Without these systems many more would have followed suit. In recent years, many Ugandans have faced a great deal of shocks including drought, high inflation, crop and livestock diseases[4], many of which could have been mitigated by social security systems. Furthermore, by following a lifecycle approach, the expansion of social protection will reduce the level of vulnerability across the course of many Ugandans' lives. Starting from the womb, through to childhood, working age and finally old age, people face many natural risks which make them vulnerable in different ways. A lifecycle social protection system will help to moderate such risks for all.

Investing in the ESP programme, Uganda may also strengthen its own social contract between the government and its citizens since social security reduces inequality and by following the lifecycle approach, the ESP programme would likely to strengthen its citizens' rights to social security.

However, it was also suggested by ESP that the positive case for investing in an expanded social protection system should continue to be made and more evidence is generated. Therefore, the

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[1] Hagen-Zanker, J., Bastagli, F., Harman, L., Barca, V., Sturge, G., & Schmidt, T. (2016). *Understanding the impact of cash transfers: the evidence*. ODI Briefing. London: Overseas Development Institute.
[2] Ibid.
[3] Gelders, B. & Athias, D. (2019). *Quantitative impact analysis of Uganda's Senior Citizens Grant.* Report prepared for the Expanding Social Protection (ESP) Programme.
[4] Uganda Bureau of Statistics (UBOS). (2018). Uganda National Household Survey 2016/2017. Kampala, Uganda; UBOS

Ministry of Gender, Labour and Social Development (MGLSD) and the Ministry of Finance, Planning and Economic Development (MFPED) have agreed to collaborate and, together, assess the potential economy-wide impacts of expanding social protection in Uganda, using a static Social Accountability Matrix (SAM) model based on MFPED's Social Accountability Matrix (SAM).

The analysis examines two areas:

1. Simulating the impacts of expanded social protection programmes on gross domestic product, GDP, household consumption and employment to provide evidence on the value of investing in social protection, compared with investments in other areas, such as infrastructure;
2. Simulating additional tax revenue gain through the growth impacts of social protection (as in point 1 above).

This analysis is also part of a broader set of work examining the financial sustainability of investing in social protection in Uganda, which is developing different options for investment (including a range of potential costs and types of schemes). The SAM modelling assignment works alongside and complements this broader work, engaging closely with the social protection experts working on the visioning proposals for ESP. The experts have provided support and advice on social protection to the consultant undertaking the SAM modelling, to enhance the quality of the model and to align it to proposals being developed for the expansion of the social protection system within the context of the NDPs.

The objective of this report is to present simulated impacts of the visioning proposals under ESP on national income and poverty headcount of household groups. The report is composed of five more sections. The methodology and data are discussed in Section 2. A brief description of the ESP Uganda SAM is presented in Section 3. Section 4 presents the ESP SAM model for 2017. The description of the Dynamic Computable General Equilibrium model is provided in Section 5. The design of ESP simulations and simulation results using the SAM model are reported in Section 6. The ESP simulation design and simulation outcomes of the DCGE model are reported in Section 7. Concluding observations are discussed in Section 8. Lastly, Section 9 includes all the Annexes.

2 Methodology and Data

Two sets of methodologies have been used to assess the economy-wide impacts of the visioning proposals under the ESP programme in Uganda. In the first stage, under a partial equilibrium approach, the proposed expansion of the ESP was reviewed and transfer values to different household groups were determined. In the second stage, the estimated expansion of ESP and its injection amounts were fed into a general equilibrium model to assess the economy-wide impacts across selected years from 2021 to 2031. The various methodological components, and the insights they provide, are summarised in the figure below.

Figure 1. Summary of methodologies

Methodology	Insights
Partial Equilibrium Approach	**Review of reports** **Review of data on ESP** **Determine ESP transfers to household groups**
Social Accounting Matrix Model	**Derive multipliers and linkages (backward and forward)** **Impacts on sectoral GDP** **Impacts on sectoral domestic output** **Impacts of household consumption** **Assess revenue implication**
Dynamic CGE model	**Impacts of sectoral prices and general price effects** **Effects on resource allocations through price changes** **Impacts of output, value added and demand components** **Short and long run impacts**
Poverty Model	**Poverty situation by location & representative households** **Impacts on urban and rural poverty** **Impacts on household level poverty**

2.1 Partial equilibrium approach

Under the partial equilibrium approach, a desk review of relevant materials was conducted to understand the current status of the social protection system in Uganda, and what has been proposed for the ESP programme up to fiscal year 2030/31. This review allowed us to determine the expected cash injection amounts by years, schemes and household groups. Three social protection schemes have been considered under the visioning proposals the ESP programme. These are: (i) a Child Benefit;

(ii) the expansion of the Senior Citizens Grant; and (iii) a Disability Benefit. The desk review also included the determination of the ESP transfer amounts in four selected intervention fiscal years: 2021/22, 2023/24, 2026/27, and 2030/31. Firstly, the number of beneficiaries was estimated for each year under each of the three selected schemes. In the second step, monthly transfer values were used along with the numbers of beneficiaries to determine the total transfer value for the three schemes and the four selected years using the following specification:

$$\boldsymbol{Total\ Transfer_i^t = beneficiary_i^t\ x\ transfer\ _i^t}$$

where, t = 2021/22, 2023/24, 2026/27 or 2030/31; and i = Child Benefit, Senior Citizens Grant or Disability Benefit.

Once the total transfer values of the proposed schemes in the ESP programme were determined for each year, the amounts were distributed to the 40 household groups using the following specification:

$$\boldsymbol{Total\ Transfer_i^t(h) = \lambda_i^t(h)\ x\ Total\ Transfer\ _i^t}$$

where, h = 40 household groups by regions and age cohorts; and λ is eligibility criteria.

2.2 Economy-wide Approach

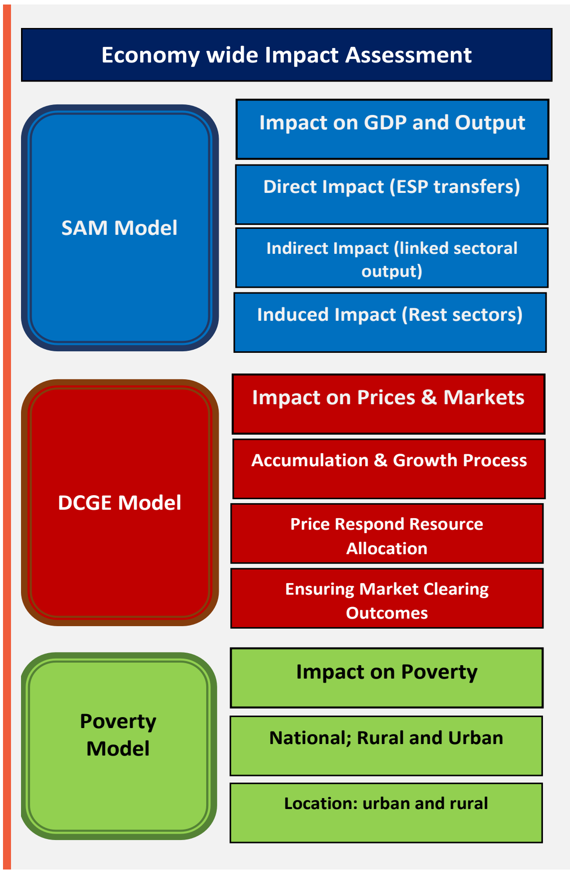
In order to meet the requirement of the current study, the original 2017 SAM has been modified. The review of the structure of the 2017 SAM was undertaken in collaboration with MFPED. It was agreed that the current structure – especially household classification – is not suitable for simulating the proposals under ESP from 2021 through to 2031. Therefore, the following adjustments to the original SAM have been agreed:

- Reclassify the 32 household groups which were based on region (Central, Western, Eastern, and Northern), location (rural and urban) and income quartile. It was agreed that the reclassification should be based on region (Central, Western, Easter, and Northern), location (rural and urban) and age of household members (more specifically, early childhood - 0 to 4 ages; school age - 5 to 14; youth - 15 to 29; working group - 30 to 64; and elderly - 65 and above);
- Aggregate the 186 activities into 32 activities and aggregate the 186 commodities into 32 commodities – in line with the classification adopted in the national accounts;
- Aggregate the 16 labour factors into 8 labour factors. However, the capital account has only one classification.

As a result of the reclassification of the original SAM accounts, the ESP SAM is now composed of 129 accounts, which is significantly less than the original figure of 435 accounts.

The economy-wide impact estimates are based on three inter-related frameworks (Figure 2):

Figure 2. Summary of the economy-wide methodologies



(i) A Social Accounting Matrix (SAM) based multiplier model which captures the effects on domestic outputs, value added, and household consumption as a result of the proposed ESP expansion. It also captures direct, indirect and induced impacts using the interdependence or linkages of activities and commodities.

(ii) A Dynamic Computable General Equilibrium (DCGE)[5] model calibrated according to the ESP SAM and which describes the accumulation of factors and their influence on the process of growth in each year of the intervention period. The DCGE model also captures price and resource allocation implications through the inter-dependence system.

(iii) A poverty model to assess poverty impacts of ESP injections. The household income or consumption outcomes simulated in the SAM and DCGE models are linked to the poverty model to assess poverty implications.

[5] In this report, the simulation results of the DCGE model have not been incorporated. They will be included in the report on the DCGE model.

2.3 Poverty Module

In order to simulate the impacts on poverty and inequality, microdata from the 2016/17 UNHS was used to distribute the estimated consumption gains from business-as-usual (BAU) as well as ESP derived from the SAM and DCGE models. Within each of the 40 region and household classification groups, the total gain in consumption is equally divided between all households. The assumption here is that eligible and ineligible households for the programmes benefit equally from the expansion in social protection, hence, gains in consumption are not distinguished between direct and indirect gains from expansion.

3 Description of the ESP Uganda SAM

This section describes the delineation of the accounts of the ESP SAM and provides an analysis of the key features of the production account, factor account and household account.

3.1 ESP SAM Accounts

The account descriptions of the 2017 ESP SAM are shown below.

Table 1: Description of ESP SAM accounts

SAM Accounts	Detailed account classification
Activities (32)	
	Cash crops, Food crops, Livestock, Forestry, Fishing (5)
	Mining & quarrying, Processed Food, Beverage and Tobacco, Textile, Furniture, Chemical Product, Plastic, Cement, Metal, Other Manufacturing, Electricity, Water, Construction (13)
	Trade and Repairs, Transportation and Storage, Accommodation and Food Service Activities, Information and Communication, Financial and Insurance Activities, Real Estate Activities, Professional, Scientific and Technical Activities, Administrative and Support Service Activities, Public Administration, Education, Human Health and Social Work Activities, Arts-Entertainment and Recreation, Other Service Activities, Activities of Households as Employers (14)
Commodities (32)	
	Cash crops, Food crops, Livestock, Forestry, Fishing (6)
	Mining & quarrying, Processed Food, Beverage and Tobacco, Textile, Furniture, Chemical Product, Plastic, Cement, Metal, Other Manufacturing, Electricity, Water, Construction (13)
	Trade and Repairs, Transportation and Storage, Accommodation and Food Service Activities, Information and Communication, Financial and Insurance Activities, Real Estate Activities, Professional, Scientific and Technical Activities, Administrative and Support Service Activities, Public Administration, Education, Human Health and Social Work Activities, Arts-Entertainment and Recreation, Other Service Activities, Activities of Households as Employers (14)
Factors of Production (9)	
	Labour factor (08): Unskilled Rural, Unskilled Urban, Semi-skilled Rural, Semi-skilled Urban, Skilled Rural, Skilled Urban, High skilled Rural, High skilled Urban;
	Capital factor (1): Capital
Institutions (47)	
	Household (40): Central Rural Ag04, Central Rural Ag514, Central Rural Ag1529, Central Rural Ag3064, Central Rural Ag65+, Central Urban Ag04, Central Urban Ag514, Central Urban Ag1529, Central Urban Ag3064, Central Urban Ag65+; Eastern Rural Ag04, Eastern Rural Ag514, Eastern Rural Ag1529, Eastern Rural Ag3064, Eastern Rural Ag65+, Eastern Urban Ag04, Eastern Urban Ag514, Eastern Urban Ag1529, Eastern Urban Ag3064, Eastern Urban Ag65+; Northern Rural Ag04, Northern Rural Ag514, Northern Rural Ag1529, Northern Rural Ag3064, Northern Rural Ag65+, Northern Urban Ag04, Northern Urban Ag514, Northern Urban Ag1529, Northern Urban Ag3064, Northern Urban Ag65+; Western Rural Ag04, Western Rural Ag514, Western Rural Ag1529, Western Rural Ag3064, Western Rural Ag65+, Western Urban Ag04, Western Urban Ag514, Western Urban Ag1529, Western Urban Ag3064, Western Urban Ag65+
	NPISH
	Enterprises (02)
	Government
	Rest of the World
	Savings or Gross fixed capital and Inventories (02)

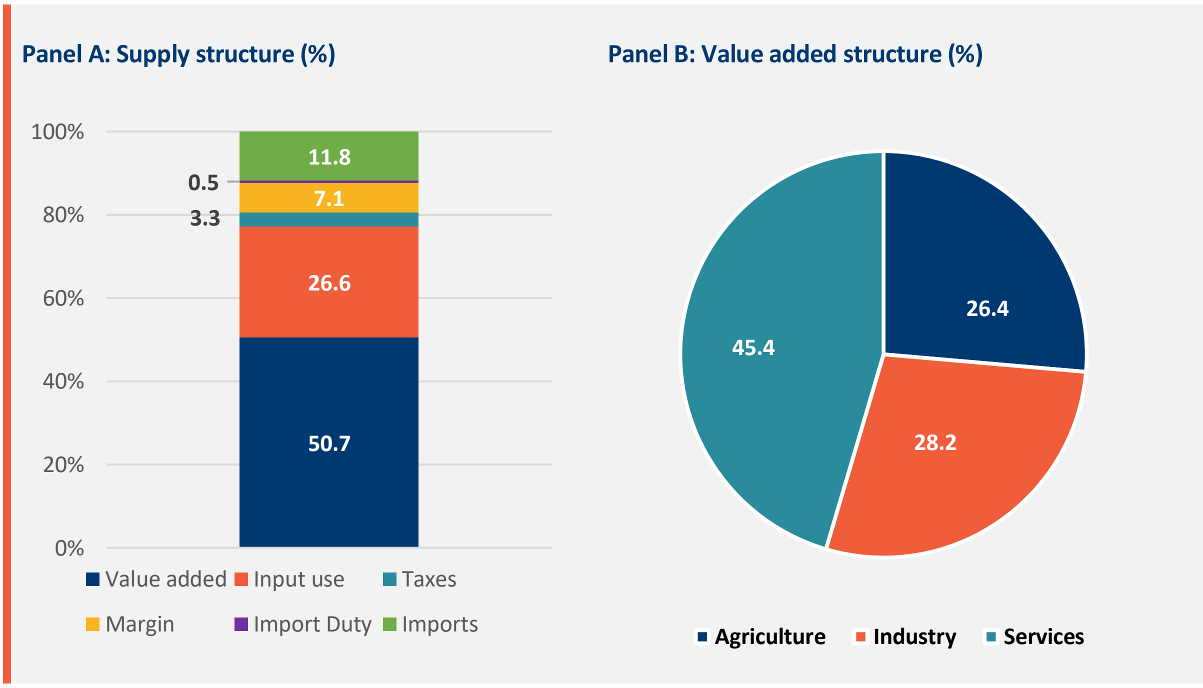
Source: 2017 ESP SAM

3.2 Key Features of ESP SAM

3.2.1 Production Account

Supply structure is presented in Panel A of Figure 3. The value-added share is the highest at 51 per cent. The share of input use in total supply is 27 per cent. Margins (trade and transport together) along with taxes constitute 10.4 per cent of the total supply. Thus, domestic supply is more than 88 per cent of total supply. In 2017, the Ugandan economy relied on imports for around 12 per cent of the total supply. The value-added (or economic) structure is captured in Panel B. It shows overwhelming dominance of services, and accounts for 45.4 per cent of total value-added in 2017. The contribution of industry is 28.2 per cent of the total value added in 2017. Agriculture closely follows the industry with a share of 26.4 per cent of total value-added.

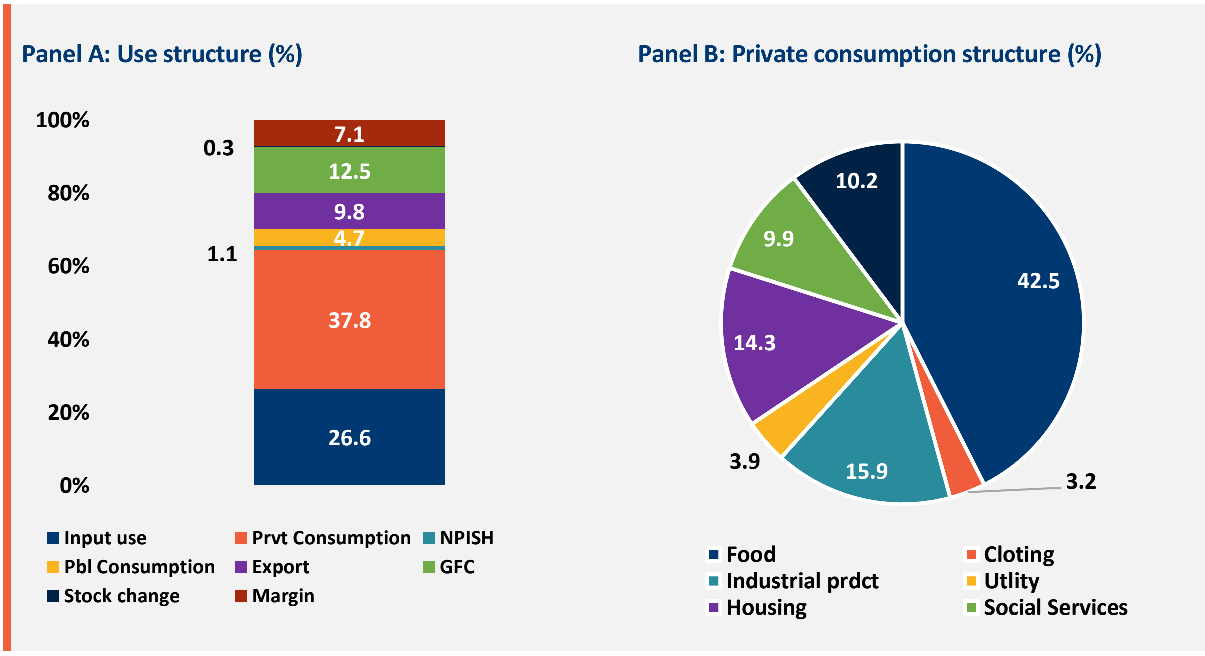
Figure 3: Supply structure (per cent)



Source: 2017 ESP SAM

Total use is composed of intermediate use and final use. The use structure is presented in Panel A of Figure 4. The share of intermediate use is 27 per cent of total, and, the share of the final use is 73 per cent. As expected, private consumption is the single largest component among all the use categories. The share of private consumption in total use is 37.8 per cent and, in total, final use the share increases to 51.4 per cent. The share of investment in total use is 12.5 per cent. The private consumption structure is provided in Panel B. It shows overwhelming dominance of the food items with 42.5 per cent in 2017. Household spend 15.9 per cent on industrial products in 2017. The shares of housing and social services in total private consumption expenditure are 14.3 per cent and 9.9 per cent respectively.

Figure 4: Use structure (per cent)

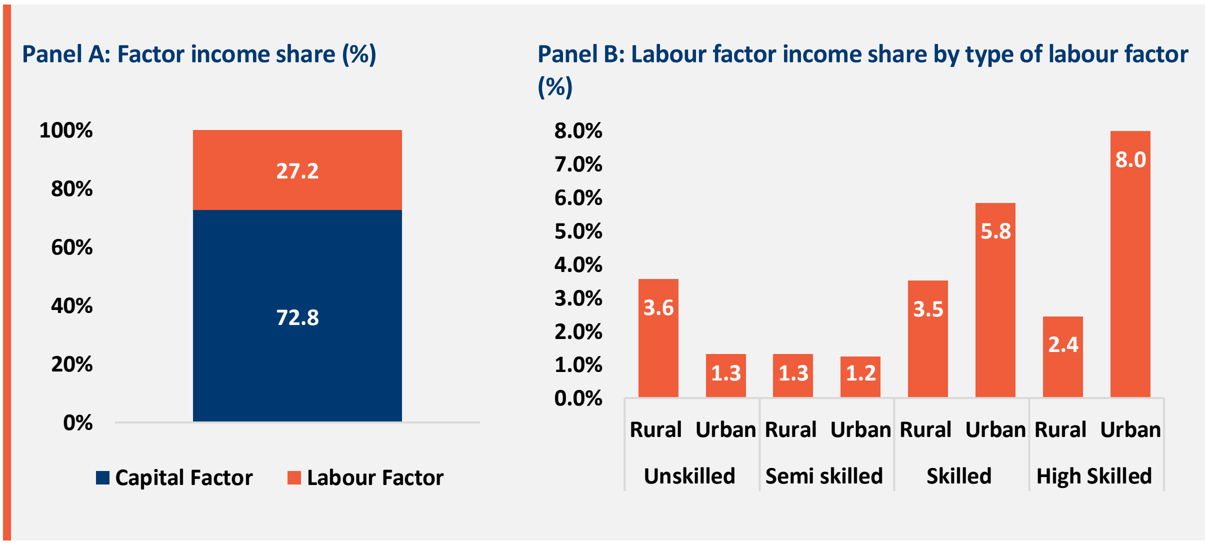


Source: 2017 ESP SAM

3.2.2 Factor Account

In the 2017 ESP SAM, the factor market has been represented by four types of labour, classified by skill levels – Unskilled labour; Semiskilled labour, Skilled and high Skilled labour. Capital factor which is represented by one category includes land as well as mixed factors (i.e. mostly self-employed groups who combined capital and their own labour in their production). Panel A of Figure 5 captures the factor income share between capital factor and labour factor. The share of capital is very high at 72.8 per cent. Thus, the share of labour factor is only 27.2 per cent. The distribution of the labour factor income by type of labour factor is shown in Panel B. High-skilled and skilled workers respond to the majority of the total labour factor income (19.7 per cent out of 27.2 per cent).

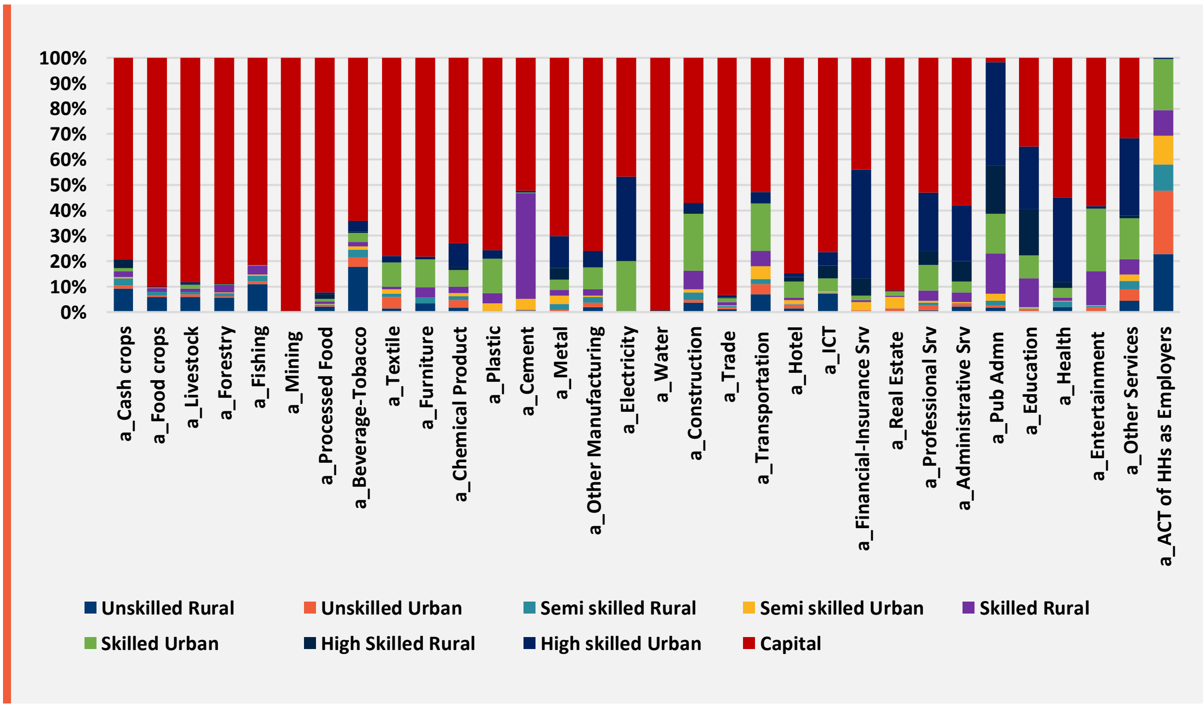
Figure 5: Factor income structure (per cent)



Source: 2017 ESP SAM

The factor intensities across the 32 activities by types of factors are shown in Figure 6. Uganda is overwhelmingly a capital-intensive country. In some activities, capital intensities, which includes agriculture and services, are as high as 90 per cent. The highest levels of capital intensities have been found in mining and water activities, but factor intensity patterns are diverse. While capital intensities are relatively high in heavy industries, activities such as public administration, education, other services and activities of households as employment have low capital intensities (or relatively high labour intensity), where capital intensity is less than 35 per cent. However, capital intensities of some of the activities seem unusual. Low capital intensities in Electricity (47 per cent) and Construction (57 per cent) seem unrealistic in contrast with very high capital intensities in water and trading activities (85 per cent).

Figure 6: Factor intensity structure (per cent)



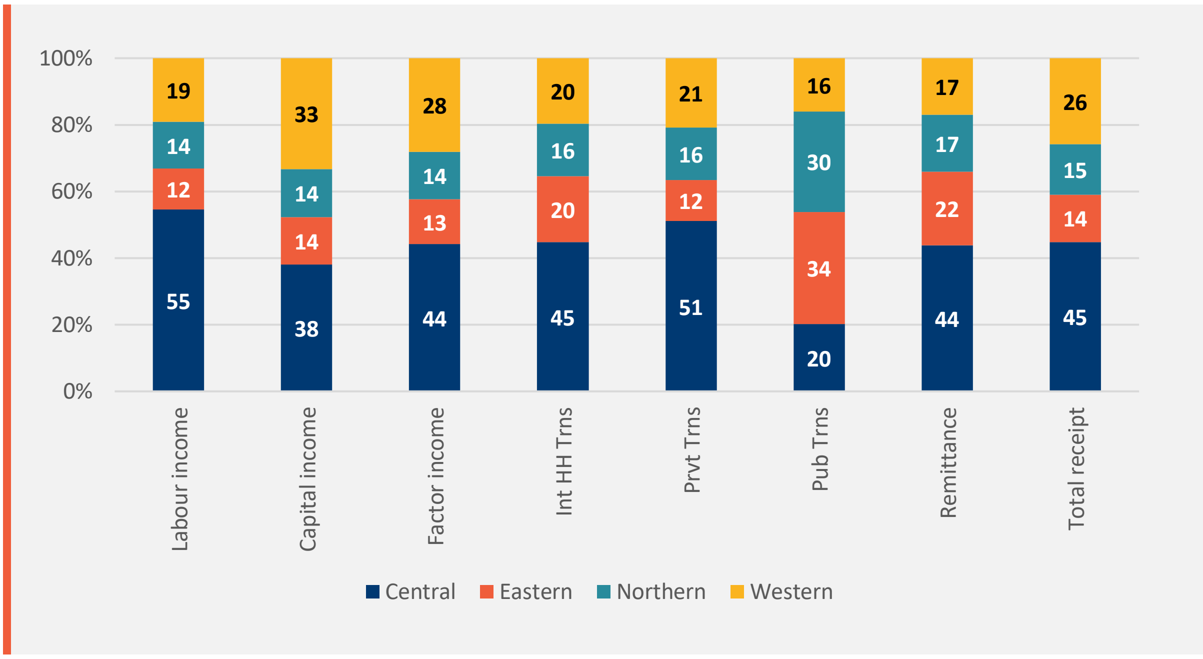
Source: 2017 ESP SAM

3.2.3 Household Receipt and Outlays Structure

There are 40 household groups classified to represent the household account in the 2017 ESP SAM. The classification has been based on region (four), location (two); and age groups (five). Household accounts are composed of various kind of receipts and outlays. The account is closed by savings in each of these forty household groups. The receipts, outlays and savings of household groups by the four administrative regions are presented below.

Household receipt structures by region and sources of receipt are shown in Figure 7. The richest and largest (by size) group is the central household group accounted for the largest shares of all but one income sources. Only 20 per cent of total government transfer is received by them. This group is followed by the Western household group with respect to receipts of income from various sources. Relatively poorer household groups are the Eastern and Northern household groups. Together, they account for more than 63 per cent of government transfers in 2017.

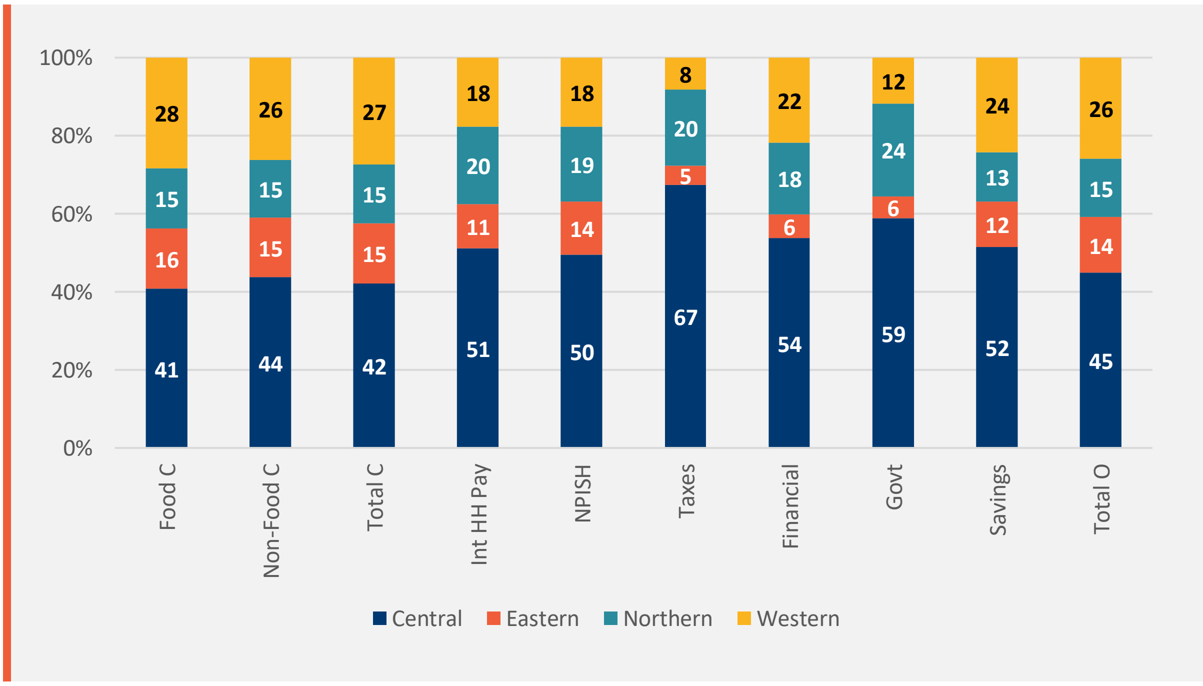
Figure 7: Household receipt structure (per cent)



Source: 2017 ESP SAM

Outlay structures of the four household groups by main expenditure items are shown in the figure below. The richest and largest household group – the Central household group accounts for the largest shares of all types of expenditures. Households in the Central region account for 45 per cent of the total outlay. This group is followed by the households in the Western region with respect to outlay on various expenditure items. Relatively poorer household groups are the Eastern and Northern household groups. Together, they account for around 40 per cent total outlay in 2017.

Figure 8: Household outlay structure (per cent)



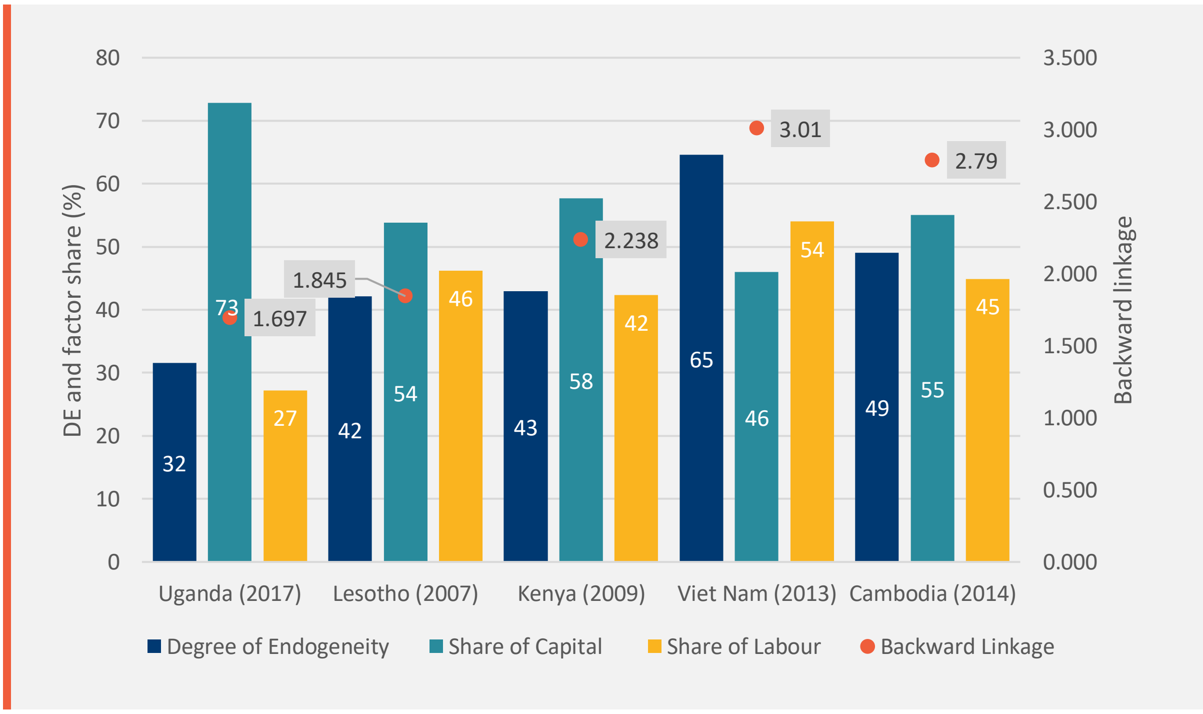
Source: 2017 ESP SAM

3.2.4 Comparison: Some key features of Uganda SAM with Other SAMs

Key features of the Uganda SAM, such as the average degree of endogeneity, average backward linkages, share of capital factor and labour factor in total value added (or GDP) have been compared with SAMs of Lesotho, Kenya, Viet Nam and Cambodia. Figure 9 presents these indicators across the five countries. The degree of endogeneity (DE) is lowest in Uganda (31.6 per cent) compared to the other four SAMs. It is usually envisaged that the higher the DE, the higher is the integration to the domestic economy – leading to higher backward linkage and value addition by the linked activities. The highest DE is found in Viet Nam (64.6 per cent) in 2013. As a result of a low DE in Uganda, backward linkage (BL) is also lowest (1. 697) in Uganda. Low DE and BL may constrain economic expansion – expected with injection such as ESP (or any other exogenous injection).

Another important feature of the Uganda SAM is the very high share of capita factor income (72.8 per cent) in total factor income or value added (or GDP). It suggests that 73 per cent of additional income accrue to capital factor leaving only 28 per cent to labour factor. This may suggest that current primary income distribution in Uganda is not pro-poor or inclusive compared to SAMs of the other four countries.

Figure 9: Comparison of Uganda SAM features with some other SAMs (per cent)



Source: 2017 ESP SAM, 2007 Lesotho SAM, 2009 Kenya SAM, 2013 Viet Nam SAM, and 2014 Cambodia SAM

4 ESP Uganda SAM Model

4.1 Methodology of SAM Model

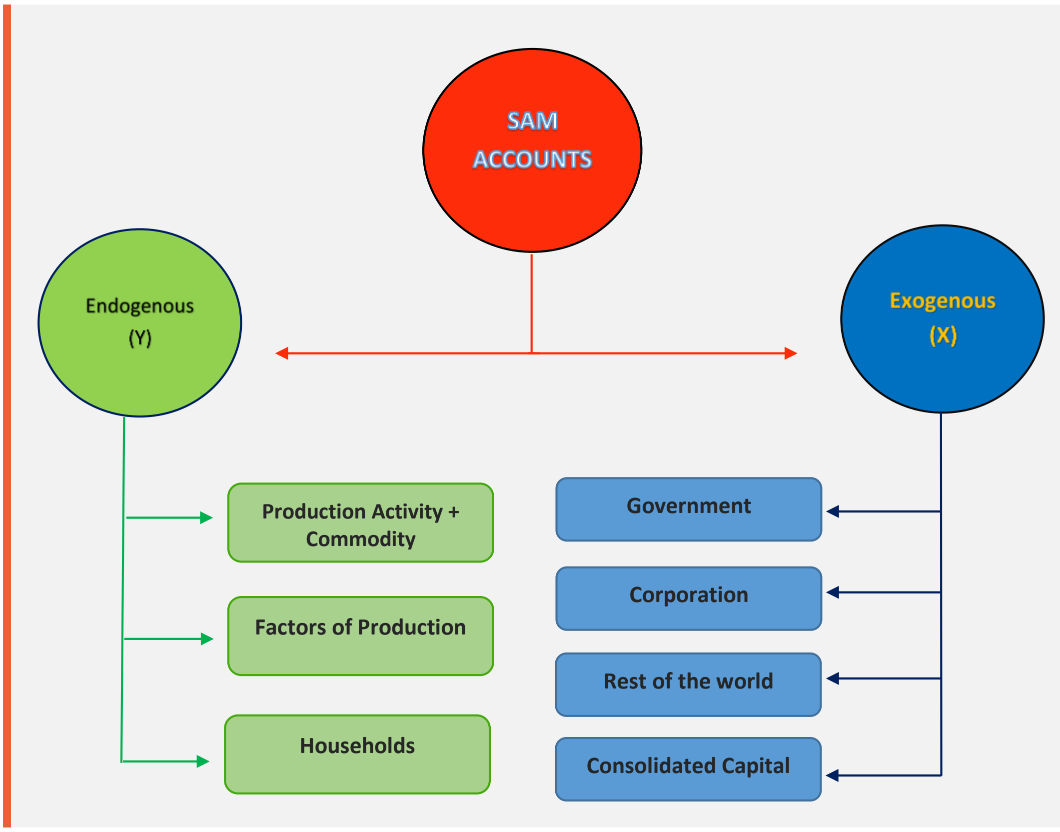
In a narrower sense, a SAM is a systematic data and classification system. As a data framework, SAM is a snapshot of a country at a given point in time.[6] A particular innovation of the SAM approach is to bring together macroeconomic data (such as national accounts) and microeconomic data (such as household surveys and labour force surveys) within a consistent framework. It aims to provide a comprehensive picture of the structure of the economy. A SAM is a generalization of the production relations, and extends this information beyond the structure of production to include: i) the distribution of value-added to institutions generated by production activities; ii) formation of household and institutional income; iii) the pattern of consumption, savings and investment; iv) government revenue collection and associated expenditures and transactions; and v) the role of the foreign sector in the formation of additional incomes for household and institutions. SAMs usually serve two basic purposes: a) as a comprehensive and consistent data system for descriptive analysis of the structure of the economy and b) as a basis for macroeconomic modelling.[7]

The move from a SAM data framework to a SAM model (also known as 'multiplier framework') requires decomposing the SAM accounts into 'exogenous' and 'endogenous'. Generally, accounts intended to be used as policy instruments (for example, government expenditure including social protection, investment and exports) are made exogenous, and accounts specified as objectives or targets must be made endogenous (for example, output, commodity demand, factor return, and household income or expenditure). For any given injection into the exogenous accounts of the SAM, influence is transmitted through the interdependent SAM system among the endogenous accounts. The interwoven nature of the system implies that the incomes of factors, households and production are all derived from exogenous injections into the economy via a multiplier process. The multiplier process is developed here on the assumption that when an endogenous income account receives an exogenous expenditure injection, it spends it in the same proportions as shown in the matrix of average propensities to spend (APS). The elements of the APS matrix are calculated by dividing each cell by the sum total of its corresponding column (please see Annex 1 for details on SAM based modelling).

[6] Pyatt, G., & Thorbecke, E. (1976). Planning techniques for a better future; a summary of a research project on planning for growth, redistribution and employment. Geneva, ILO

[7] There are three widely used approaches to capture economy wide impacts: (i) fixed price multiplier model based on an input-output table or matrix (IOM); (ii) fixed price multiplier model using a social accounting matrix (SAM) – which is a super set of IOM encompassing activities, commodities, factors of production along with institution; and (iii) flex price computable general equilibrium (CGE) model – invoking markets (e.g. product market and labour market etc.), behavioural specifications of all agents (e.g. producers and consumers etc.) and closure rules (e.g. defining how the accounts are balanced).

Figure 10: Endogenous and Exogenous accounts of a SAM model



Source: Authors' own specification

4.2 Conversion of the ESP SAM into a SAM Model

The ESP SAM is composed of 127 accounts – 32 accounts for activities; 32 accounts for commodities; factor account composed of 9 accounts; 40 accounts for households; and, other accounts consists of 14 accounts. To convert the ESP SAM into a SAM model, these 127 accounts are decomposed into 'exogenous' and 'endogenous' accounts. Following the general practice, endogenous accounts include activity, commodity, factor and household (i.e. four endogenous accounts). Exogenous accounts consist of government, enterprises, rest of the world and investment accounts. The endogenous and exogenous accounts of the ESP SAM model is provided in the table below.

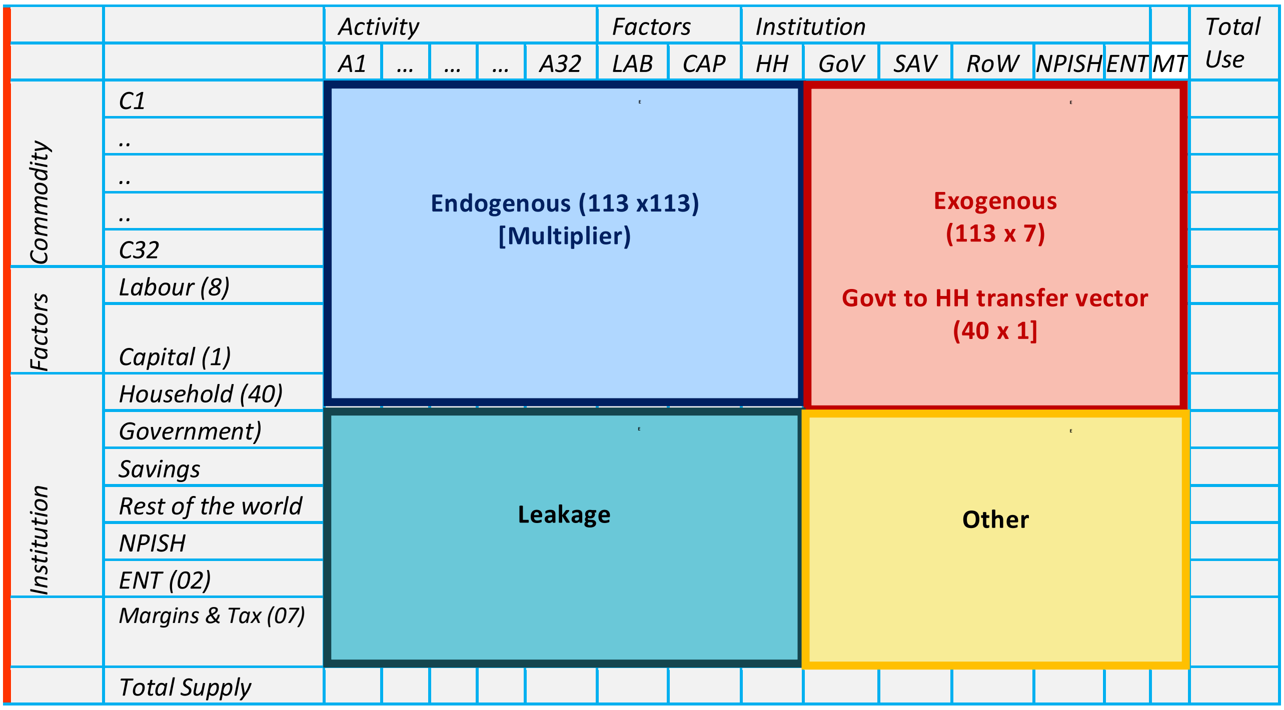
Table 2: Endogenous and exogenous accounts of ESP SAM model

Endogenous Accounts		Exogenous Accounts		
Description	**Number**	**Description**	**Number**	**Policy Instruments**
Activity	32			
Commodity	32	Government	1	Expenditure and Investment
Factor	9	Enterprise	2	Transfers
		Rest of the World	1	Export demand and remittance
Household	40	Investment	2	Transfers (ESP)
		NPISH	1	Transfers
		Margin and Taxes	7	
Total	**113**		**14**	

Source: Authors' own specification

More specifically, the ESP SAM for 2017 has been converted into a SAM multiplier model to determine the economy-wide (i.e. GDP) impacts of the proposed cash transfer schemes under the ESP. By convention, a SAM needs to be decomposed into four blocks to specify the SAM model (as specified in the figure below).

Figure 11: ESP SAM model specification



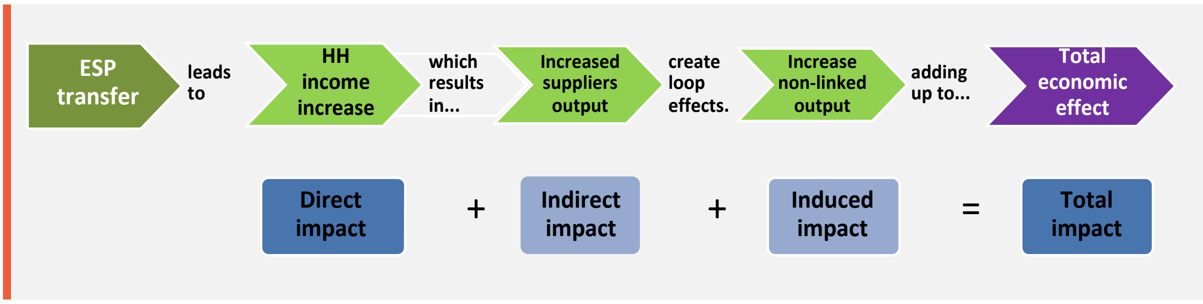
Source: Authors' own specification

Government interventions such as social protection programmes which aim to smooth household consumption are expected to have an impact on the economy through different channels:

> **(a) Direct effects**: Government transfers to households would increase their income. An increase in income leads to higher consumption of goods and services of their choice. The income and consumption increase (or change) of households constitute *direct effects* of social protection intervention.
>
> **(b) Indirect effects**: An increase in household income may likely trigger an additional demand for goods and services – requiring higher outputs and more employment of factors (labour and capital). The additional output and employment created in the supply chain (through backward linkages) are the *indirect effects*.
>
> **(c) Induced effects**: The additional workers employed by the expansion of the sectors supplying to it (through indirect effects) now spend more - which generates additional production and employment in various other sectors throughout the economy, creating a multiplier of further demand. This spill over effect is called an *induced effect*.

The SAM methodology presented in this paper estimates the direct, indirect, and induced effects from ESP intervention through the households (HH). The chain effects of the direct, indirect and induced impacts are described in the figure below.

Figure 12. Chain effects



For any given injection into the exogenous accounts of the SAM, especially transfers to the household groups, influence is transmitted through the interdependent ESP SAM system among the endogenous accounts. The interwoven nature of the system ensures that the incomes of factors, households and production are all generated from exogenous injections into the Ugandan economy via a multiplier process (Table 3)

Table 3: Description of the endogenous and exogenous accounts and the multiplier effects

Endogenous (y)	*Exogenous (x)*
The activity (gross output multipliers), indicates the total effect on the sectoral gross output of a unit-income increase in a given account, *i* in the SAM, and is obtained via the association with the commodity production activity account *i*.	
The consumption commodity multipliers, which indicates the total effect on the sectoral commodity output of a unit-income increase in a given account *i* in the SAM, is obtained by adding the associated commodity elements in the matrix along the column for account *i*.	Intervention into through activities (x = i + g + e), where i= GFC + ST (GFCF) Exports (e) Government Expenditure (g) *Investment Demand (i)* Inventory Demand (i)
The value-added, or GDP multiplier, giving the total increase in GDP resulting from the same unit-income injection, is derived by summing up the factor-payment elements along account *i*'s column.	
Household income multiplier shows the total effect on household and enterprise income and is obtained by adding the elements for the household groups along the account i column.	Intervention via Households (x = r + gt + ct), where Remittance (r) *Government Transfers (gt)* Enterprise Transfers (ct)

The multiplier analysis using the SAM framework helps to understand further the linkages between the different sectors and the institutional agents at work within the economy. Accounting multipliers have been calculated according to the standard formula for accounting (impact) multipliers, as follows:

$$\boldsymbol{y} = \boldsymbol{A}\,\boldsymbol{y} + \boldsymbol{x} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{x} = \boldsymbol{M_a}\,\boldsymbol{x}$$

where:

- $\boldsymbol{y}$ is a vector of endogenous variables (which is 124 according to 2017 SAM with all accounts showing number with no zero)
- $\boldsymbol{x}$ is a vector of exogenous variables (which is also 124 according to 2017 SAM with lots of zero suggesting that policy options are not large)

- $\boldsymbol{A}$ is the matrix of average expenditures propensities for endogenous accounts, and $\boldsymbol{M_a} = (\boldsymbol{I} - \boldsymbol{A})^{-1}$ is a matrix of aggregate accounting multipliers (also known as generalized Leontief inverse).

The present multiplier framework has four endogenous accounts, and, hence, for each account in the SAM we can calculate four types of multiplier measures due to changes in any one of the various exogenous accounts.

The economy-wide impacts of the transfers (ESP) have been examined by changing the total exogenous injection vector, especially government – household account. That is, the total exogenous account is manipulated to estimate their effects on output (through an output multiplier), value-added or GDP (through the GDP multiplier), and household income (through household income multiplier) and commodity demand (via commodity multipliers).

5 Dynamic Computable General Equilibrium Model

In addition to the fixed price demand driven SAM model, a Dynamic Computable General Equilibrium (DGCE) model, based on the ESP SAM for Uganda for 2017, has been used to estimate macroeconomic implications of the ESP investment previously discussed. The reason for employing a DGCE model is due to the fact that a DGCE model is capable of capturing the growth effects of policy reforms. The inability of the static CGE models to account for growth effects make them inadequate for long-run analysis of economic policies. Static CGE models exclude accumulation effects and do not allow the study of the transition path of an economy where short-run policy impacts are likely to be different from those of the long-run. To overcome this limitation, a sequential dynamic CGE model is used, where these types of dynamics will not be the result of inter-temporal optimisation by economic agents. Instead, agents have myopic behaviour, and the model will be a series of static CGE models that are linked between periods, by updating procedures for exogenous and endogenous variables. Capital stock is updated endogenously with a capital accumulation equation, whereas population (and total labour supply) is updated exogenously between periods. Other variables such as public expenditure, transfers, technological change or debt accumulation are also updated over time. There are two major modules in the sequential DCGE model: a static module and a dynamic module with five blocks, which are detailed in Table 4.

Table 4: DCGE Blocks

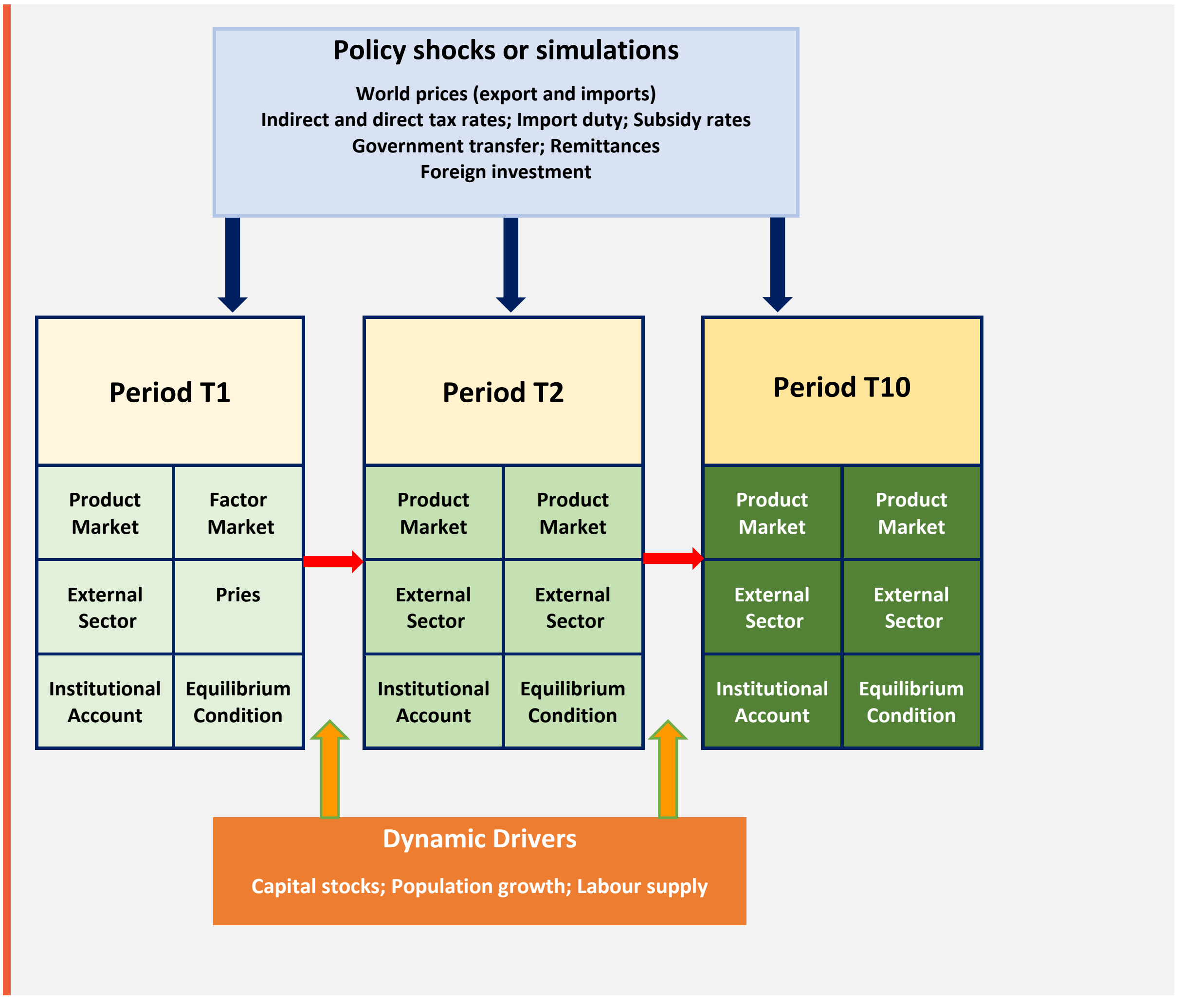
Main Model Blocks	Key Features
1. Production and Supply Production arrangements through the use of factors of production (i.e. labour and capital) and intermediate inputs are specified here.	A nested structure for production has been adopted. Sectoral output is a Leontief function of value added and total intermediate consumption. Value-added is represented by a CES function of capital and composite labour. The latter is also represented by a CES function of two labour categories: skilled labour and unskilled labour. Both labour categories are assumed to be fully mobile in the model.
2. Income and Expenditure Income generation of various institutions (household and government) and their expenditure patterns are specified in this block.	Households earn their income from production factors – labour and capital. They also receive dividends, intra-household transfers, government transfers and remittances. Household demand is represented by a linear expenditure system (LES) derived from the maximisation of a Stone-Geary utility function. Minimal consumption levels are calibrated by using guess-estimates of the income elasticity and the Frisch parameters. They also pay direct income tax to the government. Household savings are a fixed proportion of total disposal income. Government receives direct tax revenue from households and firms and indirect tax revenue on domestic and imported goods. Expenditure is allocated between the consumption of goods and services (including public wages) and transfers.
3. International Trade International trade with Rest of the World in the form of import from and export to is captured in this block.	Foreign and domestic goods are imperfect substitutes. This geographical differentiation is invoked by the standard Armington assumption with a constant elasticity of substitution function (CES) between imports and domestic goods. On the supply side, producers make an optimal distribution of their production between exports and domestic sales according to a constant elasticity of transformation (CET) function. Furthermore, a finitely elastic export demand function that expresses the limited power of the local producers on the world market has also been assumed. In order to

Main Model Blocks	Key Features
	increase their exports, local producers may decrease their free on board (FOB) prices.
4. Prices All types of prices including wages and returns to capital are defined in this block.	Prices are formed through the interaction of supply and demand. The nominal exchange rate is the numéraire in each period.
5. Equilibrium Condition Equilibrium conditions of the various markets; factors and as well as institutions are specified here.	General equilibrium is defined by the equality (in each period) between supply and demand of goods and factors and the investment-saving identity.

5.1 Static to Dynamic Transformation

The DCGE model is formulated as a static model that is solved sequentially over a certain period of time. The schematic description of static to dynamic transformation is shown below (Figure 13).

Figure 13: Schematic Description of Static to Dynamic Transformation



The model is homogenous in prices and calibrated in a way to generate a "steady state" path. In the baseline, all the variables are increasing, in level, at the same rate and the prices remain constant. The homogeneity test[8] generates the same shock on prices, and unchanged real values, along the counterfactual path. This method is used to facilitate welfare and poverty analysis since all prices remain constant along the business as usual (BAU) path.

However, it is important to note that, in contrast to the static CGE models, which make counterfactual analysis with respect to the base run[9] (generally the initial SAM); a DCGE model allows the economy to grow even in the absence of a shock. This scenario of the economy (without a shock) is termed as the business-as-usual (BAU) scenario. The counterfactual analysis of any simulation under the dynamic CGE model is, therefore, done with respect to this growth path. One of the salient features of the dynamic model is that it considers not only efficiency effects, as also present in the static models, but also accumulation effects. The sectoral accumulation effects are linked to the ratio between the rate of return to the capital stock and the cost of investment goods.

5.2 Key Drivers for the Dynamic Model

Accumulation of Capital: In every period, capital stock is updated with a capital accumulation equation. It is assumed that the stocks are measured at the beginning of the period and that their flows are measured at the end of the period. An investment demand function to determine how new investments will be distributed between the different sectors is also used. Investment is not by origin (product), but rather by sector of destination. The investment demand function is similar to the function proposed by Bourguignon et al. (1989), and Jung and Thorbecke (2003).[10] The capital accumulation rate (ratio of investment to capital stock) is increasing with respect to the ratio of the rate of return to capital and its user cost. The latter is equal to the dual price of investment times the sum of the depreciation rate and the exogenous real interest rate. The elasticity of the accumulation rate with respect to the ratio of return to capital and its user cost is assumed to be equal to case specific values (i.e. it may be any number such as 1.5; 2 or 3). By introducing investment by destination, the equality condition with total investment by origin in the SAM (Social Accounting Matrix) is maintained. Besides this, investment by destination is used to calibrate the sectoral capital stock in base run.

Endogenous Labour Supply: Total labour supply is an endogenous variable, although it is assumed to simply increase at the exogenous population growth rate.[11] It is worth noting that the minimal level of consumption in the LES function also increases (as do other nominal variables, like transfers) at the same rate. The exogenous dynamic updating of the model includes nominal variables (that are indexed), government savings and the current account balance. The equilibrium between total savings and total investment is reached by means of an adjustment variable introduced in the investment demand function. Moreover, the government budget equilibrium is met by a neutral tax adjustment. Descriptions of the static and dynamic modules of the model are presented in Annex 9.5.

[8] For example, a shock on the numéraire – the nominal exchange rate – with the "steady state" characteristics.

[9] Base run is similar to baseline or benchmark. According to the SAM model, the base run reproduces the values of SAM accounts. The simulation outcomes are then compared against the base run values.

[10] Bourguignon, F., W. H. Branson, and J. de Melo. 1989. "Macroeconomic Adjustment and Income Distribution: A Macro-Micro Simulation Model." OECD Technical Paper 1. Paris, and Jung, H. S., and E. Thorbecke. 2003. "The Impact of Public Education Expenditure on Human Capital, Growth, and Poverty in Tanzania and Zambia: A General Equilibrium Approach." Journal of Policy Modeling 25: 701–25.

[11] In static CGE model, labour supply is fixed and exogenous. But in a dynamic CGE model since the labour supply varies with population growth, it is made endogenous.

6 SAM Model Simulations: Design and Results

The estimated distribution of the total social protection transfer allocation in each year by the SAM classifications (household groups, regions and location) is derived from the distribution of programme age-eligible persons for the same classifications using household survey data. For example, the distribution of the total allocation of the Senior Citizens Grant (SCG) projected for 2020/21 by household groups, region and location follows the same distribution of older persons, 65 years and over, who are currently living in districts receiving the SCG. The distribution of eligible older persons by the same classifications is obtained from the 2017 Uganda National Household Survey. In the case of the Disability Benefit, the distribution of persons with disabilities by household groups in each region and location is defined by the 2016 Uganda Demographic Household Survey.[12] The table below provides the age criteria for each programme by fiscal year and the data sources used. When coverage is not universal, it is assumed that this does not impact the distribution of the allocation. The only exception is the SCG in 2020/21, where coverage is constrained to districts currently receiving the grant.

Table 5: Programme age criteria by fiscal year

Programme	Data	FY 2020/21	FY 2022/23	FY 2025/26	FY 2029/2030
Child Benefit	2016/17 UNHS	No programme	No programme	Children under 5 years	Children under 10 years
Disability Benefit	2016 UDHS	No programme	Persons with disabilities aged between 0 and 17	Persons with disabilities under 64 years	Persons with disabilities under 64 years
Senior Citizens Grant	2016/17 UNHS	Older persons 65 years and over	Older persons 65 years and over	Older persons 65 years and over	Older persons 65 years and over

6.1 ESP Simulation Design

The following simulations have been carried out.

Business as Usual (BAU): A business as Usual scenario[13] is generated on the assumption that there is no expansion of ESP or other interventions in the Ugandan economy (i.e. in addition to the autonomous growth of the social protection transfer amounts). The exogenous account of the SAM model is set up in such a way that it reflects what is needed to change in all elements of the exogenous account – to exactly match the nominal GDP values projected[14] for fiscal years 2021/22, 2023/24,

[12] A person with disability is defined as a person who has 'a lot of difficulty' in doing or is 'unable to do' in at least one of the six functional domains of the disability module in the UDHS.

[13] In this exercise, BAU scenarios or final demand (BAU^F) may also be the policy scenarios of Uganda as the projected growth rates in FY 2022, FY 2024, FY 2027 and FY 2031 are higher than those would have attained under pure BAU scenarios. Mathematically, BAU intervention or exogenous (BAU^E) values are derived by specification: $BAU^E_{(113 \times 1)} = A_{(113 \times 113)} \times BAU^F_{(113 \times 1)}$.

[14] Nominal GDP has been projected using information of National Budget Framework: FY 2019/20 to FY 2023/24 prepared by MFPED.

2026/27, and 2030/31. Generating the BAU scenarios to exactly match the projected values of output, commodity demand, GDP and household consumption for the four selected fiscal years are important since they set the benchmark to examine the impact of various simulations. The projected benchmark values for the BAU scenarios are presented in the figure below.

Figure 14. BAU scenarios and projected benchmark values, by selected fiscal years

2021/22	2023/24	2026/27	2030/31
41,715	48,873	68,581	108,522
109	124	244	244
89,182	103,445	142,645	218,895
131,006	152,441	211,391	327,661

Legend:

- refer to non-zero production elements (pink)
- denote non-zero factor elements (green)
- refer to non-zero household elements (blue)
- denote total intervention amounts (orange)

Note: All intervention values are in billion UGX

Expanding Social Protection (ESP): Expansion of the social protection in Uganda has been planned to realize over FY 2021/22 and FY 2030/31 period focusing on the Senior Citizens Grant (SCG); child benefit (CB); and Disability benefit. In simulating the expansion of social protection, ESP interventions (given to the households) are added to the BAU simulations. Figure 15 presents the intervention values under the ESP scenarios are presented.

Figure 15. ESP scenarios (BAU + intervention), by selected fiscal years

2021/22		2023/24		2026/27		2030/31	
BAU	+ Intervention	BAU	+ Intervention	BAU	+ Intervention	BAU	+ Intervention
41,715	0	48,873	0	68,581	0	108,522	0
109	0	124	0	244	0	244	0
89,182	161.2	103,445	747.9	142,645	1,901.4	218,895	6,265.8
131,006	131,167	152,441	153,189	211,391	213,292	327,661	333,927

Legend:

- refer to non-zero production elements (pink)
- denote non-zero factor elements (green)
- refer to non-zero household elements (blue)
- denote total intervention amounts (orange)

Note: All intervention values are in billion UGX

The distribution of the total intervention values by representative households under the ESP scenarios are provided in the table below.

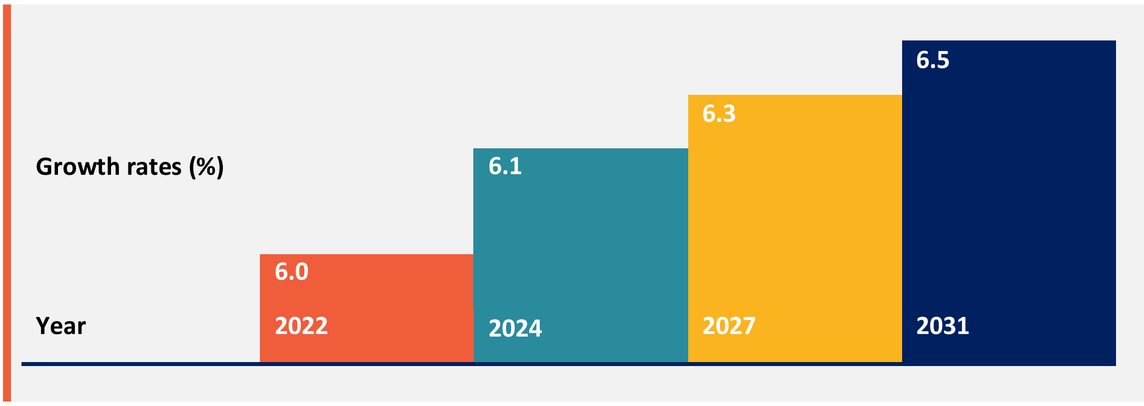
Table 6: Total intervention values under the ESP scenarios, by selected fiscal years and household groups (Billion UGX)

Representative Households	2021/22	2023/24	2026/27	2030/31
Central Rural Age 0-4 yrs	3.1	11.7	28.5	94.9
Central Rural Age 5-14 yrs	4.8	23.9	59.3	172.3
Central Rural Age 15-29 yrs	6.3	29.0	79.2	227.8
Central Rural Age 30-64 yrs	5.3	24.5	80.9	270.6
Central Rural Age 65+ yrs	4.8	22.5	61.2	219.2
Central Urban Age 0-4 yrs	0.5	1.9	5.8	21.5
Central Urban Age 5-14 yrs	1.5	5.5	12.4	50.4
Central Urban Age 15-29 yrs	1.3	4.5	17.7	94.3
Central Urban Age 30-64 yrs	1.3	6.7	34.6	169.3
Central Urban Age 65+ yrs	4.1	23.0	88.4	360.1
Eastern Rural Age 0-4 yrs	11.6	47.3	121.2	436.3
Eastern Rural Age 5-14 yrs	10.5	48.4	126.5	405.6
Eastern Rural Age 15-29 yrs	9.1	41.8	91.2	283.0
Eastern Rural Age 30-64 yrs	8.7	36.7	70.1	184.3
Eastern Rural Age 65+ yrs	4.1	16.2	26.9	70.3
Eastern Urban Age 0-4 yrs	1.3	6.0	11.3	39.8
Eastern Urban Age 5-14 yrs	1.2	4.3	9.0	37.6
Eastern Urban Age 15-29 yrs	0.7	2.5	7.9	39.2
Eastern Urban Age 30-64 yrs	1.2	4.7	13.2	45.6
Eastern Urban Age 65+ yrs	1.2	4.6	15.0	44.8
Northern Rural Age 0-4 yrs	7.7	42.1	115.8	368.6
Northern Rural Age 5-14 yrs	6.9	33.3	74.6	262.4
Northern Rural Age 15-29 yrs	5.9	24.9	53.4	204.6
Northern Rural Age 30-64 yrs	5.7	24.0	47.4	157.9
Northern Rural Age 65+ yrs	3.4	13.1	25.8	87.1
Northern Urban Age 0-4 yrs	0.4	3.2	8.3	25.5
Northern Urban Age 5-14 yrs	0.6	2.9	7.1	25.3
Northern Urban Age 15-29 yrs	1.1	4.5	9.8	35.4
Northern Urban Age 30-64 yrs	0.7	2.9	8.1	39.1
Northern Urban Age 65+ yrs	1.2	5.7	14.9	54.9
Western Rural Age 0-4 yrs	2.7	14.7	39.5	143.5
Western Rural Age 5-14 yrs	5.8	38.0	100.4	278.7
Western Rural Age 15-29 yrs	9.0	46.7	131.8	363.1
Western Rural Age 30-64 yrs	9.7	46.9	118.6	367.1
Western Rural Age 65+ yrs	11.1	42.2	86.9	274.4
Western Urban Age 0-4 yrs	0.6	2.8	5.9	17.0
Western Urban Age 5-14 yrs	1.4	6.2	13.0	42.1
Western Urban Age 15-29 yrs	1.7	9.8	24.0	62.1
Western Urban Age 30-64 yrs	1.2	7.5	23.8	83.8
Western Urban Age 65+ yrs	1.6	11.2	31.8	106.3
Total	161.25	747.91	1,901.37	6,265.81

6.2 Generation of BAU scenarios for 2021/22, 2023/24, 2026/27 and 2030/31

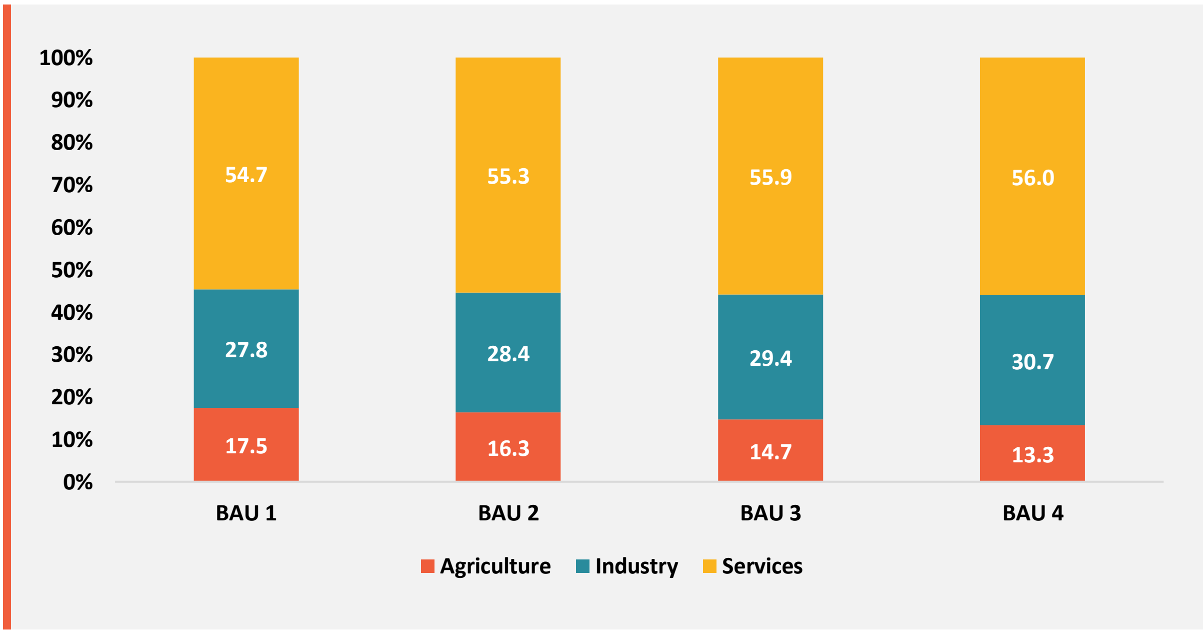
Using the SAM model, the BAU scenarios for each of the selected fiscal years have been generated assuming that there is no additional social protection transfer or intervention into the Ugandan economy. Since ESP has been set up for four specific years, four BAU scenarios (i.e. for 2021/22; 2023/24; 2026/27 and 2030/31) are also generated. The sectoral GDP, gross domestic output, and household consumption are estimated under the BAU scenarios. The overall real GDP growth rates under the BAU scenarios are presented in figure below.

Figure 16: Real GDP growth rates under BAU scenario, by selected fiscal years (%)



Estimated economic structures as contained in the BAU scenarios are presented in Figure 17. It captures falling shares of agriculture in favour of industry and services.

Figure 17: Economic structure under BAU scenarios, by selected fiscal years (%)



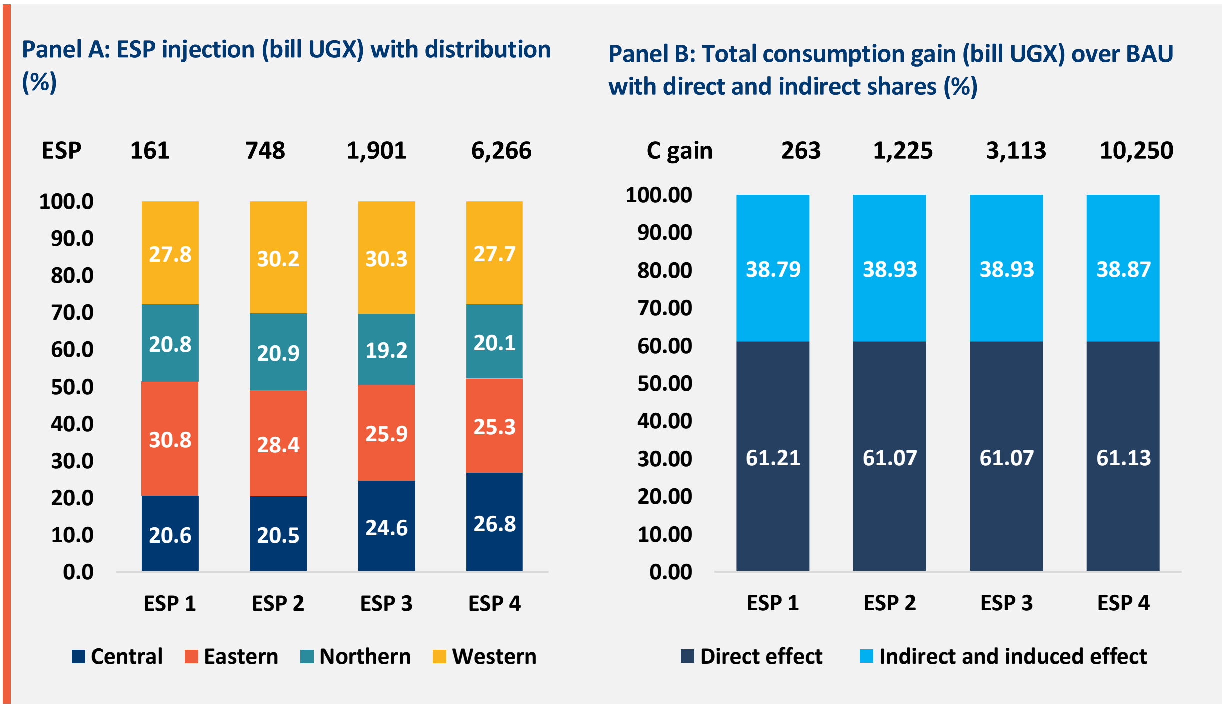
Note: BAU 1 = 2021/22, BAU 2 = 2023/24, BAU 3 = 2026/27, and BAU 4 = 2030/31

6.3 Simulation Results

6.3.1 Impacts on Household Income/Consumption

The proposed cash transfers schemes under the ESP programme are direct tax-financed transfers from government to the beneficiary household groups. Total transfer amounts are expected to increase from UGX 161 billion in FY 2021/22 to UGX 6,266 billion in FY 2030/31. A key task was to distribute these transfers to the 40 representative household groups in each of the four selected years (e.g. FY 2021/22, FY 2023/24, FY 2026/27 and FY 2030/31). The distribution of the total transfer under the cash transfer schemes in the ESP programme across the four regions are shown in Panel A of Figure 17. The shares are static rather than dynamic, capturing the demographic transition as well as design and sizes of three types of schemes. The households in the 'Eastern' region who received almost 31 per cent of the transfers in FY 2021/22 end up with 25 per cent of total transfer amounts in FY 2030/31. On the other hand, the households in the 'Central' region experienced continuous increase in their transfers from almost 20.6 per cent in FY 2021/22 to around 27 per cent of total transfer amounts in FY 2030/31. The transfer amounts for the households in the 'Western' region varied between 28 per cent and 39 per cent. A stable transfer amount of around 21 per cent has been found for the households in the 'Northern' region. Panel B of Figure 18 captures the total consumption by these four selected years over the BAU consumption. The simulated total income/consumption gains are significantly larger than the direct ESP transfer amounts. For instance, in FY 2021/22, total gain is UGX 263 billion against the direct ESP transfer amount of UGX 161 billion – implying UGX 102 billion increase over the direct transfer. The additional gains accrue to the households are due to the indirect and induced effects of the economic system – captured by the SAM multipliers. The decomposition of the total gains by direct and indirect effects suggests that the contribution of the indirect and induced effects is around 39 per cent – captured through the multiplier effects of the SAM model.

Figure 18: ESP injection and consumption gains

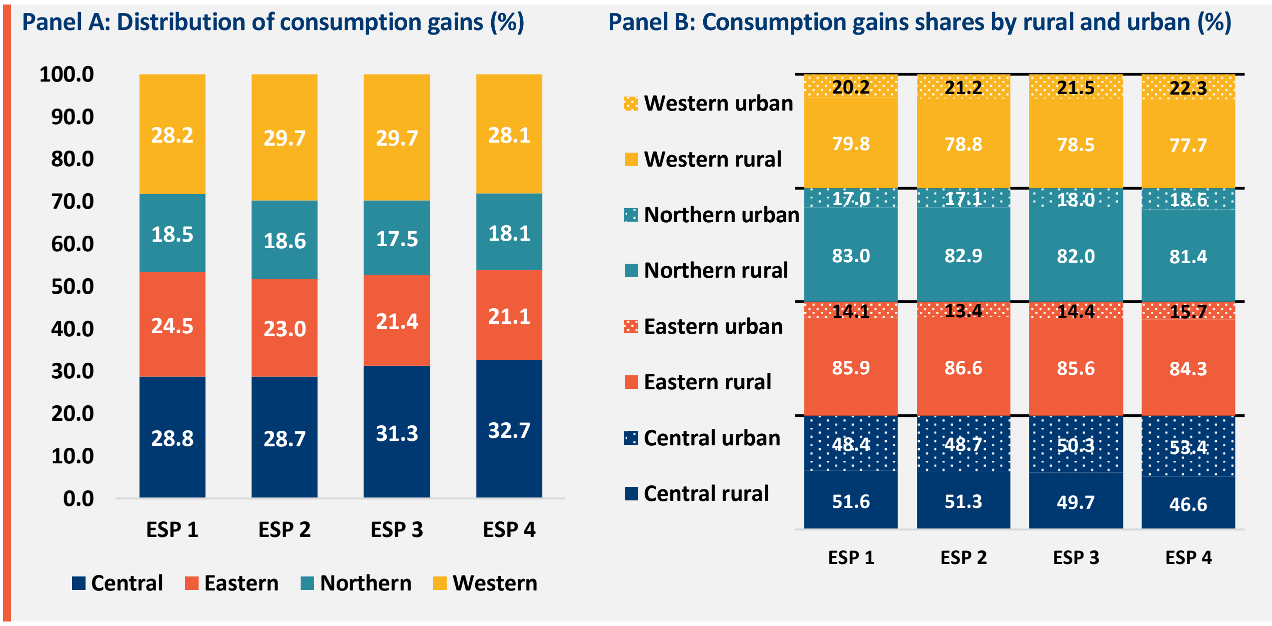


Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

The distribution of the total consumption gains (captured in Panel B in Figure 18) among the households in the four regions are shown in Panel A of Figure 19. It envisaged that relatively higher gains accrue to the households in the 'Central' and 'Western' regions – supposedly due to their higher integration with the economic system and growth process – a phenomenon being captured by the SAM multiplier model. The differences between the consumption gain against the ESP transfers (e.g. 18.5 % vs 20.8 % for the Northern region) is due to 39 per cent indirect and induced shares. Notably, because of their weaker integration to the economy as captured in the original SAM, the indirect and induced benefits accrue to less to the Northern and Eastern regions and more gains to the Central and Western regions (for instance under ESP 1, the distribution of additional indirect consumption gain to the Norther region is 14.9 per cent; Eastern region is 14.7 per cent; Central region is 41.8 per cent and Western region is 28.7 per cent – resulting to these differences in the distribution of the consumption gains compare to the ESP transfers. The policy implication of the above outcome is that, ceteris paribus, significantly more ESP transfers need to be given to the households in the Northern and Eastern regions compared to the households in the Central and Western regions.

The total gains by household groups in these four regions are further dissected between the rural and urban household groups in each of these four household groups. Interestingly, except for the 'Central' region – where gains are almost equally shared between the rural and urban households – the gains went mainly to the rural household groups in other three regions. For instance, 86 to 87 per cent of total gains of the 'Eastern' household groups went to the rural households. The share of gains for rural household in the 'Northern' region is around 83 per cent. The ratio of rural to urban is around 79:21 for the households of the 'Western' region.

Figure 19: Distribution of consumption gains by regional and rural-urban household groups

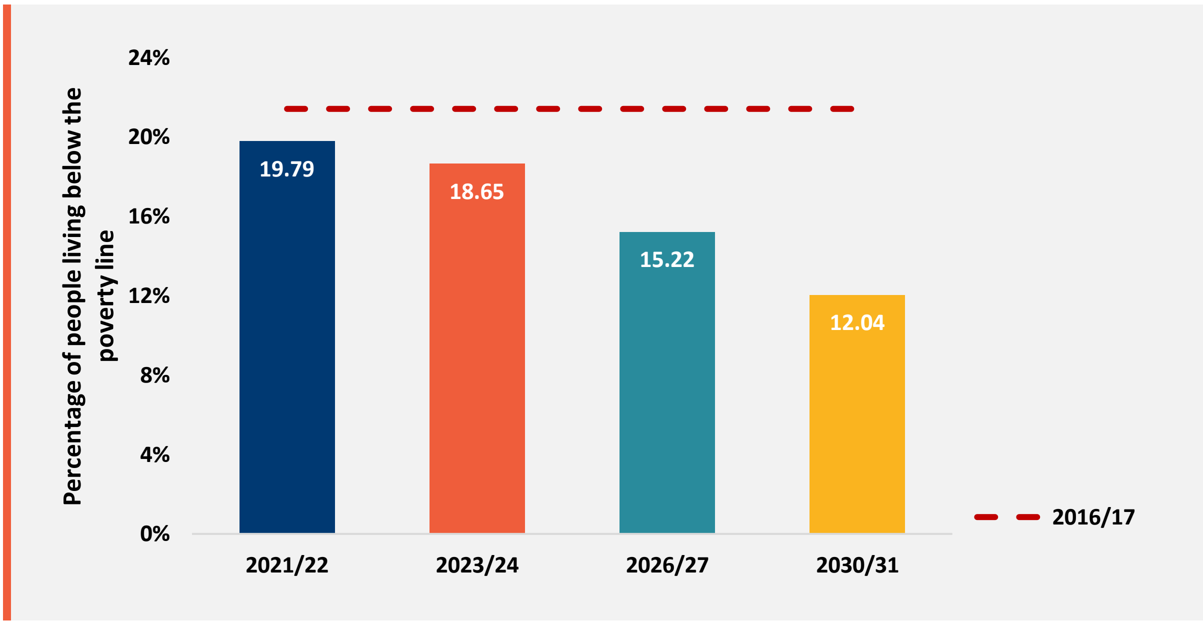


Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

6.3.2 Impacts on Household Poverty

Increase in income/consumption of the household groups have salutary impact on their poverty level. Poverty impacts of total income/consumption gains on the headcount poverty level is shown below in Figure 20. The positive impacts of ESP transfers have been clearly captured by the reduction in the headcount poverty rates in each of the four selected years. Headcount poverty may likely to drop to 19.8 per cent in FY 2021/22. In comparison to the headcount poverty rate of 21.4 per cent in FY 2016/17, the headcount poverty ratio in FY 2021/22 suggest a decline of 1.83 percentage points over the five-year period. Estimated headcount poverty is 18.7 per cent with the expansion of ESP in FY 2023/24. This suggests a further decline in the poverty rate in FY 2023/24 by 1.14 percentage points from FY 2021/22 and 2.8 percentage points in FY 2016/17. The largest poverty reduction has been found under the full expansion of ESP in FY 2030/31 due to the largest total income/consumption gains. The headcount poverty rate may drop to 12.04 per cent – envisaging 7.75 percentage points reduction over the 9-year period. It also implies an annual poverty reduction rate of 0.86 per cent between FY 2021/22 and FY 2030/31.

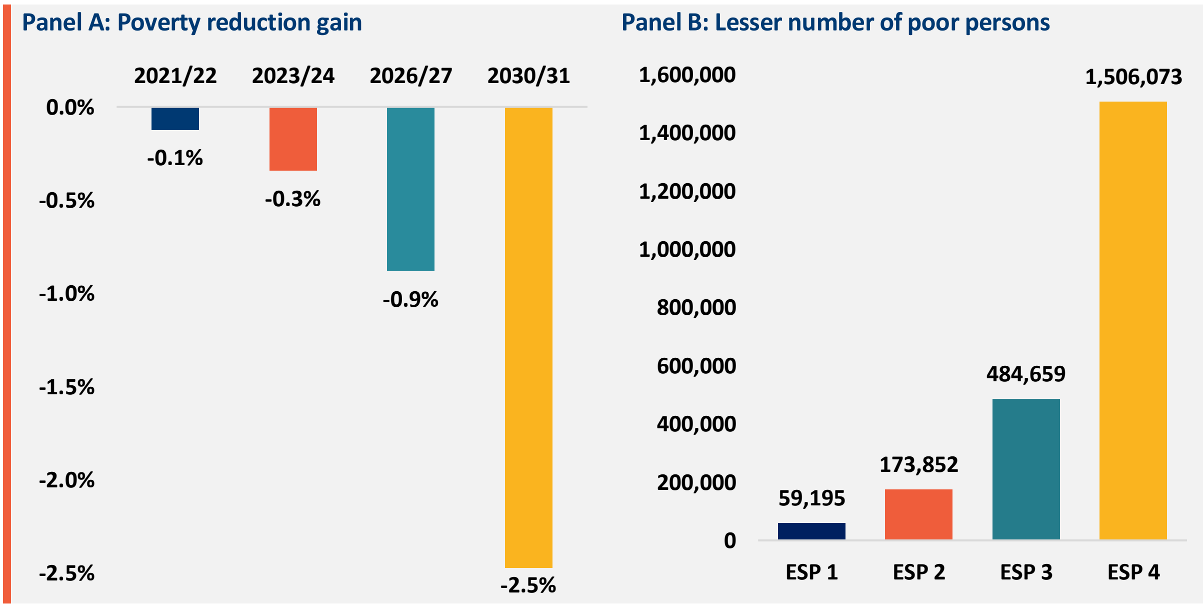
Figure 20: Headcount poverty with ESP, by selected years



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM mode

The figure below captures impacts of the expansion of the ESP on the poverty reduction in comparison to the poverty reduction under the BAU scenarios. The growth rates projected for the BAUs are optimistic thus perhaps close to the policy scenarios. Even against these optimistic BAU scenarios – poverty reduction rates under ESP are impressive (Panel A of Figure 21). The gain in poverty reduction in ESP 1 over BAU 1 is -0.12 percentage points. The percentage point gain in poverty reduction is -0.30 in ESP 2, -0.9 in ESP 3 and -2.47 in ESP4. Panel B of Figure 21 shows number of non-poor persons due to ESP transfers. The number of non-poor increases from 59,195, persons in ESP 1 to 1,506,073 persons in ESP 4.

Figure 21: Gain in poverty reduction under ESP over BAU

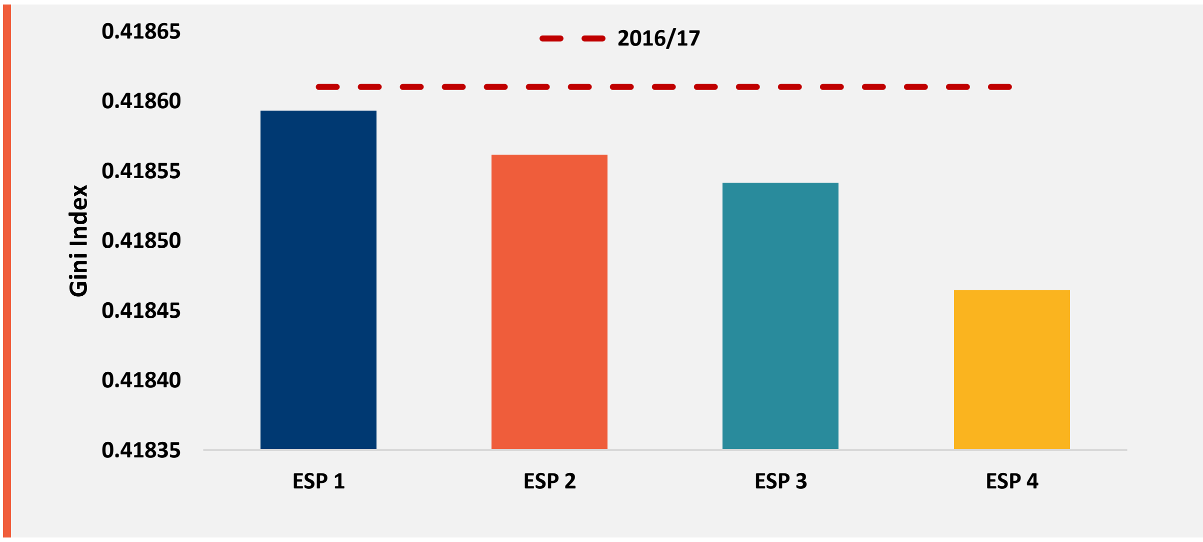


Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

6.3.3 Impacts on Household Inequality

Growth and poverty outcomes of currently pursued growth process suggests two opposing conclusions – declining poverty with rising inequality. Rising inequality is a major concern. It has been argued that a social protection system, if implemented properly, may help abate inequality. Accordingly, ESP impacts on inequality has been captured below. Although, the total income/consumption gains are distributed among the households according to their observed shares in FY 2016/17, the Gini indices suggest an improvement in inequality due to ESP transfers – albeit small (Figure 22).

Figure 22: Reduction in Gini index under ESP



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

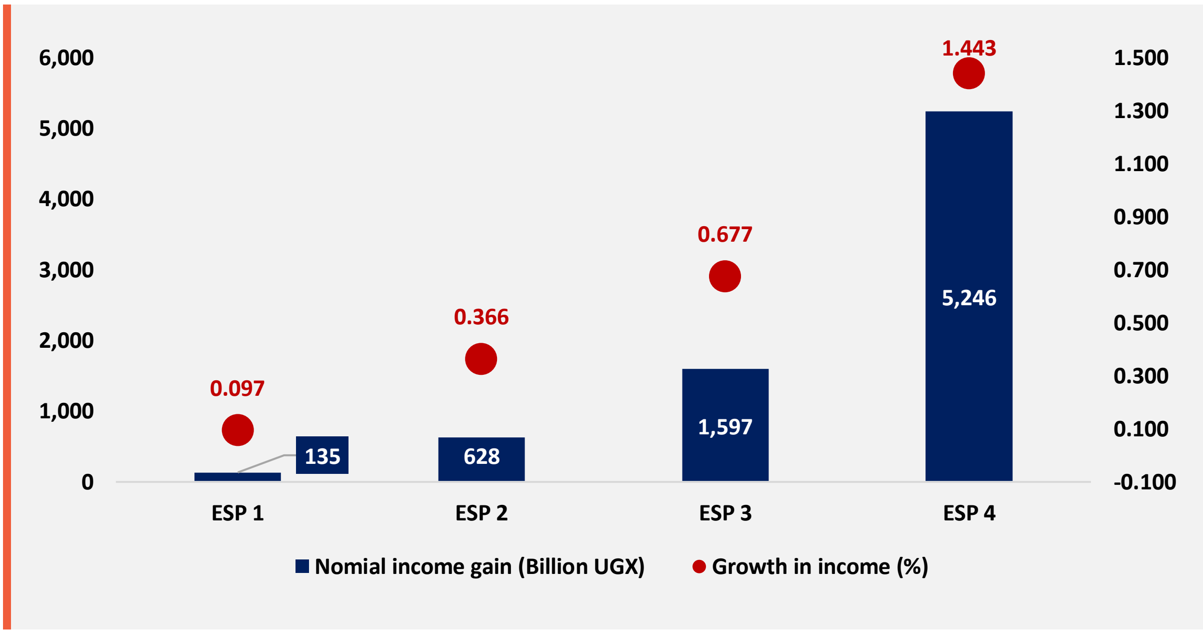
6.3.4 Impacts on National Income (Nominal and Real)

The most widely used and accepted indicator to measure economic well-being is GDP or national income. It is the sum of values of all goods and services produced in an economy in a particular time period (e.g. usually a quarter or a year). There are two valuations of GDP – nominal and real. Nominal GDP includes the prices of the goods and services, while real GDP excludes the price factor. All else constant, a positive intervention through augmenting household income and consumption is likely to enhance national income through the interdependent system and multipliers. The simulated impacts on GDP are presented below.

Simulated nominal GDP[15] gains under the ESP simulations over the BAU values are shown for all the four years – 2021/22; 2023/24; 2026/27 and 2030/31 (Figure 23). It also shows the growth in incomes between the BAU scenarios and ESP simulations. Nominal income gain under the ESP 1 over BAU 1 (or in FY 2021/22) has been simulated at 135 billion UGX generating a growth rate of 0.097 per cent. The income gain under the ESP 4 over BAU 4 increased to 5,245 billion UGX in FY 2030/31. This implies a growth rate of 1.443 per cent.

[15] We consider factor price GDP in the SAM framework. Factor price GDP only exclude two items – product taxes and subsidies and finance service charges.

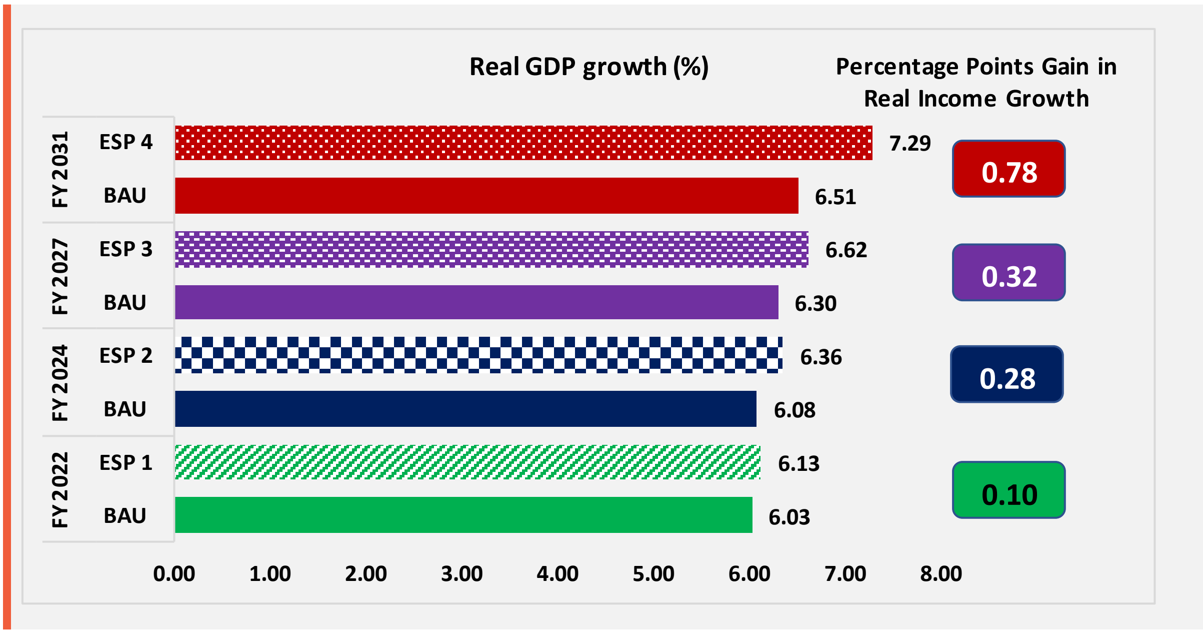
Figure 23: Nominal income gains under the ESP simulations over BAU scenarios



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

Activity level nominal GDP values are deflated using the activity level GDP deflators for the four years to arrive at activity level real GDP values for 2021/22; 2023/24; 2026/27 and 2030/31. The impacts on real GDP has been found positive under all the four ESP simulations. The Figure below captures the real income growth in four selected years under the ESP simulations. It clearly shows the impacts that ESP will have on generating additional income compared to their corresponding BAU values.

Figure 24: Real income gains under the ESP simulations

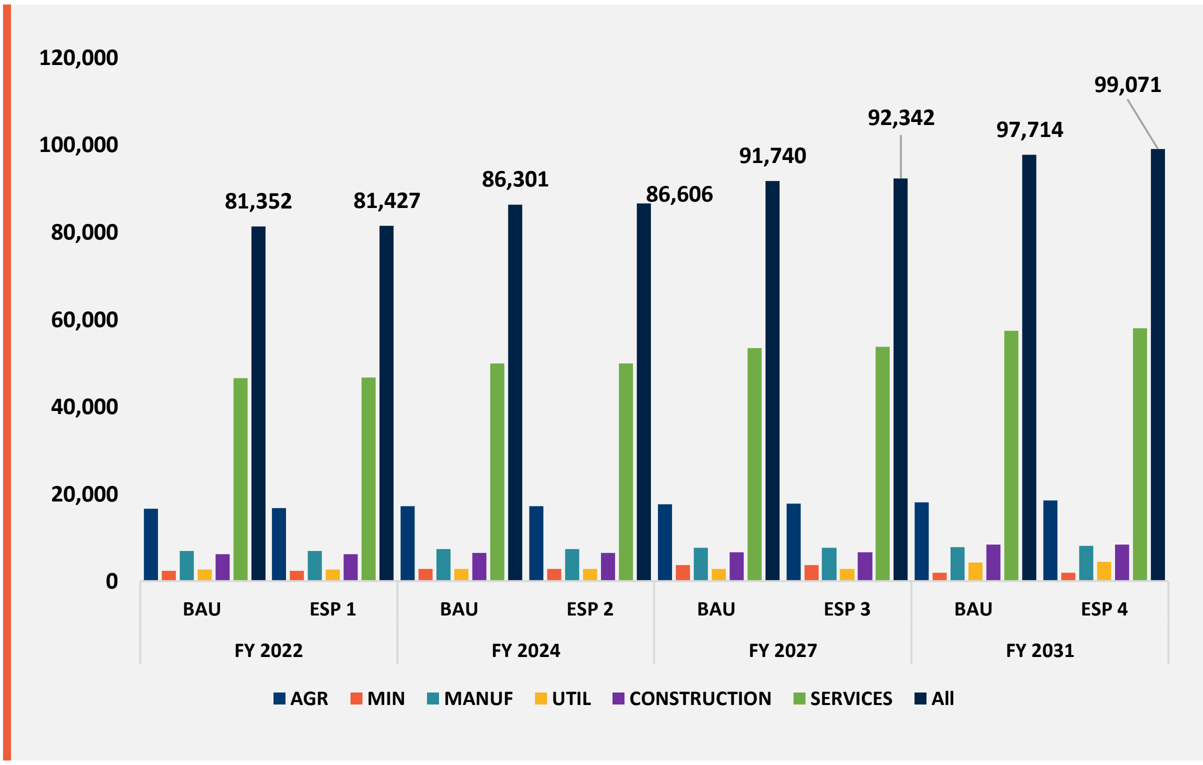


Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

The Figure below shows the patterns on real income generation under BAU and ESP simulations for broad activities such as agriculture, mining, manufacturing, utilities, construction and services activities. Overall income expansion has been expected to be satisfactory such that income expansion would double to UGX 162,260 billion in FY 2030/31 from UGX 89,663 billion in FY 2021/22.

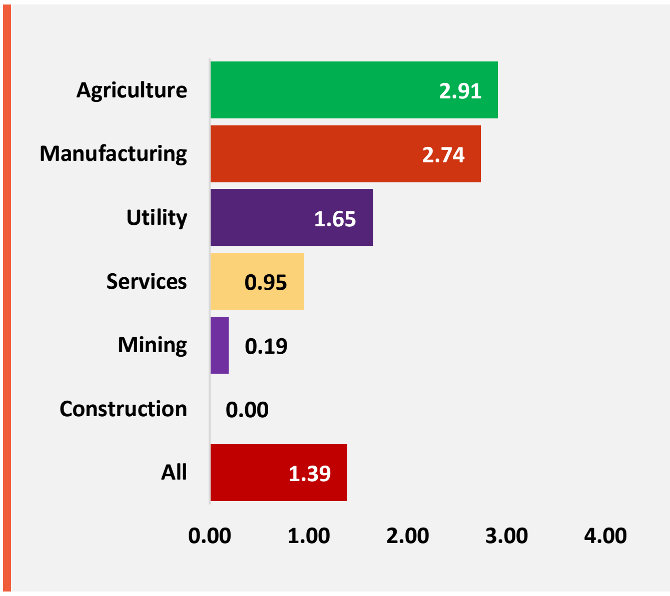
The proposed investments under the ESP programme are also likely to spur income gain on top of the gain found under BAU scenarios. The gain in FY 2021/22 due to ESP1 has been found UGX 76 billion. For FY 2023/24, the gain is UGX 305 billion. The gain is even higher in FY 2026/27 at UGX 602 billion. The highest gain has been found for FY 2030/31 at UGX 1,357 billion. The simulation results thus suggest that if other thing remaining the same, ESP interventions are likely to spur growth in Uganda with gain expected to increase with higher ESP allocation.

Figure 25: Income gains by broad activities under the BAU and ESP simulations (Billion UGX)



Source: based on the Uganda SAM model

Figure 26: Real income gains by broad activities under ESP over BAU in 2030/31



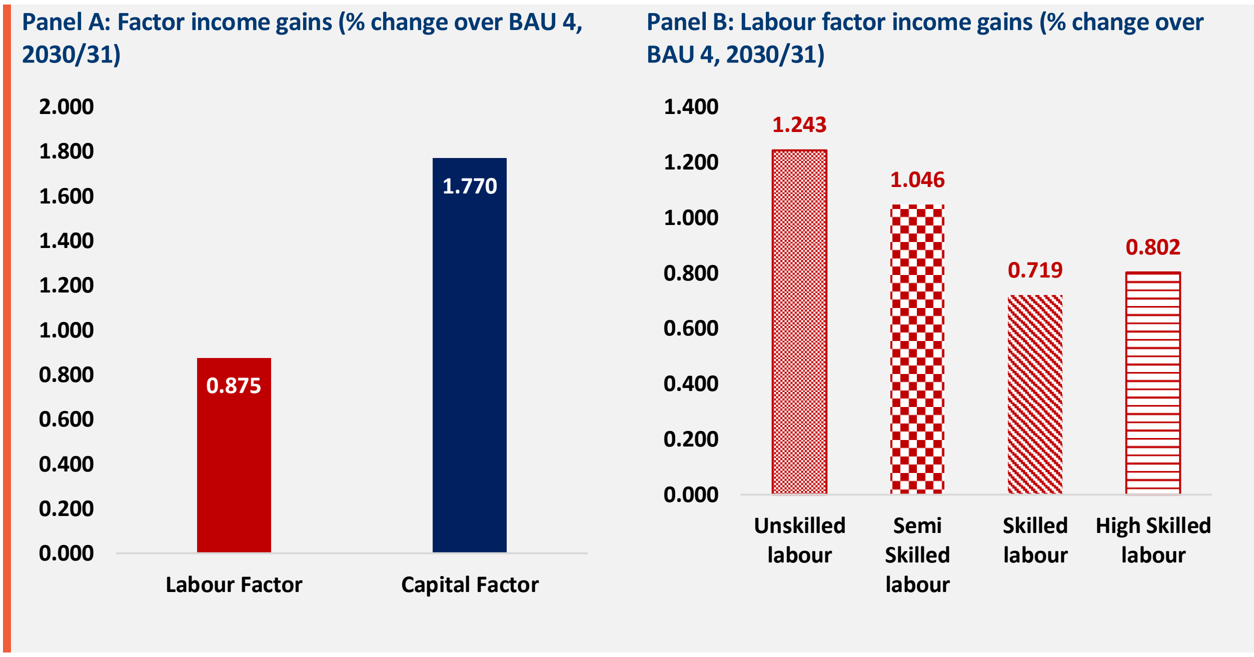
Source: ESP SAM Model

The adjacent figure captures real income growth in ESP 4 simulation over the BAU 4 (i.e. FY 2031) by broad activities. The largest beneficiary is the agriculture activities with a growth rate of 2.91 per cent. Manufacturing activity is in the second place with 2.74 per cent growth. Growths for utility, services and mining activities are respectively 1.65 per cent, 0.95 per cent and 0.19 per cent. All of these income growths are considered indirect impacts of ESP transfer given to households (the direct impact). Construction is a pure final good sector such that there are no intermediate usages of the sector's output. As a result, there are no indirect or induced impacts of direct intervention (i.e. ESP transfer) in the case of construction activity and hence it recorded no (or zero) income growth.

6.3.5 Factor Income Implication

It has been noted that according to the 2017 ESP SAM, Ugandan is an overwhelmingly capital-intensive economy. Thus, income expansion is expected to lead to higher growth of capital factor compared to the labour factor. To illustrate this, the simulated factor income growth of ESP in 2030/31 should be considered. Panel A of Figure 27 shows that capital factor income growth in 2030/31 (1.770 per cent over BAU) is more than double of that found for the labour factor income growth (0.875 per cent over BAU). Panel B of Figure 27 captures income growths of the four types of labour factors. A progressive pattern has been found with unskilled labour factor recording highest growth rate of 1.243 per cent among the four labour factors.

Figure 27: Factor income gains under the ESP 4 simulation

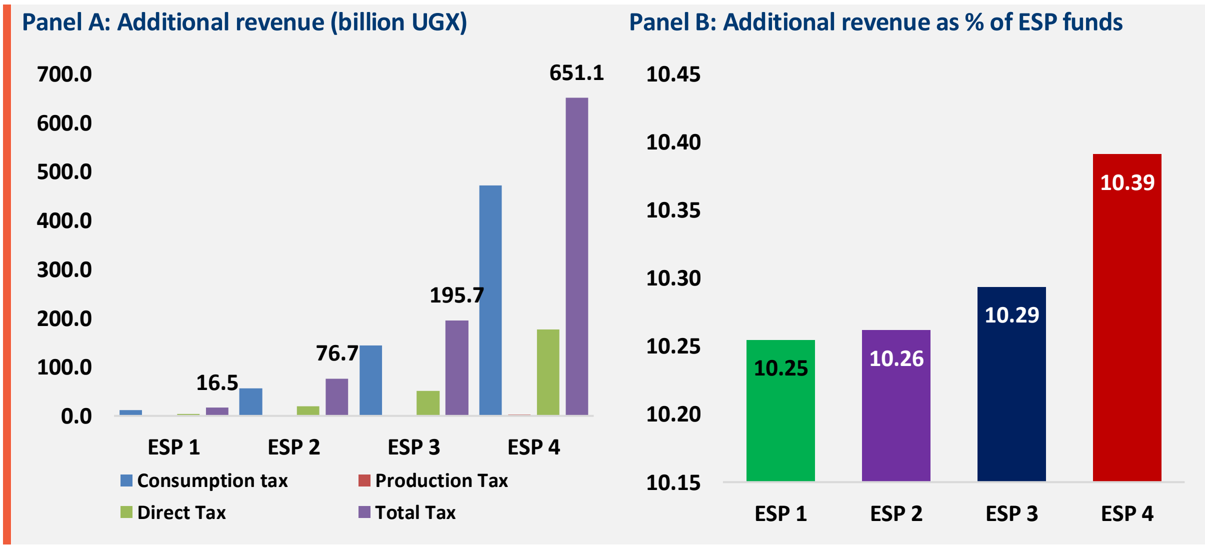


Source: Uganda SAM model

6.3.6 Revenue Implication

Both tax rates and tax net[16] have remained unchanged under simulations. However, as a result of economic expansion, revenue has increased under all the four simulations, albeit to different extent (Figure 28). Since, economic expansion is highest in the scenario of ESP in 2030/31 (ESP 4), largest revenue gain is also found for this scenario. Revenue gain may be as high as UGX 651 billion. Lowest revenue gain of UGX 17 billion has been found for the scenario of ESP in 2021/22. However, additional revenue gains (i.e. autonomous) are between 10 and 11 per cent of the ESP budget requirements.

Figure 28: Revenue gains under the ESP simulations

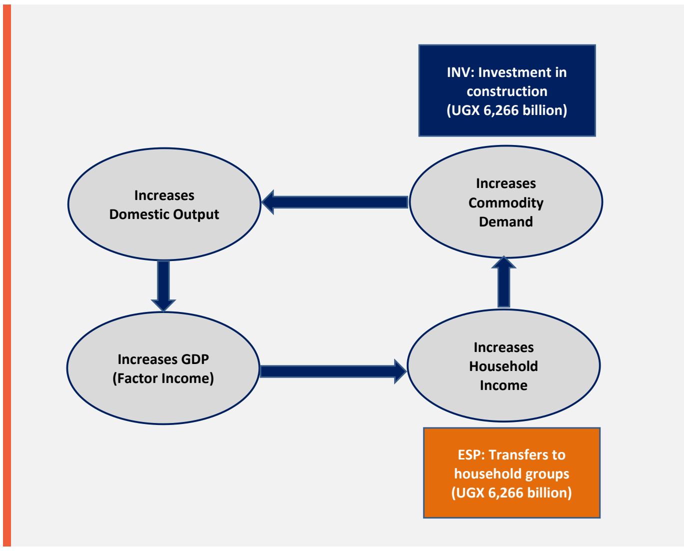


Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

[16] Legal tax net.

6.3.7 Alternative Simulation

Figure 29. Transmission channels of alternative interventions



As mentioned above the schemes under the ESP programmes are direct cash transfers to household groups financed from tax revenue. Since ESP is financed through tax revenue, a relevant question is: what is the opportunity cost of UGX 6,266 billion channelled to households through under the scenario of ESP in 2030/31?[17] The issue of opportunity cost may be addressed by exploring the potential impact of channelling the same amount of resources into an alternative investment project such as infrastructure development or construction activity as construction is thought to be a pure investment goods leading to capital formation fostering long term growth. Thus, instead of transferring UGX 6,266 billion to the forty household groups under ESP 4 (in 2030/31), in this simulation, labelled "INV 4", the funds (i.e. UGX 6,266 billion) are allocated to a construction activity. The transmission channels of both of these interventions are shown in the chart above (Figure 29). Investment injections augments the capital goods and thus likely to have greater impact on growth compared to the ESP injection via the household groups.

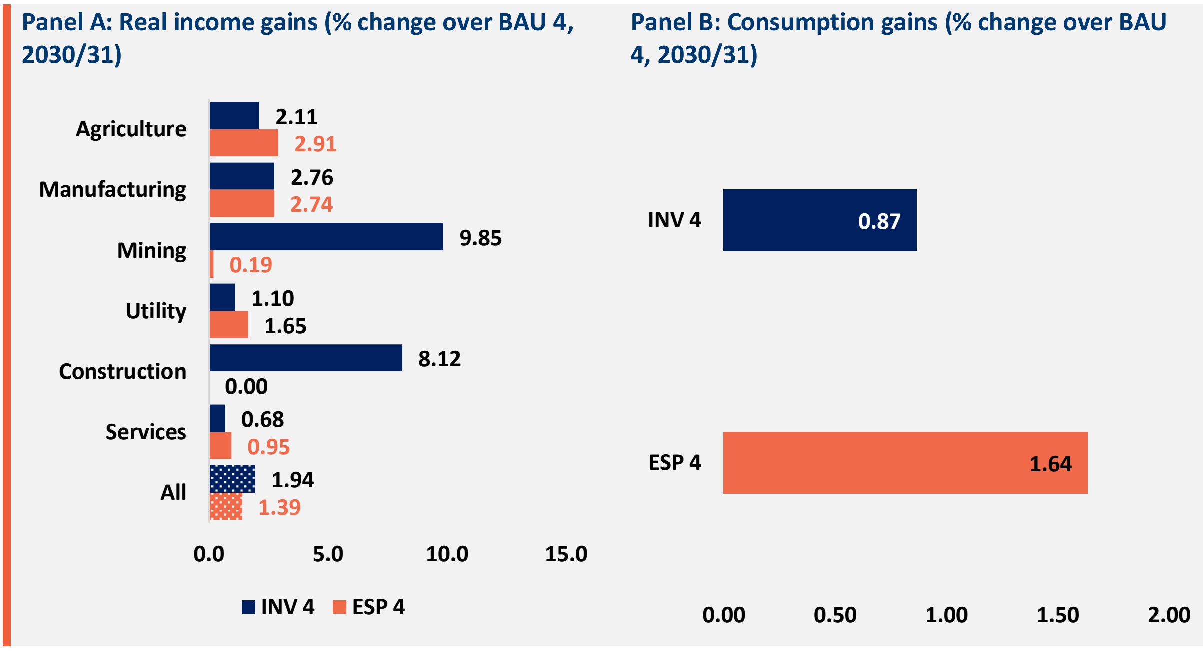
Simulated impacts are reported in terms of real income or real GDP, and household consumption. Moreover, real income outcome is reported using broad classifications of activity (i.e. six activities aggregated from the 32 activities), and total household consumption.

Overall, effects on real income are close under the two interventions. More specifically, increase in real income as percentage of BAU 4 real income is 1.94 under the INV 4 simulation compared to 1.39 under the ESP 4 simulation. However, an interesting finding is the pattern of effects across the broad activities. Under the INV 4 simulation, the effect is dominated by construction and mining. In the case of the ESP 4 simulation, agriculture turns out to be the dominated activity. However, except for agriculture and construction (which is purely capital goods generation activity), the impacts are much more even across the remaining three activity categories.

Consumption gain is significantly larger in the ESP 4 simulation compared to the INV 4 simulation. More specifically, gain is 1.64 per cent in ESP 4 compared to 0.87 per cent in INV 4 simulation. Overall, these outcomes under the alternative simulations tend to suggest that welfare is higher in ESP 4 simulation compared to INV 4 simulation.

[17] We used ESP 4 to illustrate the point. This can be extended to any other three ESPs.

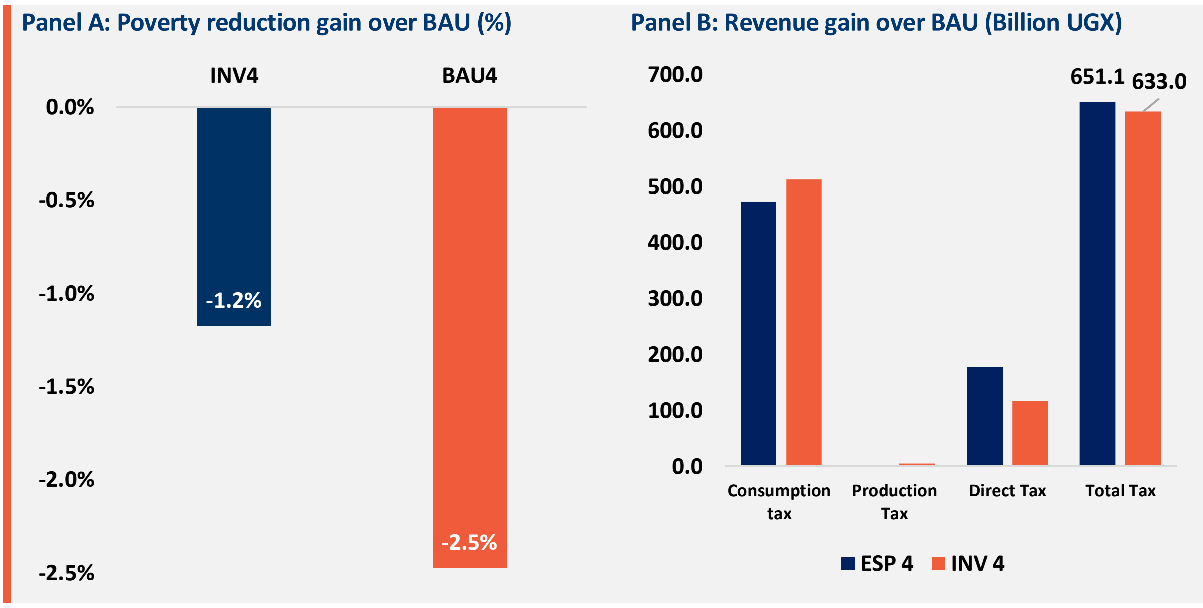
Figure 30: Comparison of real income and consumption gains under the ESP 4 and INV 4 simulations



Source: Uganda SAM model

Since consumption gain is significantly larger in the ESP 4 simulation compared to the INV 4 simulation, the corresponding poverty impacts are also substantially large under ESP 4 compared to UNV4. This comparison is shown in the Table below. It shows that the poverty reduction rate under ESP4 (2.5 per cent) is more than two times than that of INV4 (1.2 per cent). The revenue gains are more or less same at around 650 billion UGX.

Figure 31: Comparison of Gain in poverty reduction and revenue under ESP4 and INV4



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP SAM model

7 DCGE Simulations: Design and Results

The numerical specification[18] of a general equilibrium model to a macro consistent dataset is the first, but most important, step in a CGE exercise. The 2017 ESP SAM is a general equilibrium dataset. Thus, the dynamic computable general equilibrium (DCGE) model for Uganda has been calibrated to the ESP SAM 2017. Results of the base run of the DCGE model satisfy the model validation properties, namely the reproduction of the SAM values. Validation of the DCGE also suggests that the model is ready to conduct policy simulations.

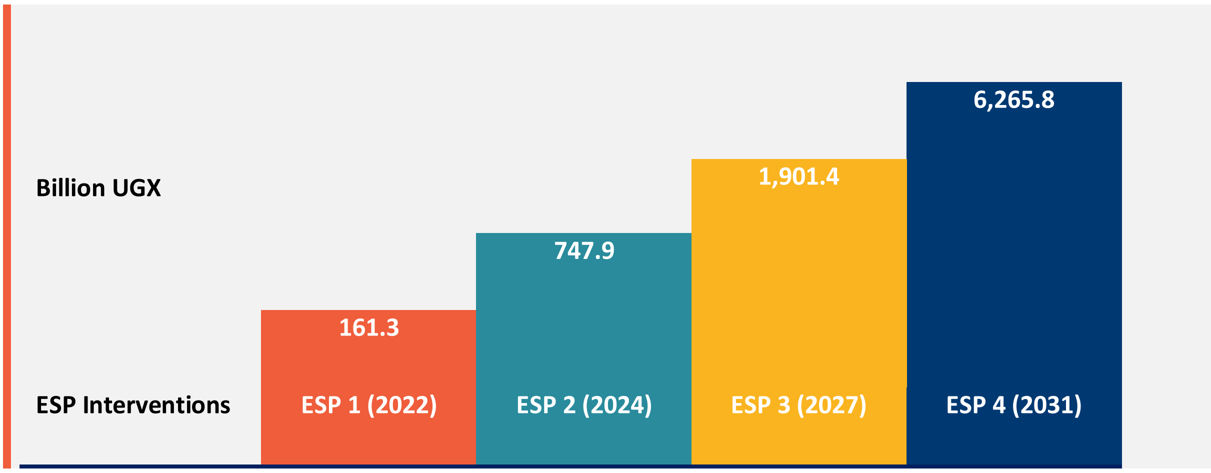
7.1 ESP Simulation Design

In both static and dynamic CGE models, simulations are usually performed by modifying the fixed parameters such as tax rates; subsidy rates; income tax rates and import duty rates etc. Moreover, some of the prices are exogenous to the system. They may also be altered to conduct simulations. These include world price of imports; world price of exports; and nominal interest rates etc. Furthermore, institutional transfers (which are exogenous to the system) may also be modified to perform simulations. Some of them composed of government transfers to households and corporations, remittances from the rest of the world to households, government expenditure, and investment demand. Two types of simulations have been conducted: (i) a BAU simulation; and (ii) policy simulations (ESP injections).

Business as Usual (BAU): Two key drivers – accumulation of capital and increase in labour supply – have been specified to simulate the BAU scenario.

Expanding Social Protection (ESP): Expansion of the social protection system in Uganda has been planned to happen between FY 2021/22 and FY 2030/31 focusing on the Senior Citizens Grants (SCG); child benefit (CB); and disability benefit. In simulating, ESP interventions (given to the households) are added to the BAU simulations. Figure 32 below presents the intervention values under the ESP scenarios.

Figure 32. ESP scenarios (intervention), by selected fiscal years



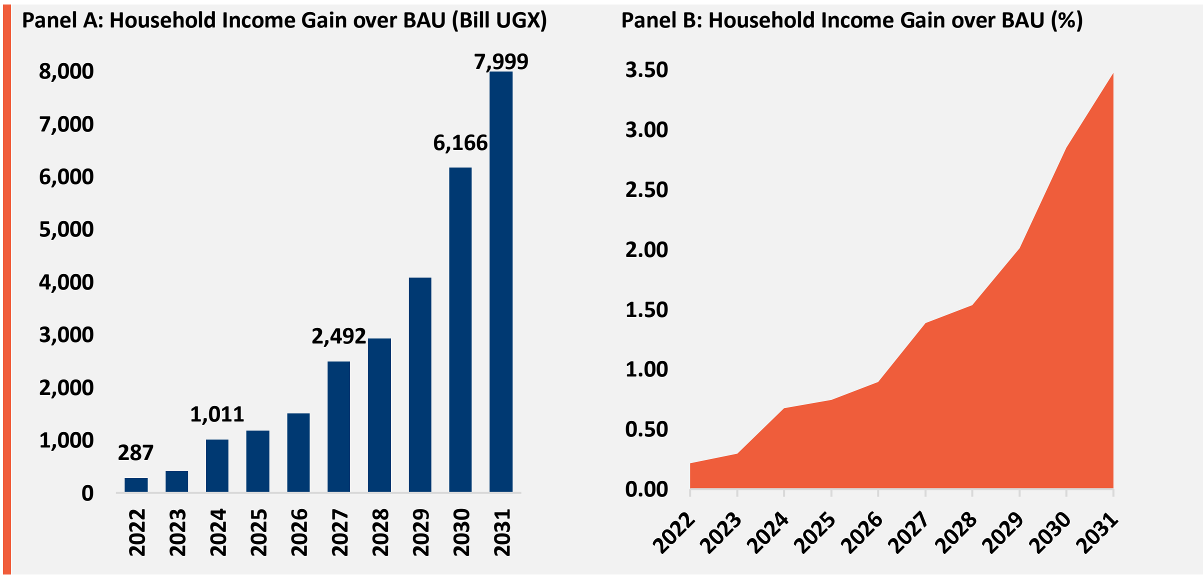
[18] In CGE jargon, this refers to delineation of algebraic specification with data sets.

7.2 Simulation Results

7.2.1 Impacts on Household Income/Consumption

As mentioned above, the proposed cash transfers schemes under the ESP programme are direct tax-financed transfers from government to the beneficiary household groups. Total transfer amounts are expected to increase from UGX 161 billion in FY 2021/22 to UGX 6,266 billion in FY 2030/31. As expected, positive impacts on the household income levels has been found under the ESP injections. Additional gain in household income (over the BAU income gain) has been found for each year of the period between 2022 and 2031. For instance, household income increased from Billion 287 UGX in FY 2021/22 to Billion 7,999 UGX in FY 2030/31. This also implies that household income gain as per cent of BAU income is 0.22 per cent in 2022 and increases to around 3.5 per cent in 2031.

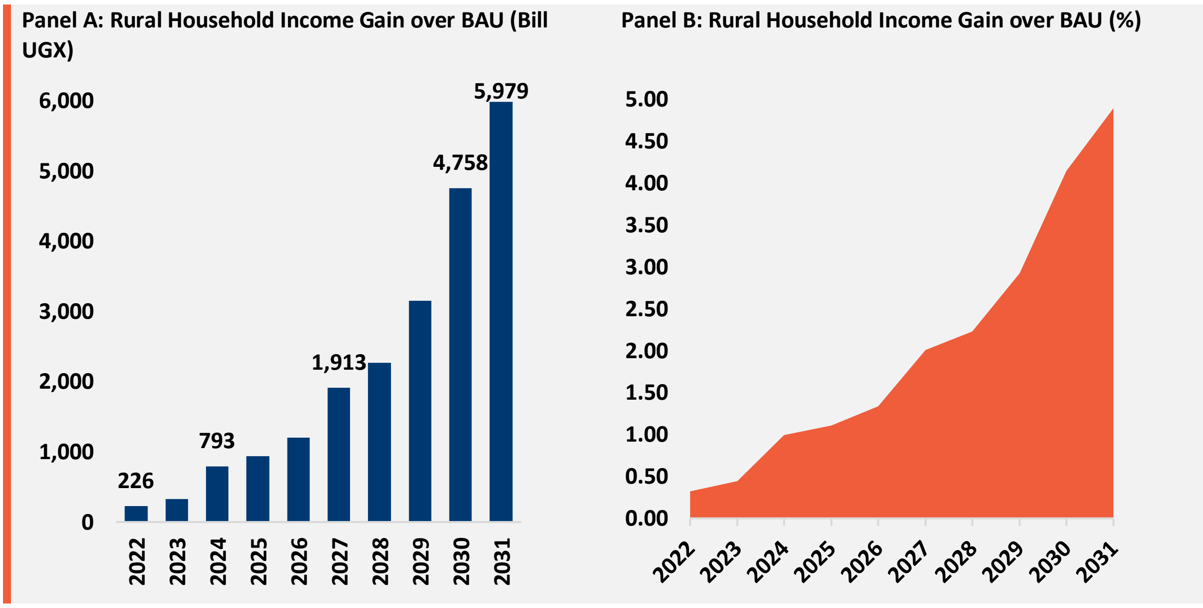
Figure 33. Household income gain due to ESP interventions



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP DCGE model

Income gains for rural households also envisaged positive impacts of ESP interventions. Rural household income increased from UGX 226 billion in 2022 to UGX 5,979 billion in FY 2031 implying a 0.32 per cent income gain (over the BAU income) in 2022 and a 4.9 per cent income gain in 2031. This also suggests that per cent gain in income for rural households is higher than the per cent gain found for all households considered together.

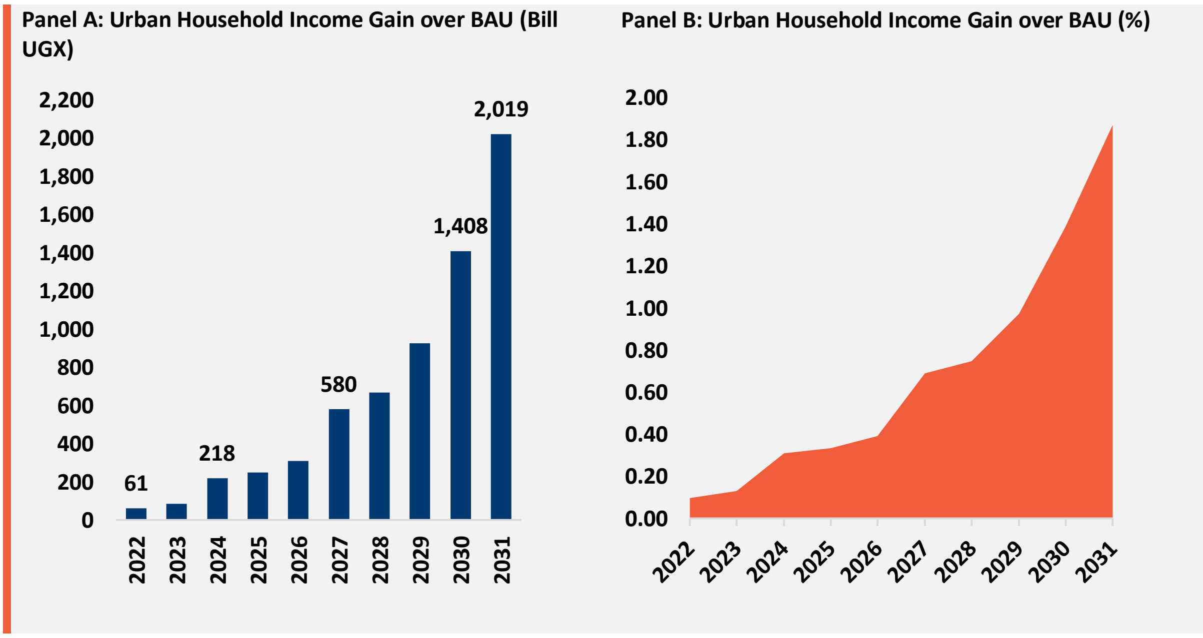
Figure 34. Rural household income gains due to ESP interventions



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP DCGE model

Figure 35 below captures the income gains of the urban household groups. Income gains for the urban household groups are substantially less than the income gains found for the rural household and all household groups considered together due mainly to smaller ESP injections for the urban household groups. Urban household income increased from UGX 61 billion in 2022 to UGX 2,019 billion in FY 2031 implying only a 0.1 per cent income gain (over the BAU income) in 2022 and a 1.9 per cent income gain in 2031.

Figure 35. Rural household income gains due to ESP interventions



Note: ESP 1 = 2021/22, ESP 2 = 2023/24, ESP 3 = 2026/27, and ESP 4 = 2030/31. Source: Authors' calculation, ESP DCGE model

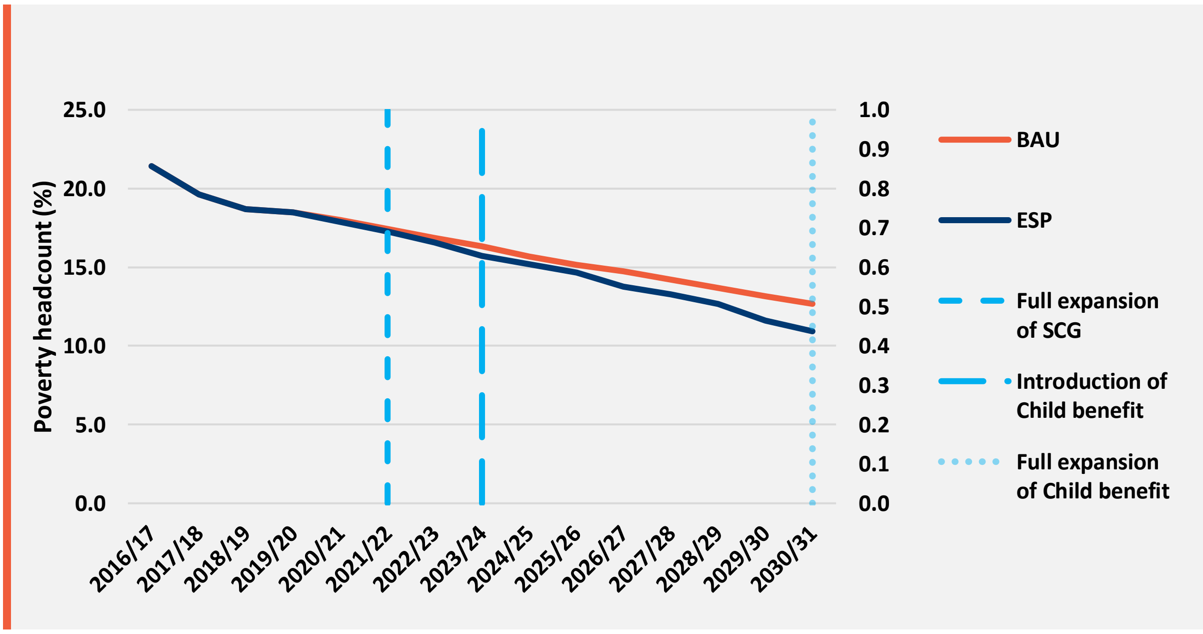
In summary, the simulated impacts on income and consumption by households indicate that:

- ESP interventions have positive impacts on household income – due to the direct transfer as well as secondary effects from the economic system;
- Simulated household income gains are large, ranging from UGX 228 billion in 2022 to UGX 7,999 billion;
- Household income increased with increased ESP interventions. For instance, in 2022, the overall income gain was UGX 228 billion against ESP interventions of UGX 161 billion. However, in 2031, the overall income gain was UGX 7,999 billion against ESP interventions of UGX 6,256 billion;
- The income gains are higher for the rural households compared to their urban counterparts, mainly due to higher level of ESP interventions in rural areas;
- As income is the main determinant of household consumption, an increase in household income led to a rise in household consumption in line with what has been found in the case of income gain (please see Annex 7.5).

7.2.2 Impacts on Household Poverty

Increase in income/consumption of the household groups have a salutary impact on their poverty level. Impacts of total income/consumption gains on the headcount poverty level is shown below in Figure 36. The positive impacts of ESP transfers have been clearly captured by the reduction in the headcount poverty rates with the introduction of ESP from 2021/22. Headcount poverty is likely to drop to 17.3 per cent in FY 2021/22 from 21.4 per cent in 2016/17, and may drop further to 15.7 per cent in 2023/24; to 13.7 per cent in 2026/27; and to 10.9 per cent in 2030/31. Thus, over the 14-year period (from 2016/17 to 2030/31) the headcount poverty reduction rate is 10.5 per cent implying an annualised reduction rate of 0.75 per cent.

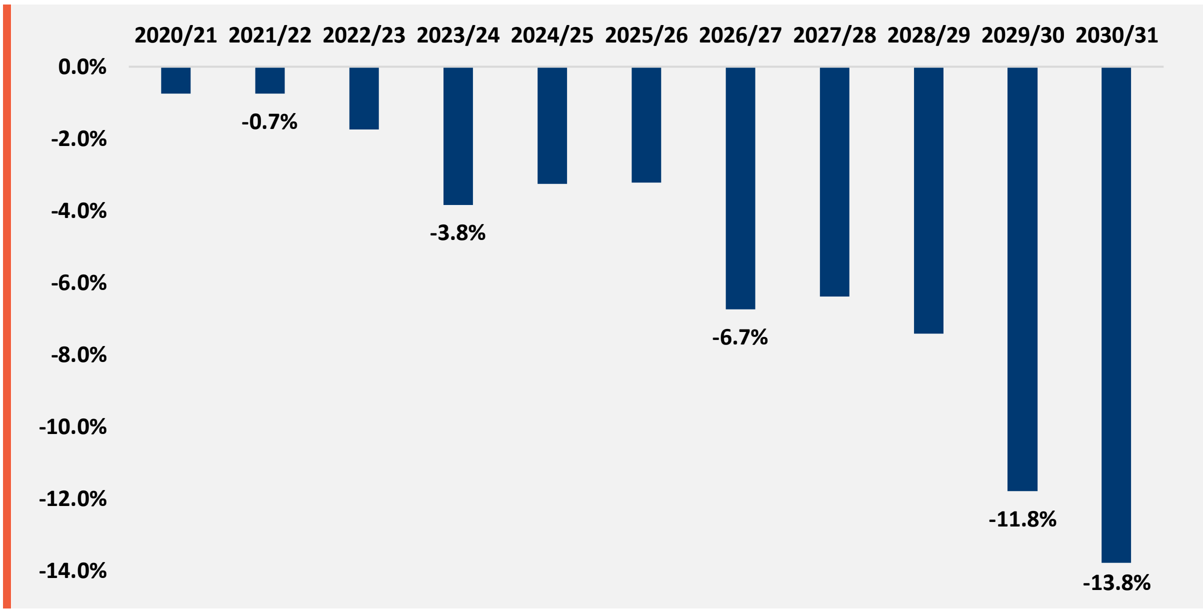
Figure 36: Headcount poverty under BAU and ESP scenarios



Source: Authors' calculation, ESP DCGE model

Poverty reduction rates under ESP scenarios are significantly higher than the poverty reduction rates found under the BAU scenarios. Figure 37 captures the impacts of ESP on the poverty reduction in comparison to the poverty reduction under the BAU scenarios. Poverty reduction rates under ESP, compared to BAU, have been impressive. The gain in poverty reduction in ESP 1 over BAU 1 is -0.7 per cent. The percentage gain in poverty reduction is -3.8 in ESP 2, -6.7 in ESP 3 and -13.8 in ESP4.

Figure 37: Gain in poverty reduction under ESP over BAU



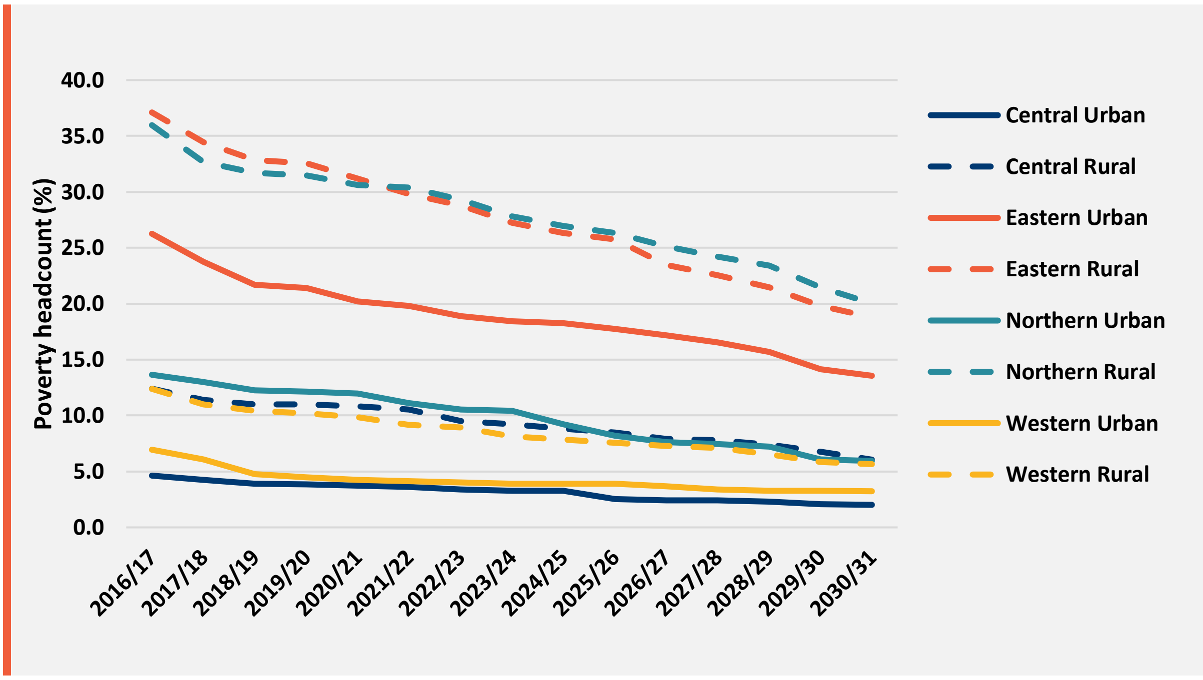
Source: Authors' calculation, ESP DCGE model

Headcount poverty reduction rates across the eight household groups also showed impressive trends over the 14-year period. Poverty reduction gains are highest for rural households of the Eastern and Northern regions. The headcount poverty rate of the rural Eastern household group declined from 37.1 per cent in 2016/17 to 18.8 per cent in 2030/31, suggesting a decline of 18.3 percentage points over the 14 year-period. The annualized reduction rate is 1.3 per cent. The headcount poverty rate of the rural Northern household group declined from 36 per cent in 2016/17 to 20 per cent in 2030/31, suggesting a decline of 16 percentage points over the 14-year period and an annualized reduction rate of 1.14 per cent. Poverty reduction rates of the Eastern household groups are also impressive, showing a decline of the headcount poverty rate from 26.3 per cent in 2016/17 to 13.6 per cent in 2030/31. It implies a decline of almost 13 percentage points over the 14-year period and an annualized reduction rate of 0.91 per cent.

Gains in poverty reduction trend are similar for three household groups: Northern urban; Western rural and Central rural. Headcount poverty rates of these household groups declined from around 13 per cent in 2016/17 to 6 per cent in 2030/31, suggesting a decline of 7 percentage points over the 14-year period.

Poverty reduction rates are lowest among the Western urban and Central urban household groups. The headcount poverty rate of the Western urban household group declined from 6.9 per cent in 2016/17 to 3.2 per cent in 2030/31, predicting a decline of 3.7 percentage points over the 14-year period and an annualized reduction rate of 0.27 per cent. Similarly, the headcount poverty rate of the Central urban household group declined from 4.6 per cent in 2016/17 to 2 per cent in 2030/31, suggesting a decline of 2.6 percentage points over the 14-year period and an annualized reduction rate of 0.19 per cent.

Figure 38: Headcount poverty under BAU and ESP, regions and rural/urban

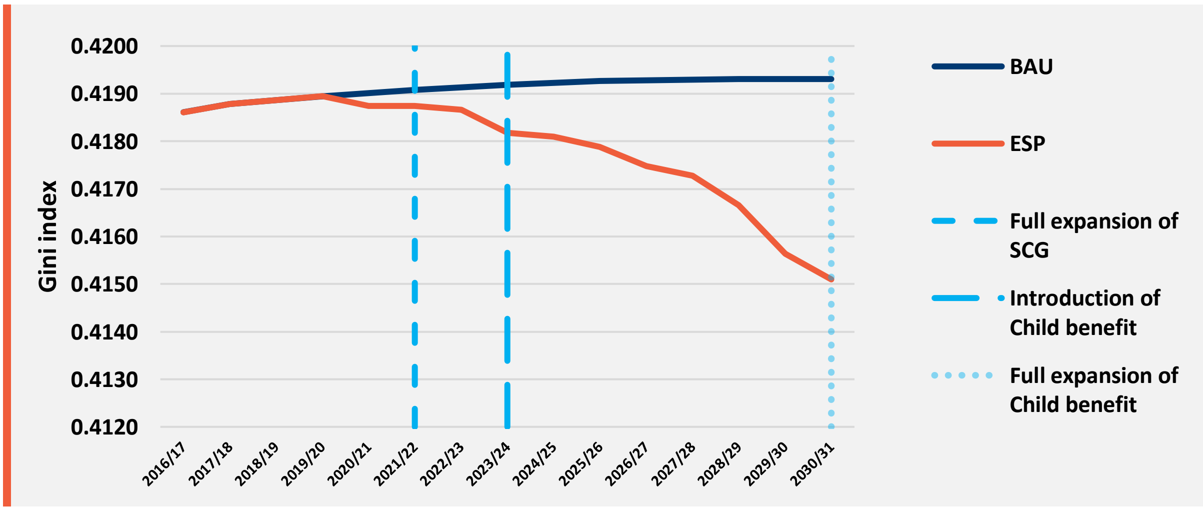


Source: Authors' calculation, ESP DCGE model

7.2.3 Impacts on Household Inequality

The review of growth, poverty and inequality statistics suggests two opposing outcomes – growth with declining poverty, but rising inequality. Rising inequality is a major concern. It has been argued that, if implemented properly, a social protection system may help abate inequality. Accordingly, ESP impacts on inequality has been captured in Figure 39. Although, the total income/consumption gains are distributed among the households according to their observed shares in FY 2016/17, the Gini indices suggest an improvement in inequality due to ESP injections. The positive impacts of ESP transfers have been clearly captured by the improvement of the income distribution as captured by the Gini index with the introduction of ESP (i.e. introduction of full expansion of SCG) in 2021/22. The gains in income distribution are more pronounced with the introduction of child grants in 2026/27; and full expansion of the child grants in 2030/31.

Figure 39: Reduction in Gini index under BAU and ESP



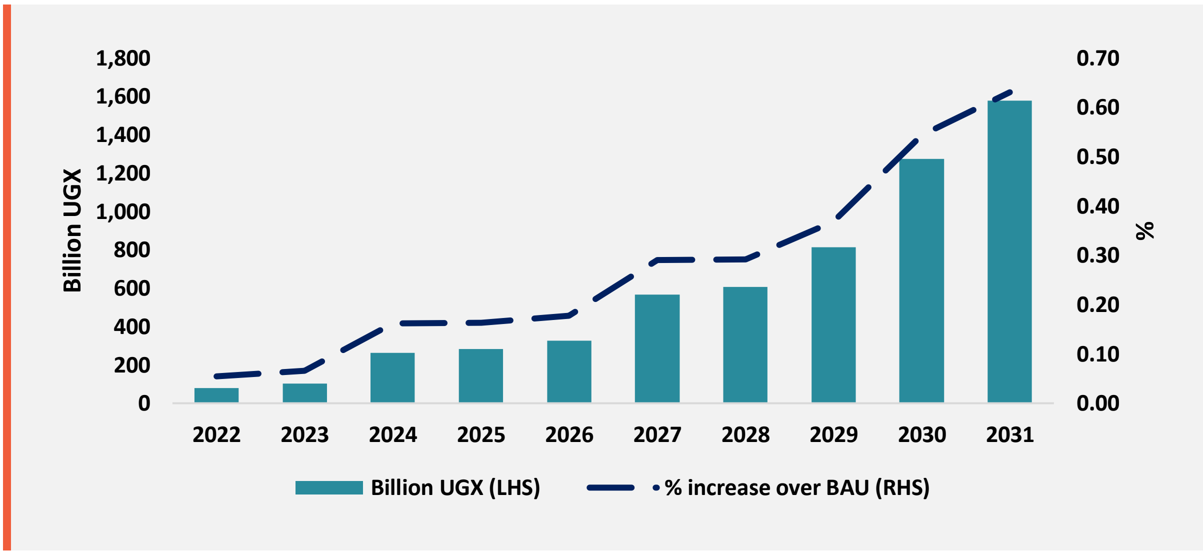
Source: Authors' calculation, ESP DCGE model

7.2.4 Impacts on National Income (GDP)

The most widely used and accepted indicator to measure economic well-being is GDP or national income, which is the sum of values of all goods and services produced in an economy in a particular time period (e.g. usually a quarter or a year). Two valuations of GDP have been used – basic price GDP and market price GDP.[19] All else equal, positive interventions through augmenting household income and consumption are likely to enhance national income through the interdependent system and multipliers. The simulated impacts on GDP are presented below.

Simulated market price GDP gains under the ESP simulations over the BAU values are shown for all the years – 2021/22 to 2030/31 (Figure 40). It also shows the growth in incomes between the BAU scenarios and ESP simulations. National income gain under ESP 1 over BAU 1 (or in FY 2021/22) has been simulated at UGX 79 billion generating a rise over BAU of GDP 0.05 per cent. The income gain increases to UGX 1,576 billion in FY 2030/31. This implies a growth rate of 0.63 per cent.

Figure 40: Gains in Market Price GDP under the ESP simulations over BAU scenarios

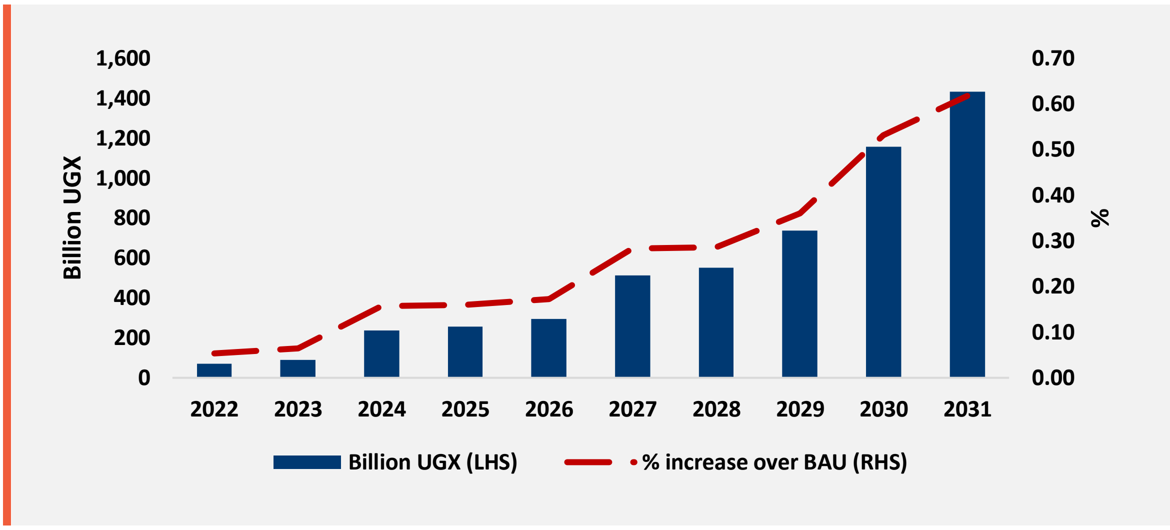


Source: Authors' calculation, ESP DCGE model

Simulated GDP gains in basic price under the ESP simulations, over the BAU values, are shown in Figure 41 for all the years – 2021/22 to 2030/31. Trends in basic price GDP gains are similar to the trend found for the market price GDP gain. In particular, income gain under the ESP 1, over BAU 1 (or in FY 2021/22), has been simulated at UGX 71 billion generating a rise over of BAU GDP 0.05 per cent. The income gain increases to UGX 1,433 billion in FY 2030/31. This implies a growth rate of 0.62 per cent.

[19] **GDP** at **basic prices**: Equals **GDP** at **market prices**, minus taxes and subsidies on products. **GDP** at **market prices**: The gross value at **market prices** of all goods and services produced by the economy, plus taxes but minus subsidies on imports.

Figure 41: Gains in Basic Price GDP under the ESP simulations over BAU scenarios



Source: Authors' calculation, ESP DCGE model

7.2.5 Labour Factor Income Implication

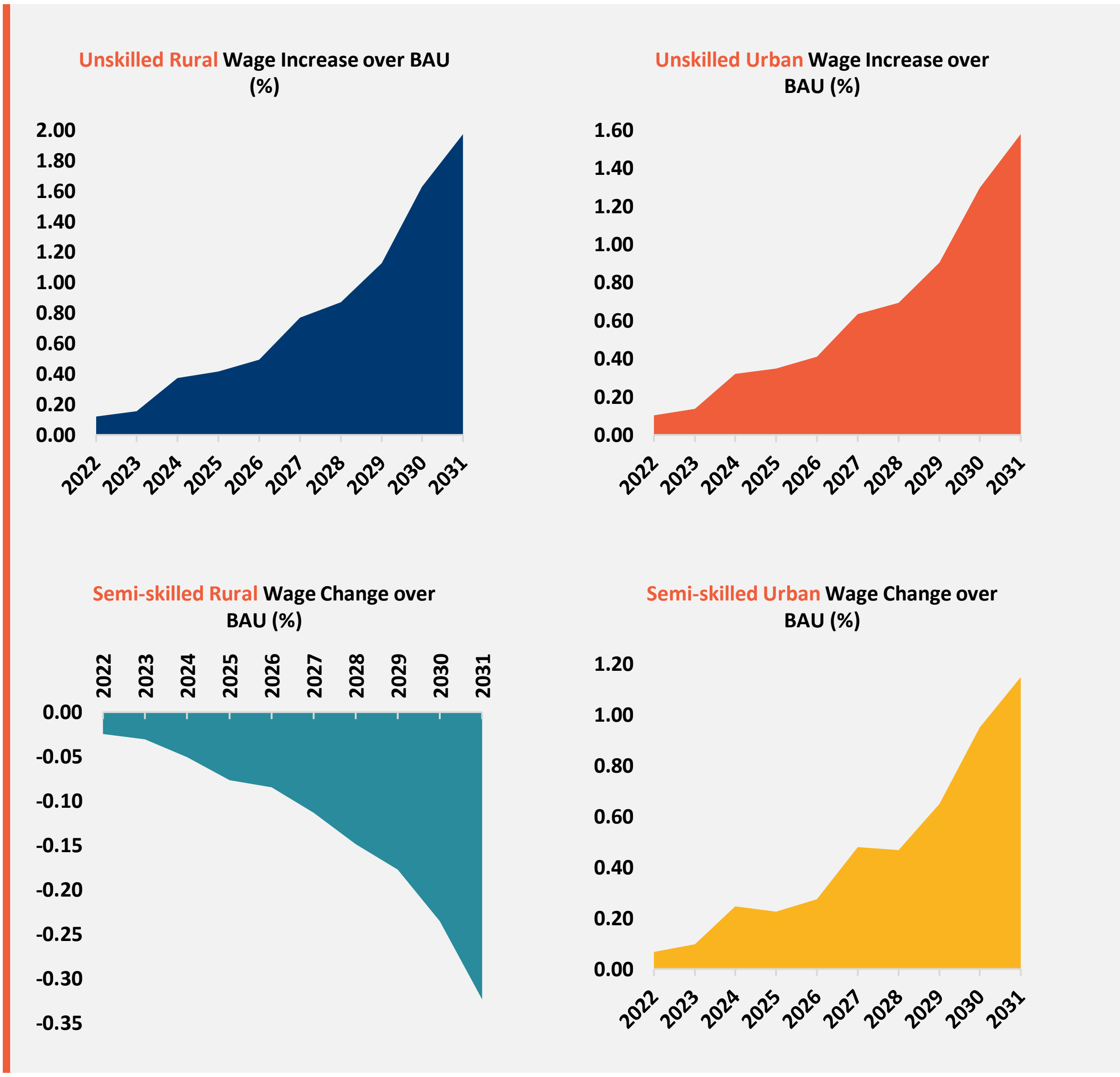
Overall, GDP gain led to an increase in wage rates under the ESP injections, compared to BAU scenarios. The gain in labour factor income (i.e. wage rates) has been positive throughout – 0.02 per cent in 2022 to around 0.33 per cent in 2031.

Table 7: Impacts on rural and urban wage rates (% change over BAU)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Rural wage	0.02	0.03	0.08	0.06	0.08	0.15	0.13	0.20	0.30	0.33
Urban Wage	0.02	0.03	0.08	0.06	0.07	0.14	0.12	0.17	0.26	0.30

However, the gains in wage rates have been not positive for all types of labour factors. The trend gain in wage rates has been captured in Figures 42 and 43 below. A positive wage rate increase has been found for five types of labour factors such as: (i) Unskilled rural workers; (ii) Unskilled urban workers; (iii) Semiskilled urban workers; (iv) Skilled rural workers; and (v) Skilled urban workers.

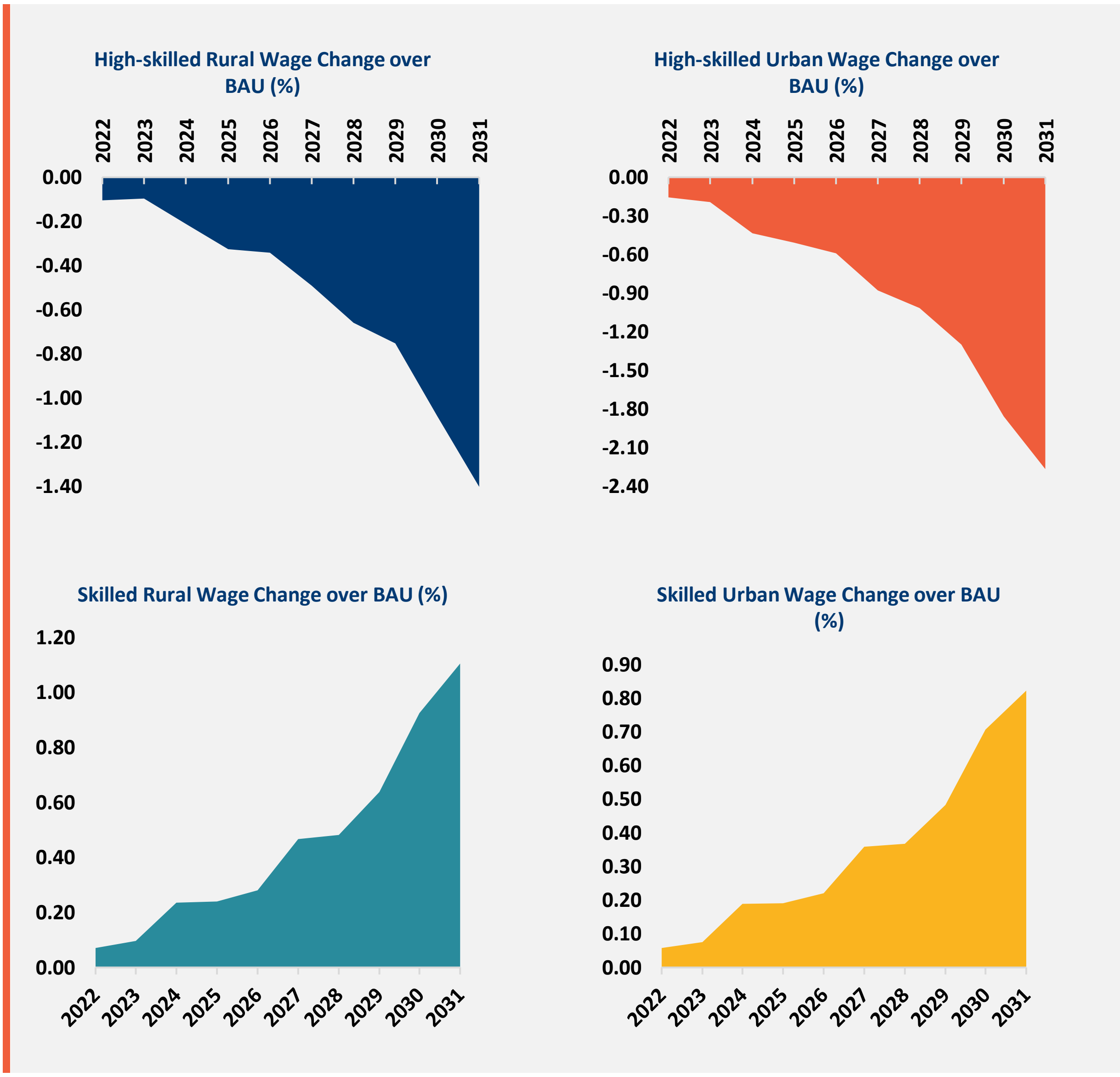
Figure 42: Real income gains under the ESP simulations



Source: Authors' calculation, ESP DCGE model

A decline in wages has been found for three types of workers namely: (i) Semiskilled rural workers; (iv) High skilled rural workers; and (v) High skilled urban workers. Another important outcome is that wage increases are relatively higher for the unskilled workers.

Figure 43: Real income gains under the ESP simulations



Source: Authors' calculation, ESP DCGE model

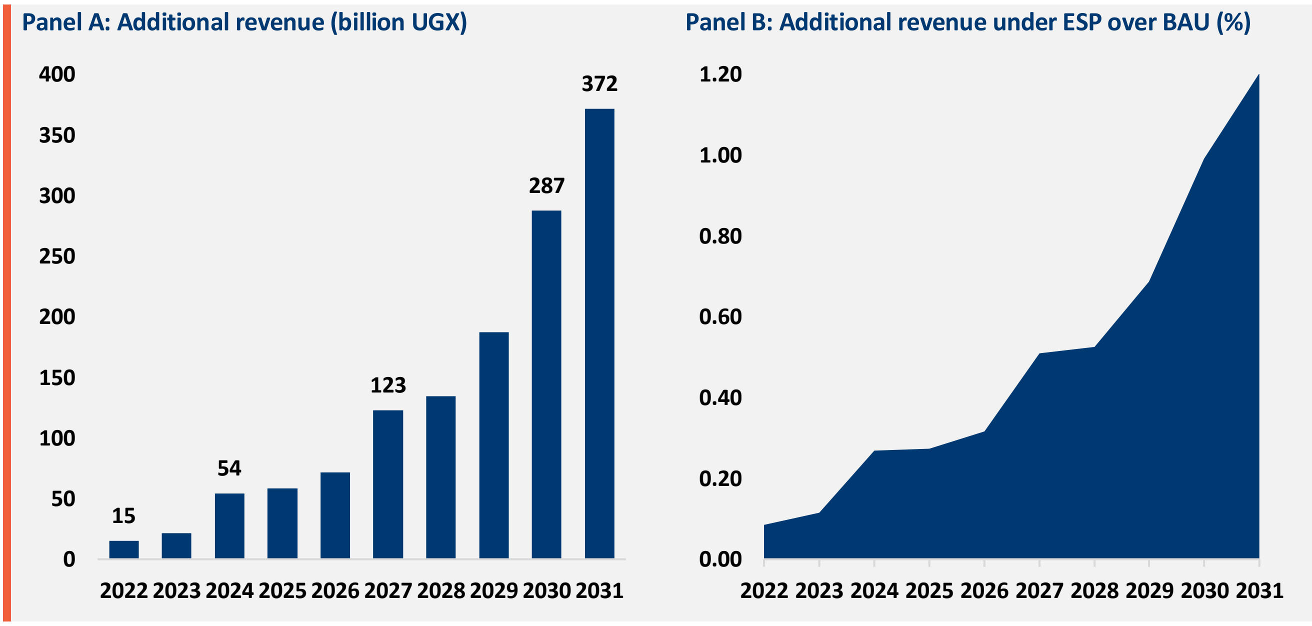
The simulated impacts on wage rates are summarised below:

- ESP interventions have positive impacts on the returns to the labour factors – due to indirect effects from the expansion of the economy;
- Increases in wage rates have been found for both rural and urban workers – although gains are slightly higher for the rural workers;
- Impacts on wage rates are not uniform – in some cases, wage rates have declined even in a situation of overall economic expansion. This implies that some activities have experienced contraction due to ESP injections;
- Wage rates have increased for five types of workers and declined for three types of workers;
- An increase in wage rates has been found relatively higher for unskilled workers (i.e. supplied mainly by poorer household groups), while wage rates declined for high skilled workers (i.e. supplied predominantly by richer household groups) perhaps suggesting a progressive pattern in wage rate gain.

7.2.6 Government Revenue Implication

Both tax rates and tax net[20] have remained unchanged under the simulations. However, as a result of economic expansion, revenue has increased under all the four simulations, albeit to different extent. Since, economic expansion is highest in the scenario of ESP in 2030/31 (ESP 4), largest revenue gain is also found for this scenario. Revenue gain may be as high as UGX 372 billion. Lowest revenue gain of UGX 15 billion has been found for the scenario of ESP in 2021/22. However, additional revenue gains (i.e. autonomous) are not sufficient to cover the ESP budget requirements. The revenue gains under ESP as per cent of BAU revenue has increased from 0.09 per cent in 2021/22 to 1.2 per cent in 2030/31 (Figure 44).

Figure 44: Revenue gains under the ESP simulations



Source: Authors' calculation, ESP SAM model

[20] Legal tax net of the legal tax system.

8 Concluding Observations

A SAM based multiplier model is used to assess the macro-economic and poverty implications of ESP interventions in Uganda. Four simulations have been carried out to assess the impacts of the progressive realisation of expanding current, and introducing new, cash transfer schemes under ESP on household income/consumption, poverty headcount, real and nominal national income and revenue. Simulation outcomes suggest salutary effects of ESP interventions in Uganda.

Furthermore, since ESP is financed through tax revenue, a relevant question is: what is the opportunity cost of ESP funds channelled to households? To assess the opportunity cost issue, an additional simulation where UGX 6,266 billion has been injected into the multiplier model via the construction sector augmenting capital goods of the economy. This simulation has been named as INV 4. The outcomes of INV 4 simulation have been compared with outcomes of the ESP 4 simulation. The findings of the INV 4 simulation exercise suggest that a spending of this scale on ESP schemes would be comparable to macro-economic impacts to a similar investment in other sectors, such as construction.

Social spending was previously considered to be social welfare on a charitable basis. However, the analysis presented here using macro-simulations confirms that social spending (such as ESP) is not a cost to the economy, but rather an investment. Furthermore, there is a comparative advantage in domestic output from agriculture through increased value added to land and labour through investment in a household-level transfer. Similarly, macro-economic modelling finds comparable advantage in terms of increased household consumption. This reinforces the widely acknowledged role of social protection (i.e. pension in this particular case), and in particular cash transfers to beneficiary households, in supporting a consumption-led growth. On the basis of these positive effects, ESP interventions are justified.

The introduction and operationalization of the DCGE model for Uganda is an important addition to the tools available to the Ministry of Finance, Planning and Economic Development (MFPED). In addition to simulating the ESP injections impact, the DCGE model may be used to simulate implications of following important aspects:

- Five-year plan outcome generation – economic growth, sectoral GDP, GFCF, government budget and prices etc;
- Tariff rationalization – changes in tariff rates, and complete elimination of tariff etc;
- Tax composition – changes in domestic tax rates, and introduction of new taxes etc;
- Equity aspects of tax and tariff changes etc;
- Foreign remittances;
- Public and private transfers;
- ODA and external sector transfers.

The DCGE model is a powerful tool for economy-wide analysis and, hence, should be maintained and sustained within the MFPED.

9 Annexes

9.1 Description of SAM Model

9.1.1 Input-output matrix and social accounting matrix

A social accounting matrix (SAM) is an extension (or generalisation) of the input-output matrix by incorporating other parts of the economy – namely primary and secondary income distribution and institutions of an economy. More specifically, Input-output analysis involves constructing a table in which each horizontal row describes how one industry's total product is divided among various production processes and final consumption. Each vertical column denotes the combination of productive resources used within one industry. A table of this type (Figure 45) illustrates the dependence of each industry on the products of other industries: for example, an increase in manufacturing output is also seen to require an increase in the production of power.

Figure 45: Input-output table

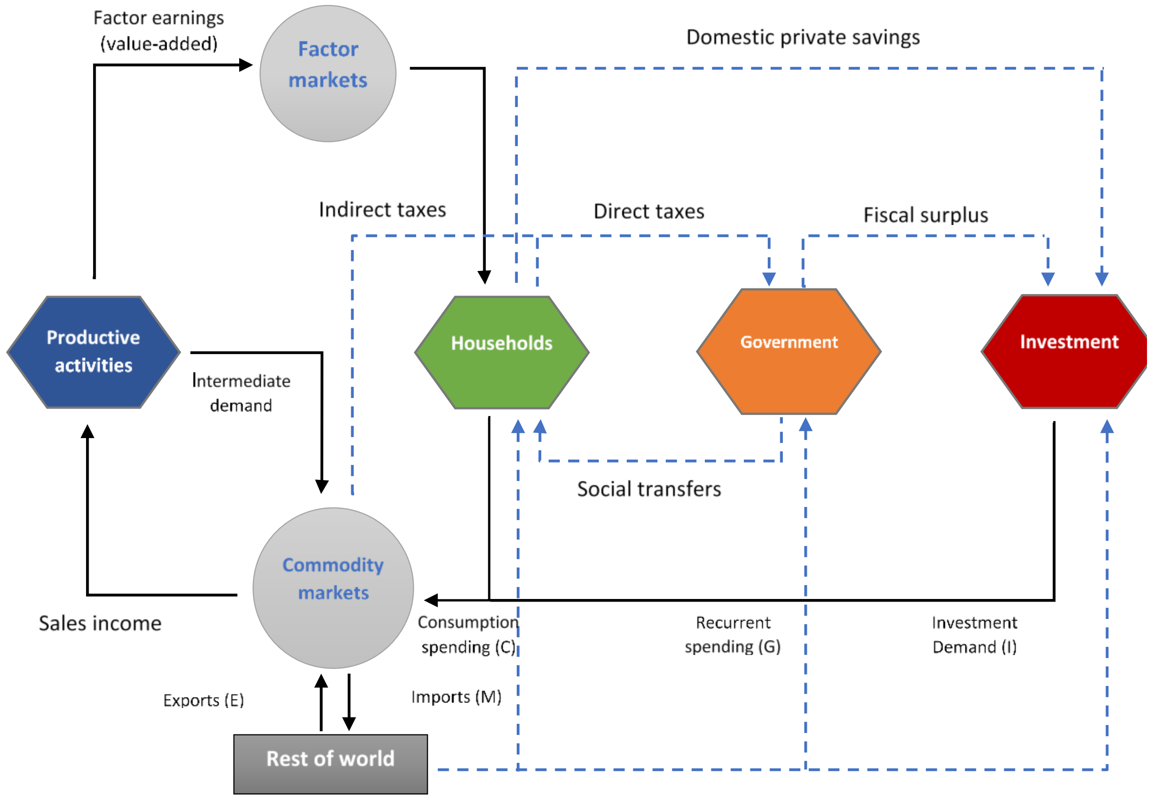
		Activity					Final demand				Total use
		A1	…	…	…	A33	C_p	C_g	I	Ex	
Commodity	C1	Technology matrix (33 x 33)					Final demand				
	..										
	..										
	..										
	C33										
Value adde	Compensation	GDP (Income Approach)					GDP (Expenditure Approach)				
	Operating surplus										
	Indirect taxes										
	Import										
	Total supply										

SAM is a square matrix which captures all the main circular flows (figure below) within an economy in a given period.

Figure 46: Basic structure of a SAM

		Expenditure columns							
		Activities C1	Commodities C2	Factors C3	Households C4	Government C5	Investment C6	Rest of world C7	Total
Income rows	Activities R1		Domestic Supply						Activity income
	Commodities R2	Intermediate demand			Consumption spending (C)	Recurrent spending (G)	Investment demand (I)	Export earnings (E)	Total demand
	Factors R3	Value-added							Total factor income
	Households R4			Factor payments to households		Social transfers		Foreign remittances	Total household income
	Government R5		Sales taxes and import tariffs		Direct taxes			Foreign grants and loans	Government income
	Savings R6				Private savings	Fiscal surplus		Current account balance	Total savings
	Rest of world R7		Import payments (M)						Foreign exchange outflow
	Total	Gross output	Total supply	Total factor spending	Total household spending	Government expenditure	Total investment spending	Foreign exchange inflow	

Figure 47: Circular flow in an Economy



Source: Breisinger et al. (2009)

The input-output part of SAM captures production linkages between sectors that are determined by those sectors' production technologies. These linkages can be differentiated into backward and forward linkages. Stronger forward and backward production linkages lead to larger multipliers.

Backward production linkages are the demand for additional inputs used by producers to supply additional goods or services. For example, when electricity production expands, it demands intermediate goods like fuel, machinery and construction services. This demand then stimulates production in other sectors to supply these intermediate goods. The more input-intensive a sector's production technology is, the stronger its backward linkages are.

Forward production linkages account for the increased supply of inputs to upstream industries. For example, when electricity production expands, it can supply more power to the economy, which stimulates production in all the sectors that use power. Thus, the more important a sector is for upstream industries, the stronger its forward linkages will be. Forward linkages are particularly important for the energy sector, as it provides key inputs into the majority of other sectors in the economy.

9.1.2 Methodology – description of social accounting matrix model

The move from a SAM data framework to a SAM model (also known as a multiplier framework) requires decomposing the SAM accounts into 'exogenous' and 'endogenous'. Generally, accounts intended to be used as policy instruments (for example, government expenditure, including social protection, investment and exports) are made exogenous and accounts specified as objectives or targets must be made endogenous (for example, output, commodity demand, factor return, and household income or expenditure). For any given injection into the exogenous accounts of the SAM, influence is transmitted through the interdependent SAM system among the endogenous accounts.

The interwoven nature of the system implies that the incomes of factors, households and production are all derived from exogenous injections into the economy via a multiplier process. The multiplier process is developed here on the assumption that when an endogenous income account receives an exogenous expenditure injection, it spends it in the same proportions as shown in the matrix of average propensities to spend (APS). The elements of the APS matrix are calculated by dividing each cell by the sum total of its corresponding column.

The economy-wide impacts of personal income loss are examined by changing the household consumption vector.

Table 8: Description of the endogenous and exogenous accounts and multiplier effects

Endogenous (y)	*Exogenous (x)*
The activity (gross output multipliers), indicates the total effect on the sectoral gross output of a unit-income increase in a given account, *i* in the SAM, and is obtained via the association with the commodity production activity account *i*.	
The consumption commodity multipliers, which indicates the total effect on the sectoral commodity output of a unit-income increase in a given account *i* in the SAM, is obtained by adding the associated commodity elements in the matrix along the column for account *i*.	Intervention into through activities (x = c + i + g + e), where i= GFC + ST (GFCF) Household Consumption (c) Exports (e) Government Expenditure (g) Investment Demand (i) Inventory Demand (i)
The value-added, or GDP multiplier, giving the total increase in GDP resulting from the same unit-income injection, is derived by summing up the factor-payment elements along account *i*'s column.	

The shift from a 'data' SAM structure to a SAM multiplier module requires the introduction of assumptions and the separation of the SAM accounts into 'exogenous' and 'endogenous' components.[21]

Table 9: General SAM modular structure

			1a-PA	*1b-CM*	*2-FP*	*3a-HH-OI*	*4-KHH-OI*	*5-ROW*	*TDD*
1a		PA		$T_{1a, 1b}$		0			Y_{1a}
1b		CM	$T_{1b, 1a}$			$T_{1b, 3}$	$T_{1b, 4}$	$T_{1b, 5}$	Y_{1b}
2		FP	$T_{2, 1a}$					$T_{2, 5}$	Y_2
3		HH-IO	$T_{3, 1a}$	$T_{3, 1b}$	$T_{3, 2}$	$T_{3, 3}$		$T_{3, 5}$	Y_3
4		KHH-OI	$T_{4, 1a}$			$T_{4, 3a}$		$T_{4, 5}$	Y_4
5		ROW		$T_{5, 1b}$	$T_{5 2}$	$T_{5, 3}$	0	0	Y_5
		TSS	E_{1a}	E_{1b}	E_2	E_3	E_4	E_5	

[21] This methodology follows Pyatt, G and JI Round (1977), 'Social Accounting Matrices for Development Planning', *Review of Income and Wealth*, Series 23 No.4; Pyatt, G and JI Round (1979), 'Accounting and Fixed Price Multipliers in a SAM Framework', *Economic Journal*, No. 89; and Pyatt, G and A Roe (1987), (eds.). The layout follows Alarcon, JV et al. (1984), *La Matriz de Insumo-ProductoAdaptadapara la Planificación de lasnecesidadesbásicas,* Ecuador 1975 y 1980, ISSPREALC, Quito; and Alarcon, JV et al. (1991), *The Social Accounting Framework for Development*, Gower House, Avebury.

Note: Where: by definition $Y_i = E_j$ and 1 Production (1a PA = Production activities and 1b CM = Commodities); 2 FP = Factors of Production; 3 HH-IO = Households and Other Institutions (incl. Government); 4 KHH-OI = Capital Account Households and Other Institutions (including government); 5 ROW = Rest of the World (current and capital account). Blank entries indicate that there are no transactions by definition.

The separation is needed to enter the system, allowing some variables within the SAM structure to be manipulated exogenously (via injection instruments) to assess the subsequent impacts on the endogenous accounts, as well as on the exogenous accounts.

Generally, accounts intended to be used as policy instruments are classified as exogenous and accounts specified a priory as objectives (or targets) are classified as endogenous. Two accounts are designated as endogenous accounts: 1) Production (production activities and commodities) account; 2) and Factors of Production account.

The exogenous accounts comprise: 3a Household (consumption), Government (expenditure, transfer, remittances); 4 Capital account of institutions (savings and demand for houses, investment demand, infrastructure and machinery and equipment); and 5 ROW transfers, remittances, export demand and capital. The SAM flows and the categorisation into endogenous and exogenous accounts are shown in Table below.

Table 10: SAM accounts

		1a-PA	*1b-CM*	*2-FP*	*3a-HH-OI*	*3b-Gov*	*4-KHH-OI*	*5-ROW*	*TDD*
1a	PA		$T_{1a, 1b}$		0				Y_{1a}
1b	CM	$T_{1b, 1a}$			$T_{1b, 3a}$	$T_{1b, 3b}$	$T_{1b, 4}$	$T_{1b,5}$	Y_{1b}
2	FP	$T_{2, 1a}$						$T_{2, 5}$	Y_2
3a	HH-OI			$T_{3a, 2}$	$T_{3a, 3a}$	$T_{3a, 3b}$		$T_{2, 5}$	Y_3
3b	Gov	$T_{3b, 1a}$	$T_{3b, 1b}$		$T_{3b, 3a}$	$T_{3b, 3b}$		$T_{3a, 5}$	
4	KHH-OI	$T_{4, 1a}$			$T_{4, 3}$			$T_{4, 5}$	Y_4
5	ROW		$T_{5, 1b}$	$T_{5, 2}$	$T_{5, 3a}$	$T_{5, 3b}$	$T_{5, 4}$	0	Y_5
	TSS	E_{1a}	E_{1b}	E_2	E_{3a}	E_{3b}	E_4	E_5	

Note: Where Endogenous: 1 Production (1a PA = Production Activities and 1b CM = Commodities); 2 FP = Factors of Production; 3a HH = Households and Other Institutions (excluding Government). Where Exogenous: 3b Government; 4 KHH-OI = Capital Account of Households and of Other Institutions (incl. government); 5 ROW = Rest of the World (current and capital account). Blank entries indicate that there are no transactions by definition.

Table 11: Endogenous and components of exogenous accounts

	PA	CM	FP	EXO	INCOME	Exogenous Accounts (EXO) used as injections Column Vectors
1a PA		$T_{1a\,1b}$		X_{1a}	Y_{1a}	$X_{1a} = 0$
1b CM	$T_{1b\,1a}$			X_{1b}	Y_{1b}	X_{1b} = Government Consumption Subsidies - Taxes + Exports + Gov. Investment (capital formation in infrastructure and machinery and equipment) + Gross Capital Stock formation
2 FP	$T_{2\,1a}$			X_2	Y_2	X_2 =Factor Remittances from ROW
3b-5 Leaks	L_{1a}	L_{1b}	L_2	$L_{3b\text{-}5} = X_{3b\text{-}5}$	$Y_{3b\text{-}5}$	3b =Aid to Government from ROW
EXPN	E_{1a}	E_{1b}	E_2	$E_{3b\text{-}5}$		Where $E_i = Y_j$
L_{1a} = Activity Tax					L_{3a} = Income Tax + Household Savings + Corporate Savings	
L_{1b} = Commodity Tax + Import Duty + Imports					$L_{3b\text{-}5}$ $X_{3b\text{-}5}$ and $Y_{3b\text{-}5}$ falls out of the model	
L_2 = Factor Remittances to ROW					Blank entries indicate that there are no transactions by definition.	

Note on injection: For any given injection into the exogenous accounts X_i (i.e., instruments) of the SAM, influence is transmitted through the interdependent SAM system among the endogenous accounts. The interwoven nature of the system implies that the incomes of factors, institutions and production are all derived from exogenous injections into the economy via a multiplier process. Multiplier models may also be built on the input-output frameworks. The main *shortcoming of the IO model is that the feedback between factor income generation (value-added) and demand by private institutions (households) does not exist. In this case, the circular economic flow is truncated. The problem can be partly tackled by endogenising household consumption within the I-O framework; this is typically referred to as a 'closed I-O model'. In this case, the circular economic flow is only partially truncated. A better solution is to extend the I-O to a SAM framework, which captures the full circular economic flow derivation of SAM multipliers*

SAM coefficients (A_{ij}) are derived from payment flows by endogenous accounts to themselves (T_{ij}) and other endogenous accounts as to the corresponding outlays ($E_i = Y_j$); similarly, the leak coefficients (B_{ij}) are derived from flows reflecting payments from endogenous accounts to exogenous accounts. They are derived in Table below.

Table 12: Coefficient matrices and vectors of the SAM model

Account	1a – PA	1b – CM	2 - FP	3a … 5 EXO	Income
1a – PA		$A_{1a,1b} = T_{1a,1b}/ Y_{1b}$		X_{1a}	Y_{1a}
1b – CM	$A_{1b,1a} = T_{1b,1a}/ Y_{1a}$			X_{1b}	Y_{1b}
2 – FP	$A_{2,1a} = T_{2,1a}/ Y_{1a}$			X_2	Y_2
3a … 5 Leaks	$B_{1a} = L_{1a} / Y_{1a}$	$B_{1b} = L_{1b} / Y_{1b}$	$B_2 = L_2/ Y_2$		
Expenditure	$E_{1a} = Y_{1a}$	$E_{1b} = Y_{1b}$	$E_2 = Y_2$		

The multiplier analysis using the SAM framework helps us to understand the linkages between the different sectors and the institutional agents at work within the economy. Accounting multipliers are calculated according to the standard formula for accounting (impact) multipliers, as follows:

$$Y(t) = A\,Y(t) + X(t) = (I - A)^{-1} X(t) = M_a X(t)$$

where:

- t is time
- Y is a vector of incomes of endogenous variables
- X is a vector of expenditures of exogenous variables
- A is the matrix of average expenditure propensities for endogenous accounts

$M_a = (I - A)^{-1}$ is a matrix of aggregate accounting multipliers (generalised Leontief inverse).

The aggregate accounting multiplier (M_a) is then further decomposed to separately examine the direct and induced effect. In order to generate the direct and induced effects, the M_a multiplier is decomposed using both multiplicative and additive forms.

From the above, it logically follows that the SAM model mainly provides answers to following basic issues:

I. the impacts on the endogenous and exogenous accounts in a clear and differentiated manner;
II. the technological structure of the sectors oriented towards the production of basic intermediate and final goods and services;

III. the expenditure structures of factors of production, institutions and demand for goods and services of domestic and foreign origin;
IV. the identification of key sectors, commodities, factors of production, institutional accounts and basic needs in the economy and quantification of the main linkages (total and partial);
V. the dynamics of the production structure, factorial and institutional income formation;
VI. the effects of incomes of institutions and their impact on production via their corresponding demand;
VII. the intra, across or extra and inter-circular group effects, both in additive and multiplicative manner;
VIII. how matching labour and investment requirements can be calculated;
IX. price changes on endogenous accounts arising out of endogenous account price changes, as well as exogenous account price changes;
X. design simulations and alternative scenario and perform analysis; and
XI. it serves as the basis for development of computable general equilibrium**.**

9.2 Description of ESP Simulation

Table 13: Distribution of SCG by household groups (Billion UGX)

Household Groups	ESP 1	ESP 2	ESP 3	ESP 4
	2021/22	2023/24	2026/27	2030/31
CRAg04	3.1	11.0	14.0	21.6
CRAg514	4.8	17.0	21.7	33.4
CRAg1529	6.3	22.2	28.2	43.5
CRAg3064	5.3	18.5	23.6	36.3
CRAg65+	4.8	17.0	21.6	33.3
CUAg04	0.5	1.9	2.4	3.8
CUAg514	1.5	5.4	6.9	10.6
CUAg1529	1.3	4.5	5.8	8.9
CUAg3064	1.3	4.7	6.0	9.2
CUAg65+	4.1	14.5	18.4	28.3
ERAg04	11.6	40.9	52.1	80.2
ERAg514	10.5	37.0	47.0	72.4
ERAg1529	9.1	32.0	40.7	62.7
ERAg3064	8.7	30.8	39.1	60.3
ERAg65+	4.1	14.5	18.5	28.4
EUAg04	1.3	4.7	6.0	9.3
EUAg514	1.2	4.3	5.5	8.4
EUAg1529	0.7	2.5	3.1	4.8
EUAg3064	1.2	4.3	5.5	8.5
EUAg65+	1.2	4.3	5.5	8.5
NRAg04	7.7	27.1	34.5	53.1
NRAg514	6.9	24.2	30.8	47.4
NRAg1529	5.9	20.8	26.4	40.7
NRAg3064	5.7	20.1	25.5	39.3
NRAg65+	3.4	11.9	15.1	23.3
NUAg04	0.4	1.3	1.6	2.5
NUAg514	0.6	2.2	2.9	4.4
NUAg1529	1.1	4.1	5.2	7.9
NUAg3064	0.7	2.5	3.2	4.9
NUAg65+	1.2	4.3	5.4	8.4
WRAg04	2.7	9.6	12.2	18.8
WRAg514	5.8	20.5	26.1	40.2
WRAg1529	9.0	31.6	40.2	61.9
WRAg3064	9.7	34.3	43.7	67.2
WRAg65+	11.1	39.0	49.6	76.4
WUAg04	0.6	2.2	2.8	4.3
WUAg514	1.4	5.0	6.3	9.7
WUAg1529	1.7	5.9	7.5	11.6
WUAg3064	1.2	4.3	5.4	8.4
WUAg65+	1.6	5.7	7.2	11.2
Total	161.25	568.68	723.47	1,114.00

Table 14: Distribution of Disability Benefit by household groups (Billion UGX)

Household Groups	ESP 1 2021/22	ESP 2 2023/24	ESP 3 2026/27	ESP 4 2030/31
CRAg04	0.0	0.6	5.9	8.8
CRAg514	0.0	6.8	25.9	38.3
CRAg1529	0.0	6.8	33.5	49.5
CRAg3064	0.0	5.9	33.6	49.6
CRAg65+	0.0	5.5	20.8	30.7
CUAg04	0.0	0.0	1.1	1.7
CUAg514	0.0	0.0	1.5	2.2
CUAg1529	0.0	0.0	2.5	3.7
CUAg3064	0.0	2.0	11.1	16.5
CUAg65+	0.0	8.5	35.9	53.0
ERAg04	0.0	6.4	27.8	41.2
ERAg514	0.0	11.5	46.5	68.8
ERAg1529	0.0	9.7	27.4	40.6
ERAg3064	0.0	6.0	18.3	27.1
ERAg65+	0.0	1.7	4.0	5.9
EUAg04	0.0	1.3	1.9	2.8
EUAg514	0.0	0.0	0.3	0.4
EUAg1529	0.0	0.0	0.7	1.1
EUAg3064	0.0	0.3	4.3	6.3
EUAg65+	0.0	0.3	6.3	9.3
NRAg04	0.0	15.0	50.5	74.7
NRAg514	0.0	9.1	19.6	29.0
NRAg1529	0.0	4.1	7.4	10.9
NRAg3064	0.0	3.9	7.4	10.9
NRAg65+	0.0	1.2	2.8	4.1
NUAg04	0.0	1.9	4.6	6.7
NUAg514	0.0	0.7	2.0	2.9
NUAg1529	0.0	0.4	1.5	2.2
NUAg3064	0.0	0.4	1.6	2.3
NUAg65+	0.0	1.4	4.6	6.9
WRAg04	0.0	5.1	13.4	19.9
WRAg514	0.0	17.5	52.9	78.2
WRAg1529	0.0	15.1	65.9	97.5
WRAg3064	0.0	12.5	47.6	70.4
WRAg65+	0.0	3.2	18.5	27.4
WUAg04	0.0	0.6	2.1	3.1
WUAg514	0.0	1.3	3.4	5.0
WUAg1529	0.0	3.9	12.1	17.9
WUAg3064	0.0	3.2	10.8	16.0
WUAg65+	0.0	5.5	15.2	22.6
Total	0.00	179.23	653.34	966.41

Table 15: Distribution of Child Benefit by household groups (Billion UGX)

Household Groups	ESP 1 2021/22	ESP 2 2023/24	ESP 3 2026/27	ESP 4 2030/31
CRAg04	0.0	0.0	8.5	64.5
CRAg514	0.0	0.0	11.7	100.6
CRAg1529	0.0	0.0	17.5	134.8
CRAg3064	0.0	0.0	23.7	184.6
CRAg65+	0.0	0.0	18.8	155.2
CUAg04	0.0	0.0	2.2	16.0
CUAg514	0.0	0.0	4.0	37.5
CUAg1529	0.0	0.0	9.4	81.6
CUAg3064	0.0	0.0	17.5	143.6
CUAg65+	0.0	0.0	34.2	278.7
ERAg04	0.0	0.0	41.3	315.0
ERAg514	0.0	0.0	33.0	264.4
ERAg1529	0.0	0.0	23.0	179.6
ERAg3064	0.0	0.0	12.6	96.9
ERAg65+	0.0	0.0	4.5	36.0
EUAg04	0.0	0.0	3.4	27.8
EUAg514	0.0	0.0	3.2	28.8
EUAg1529	0.0	0.0	4.1	33.3
EUAg3064	0.0	0.0	3.4	30.8
EUAg65+	0.0	0.0	3.2	27.0
NRAg04	0.0	0.0	30.7	240.7
NRAg514	0.0	0.0	24.2	186.1
NRAg1529	0.0	0.0	19.6	153.0
NRAg3064	0.0	0.0	14.4	107.6
NRAg65+	0.0	0.0	8.0	59.7
NUAg04	0.0	0.0	2.2	16.3
NUAg514	0.0	0.0	2.2	18.0
NUAg1529	0.0	0.0	3.1	25.2
NUAg3064	0.0	0.0	3.4	31.9
NUAg65+	0.0	0.0	4.8	39.7
WRAg04	0.0	0.0	13.8	104.8
WRAg514	0.0	0.0	21.4	160.3
WRAg1529	0.0	0.0	25.7	203.7
WRAg3064	0.0	0.0	27.4	229.4
WRAg65+	0.0	0.0	18.7	170.6
WUAg04	0.0	0.0	1.0	9.6
WUAg514	0.0	0.0	3.3	27.4
WUAg1529	0.0	0.0	4.4	32.7
WUAg3064	0.0	0.0	7.6	59.4
WUAg65+	0.0	0.0	9.3	72.6
Total	0.00	0.00	524.56	4,185.40

9.3 Projected BAU Nominal and Real GDP values

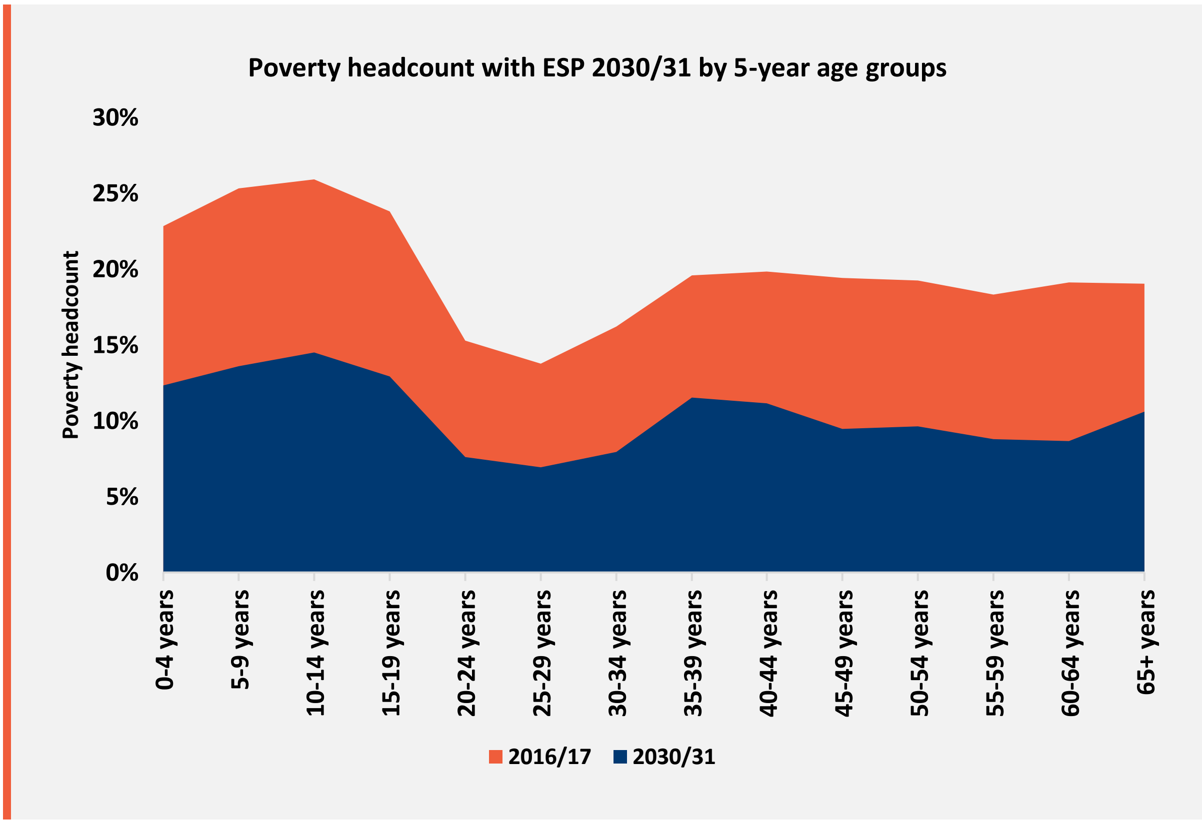
Table 16: Projected Nominal GDP Values by SAM Activities (Billion UGX)

Activity Description	2021/22	2023/24	2026/27	2030/31
Cash crops	3,122	3,412	4,283	5,786
Food crops	20,368	22,256	27,937	37,742
Livestock	6,450	7,049	8,848	11,953
Agriculture Support Services	55	61	76	103
Forestry	5,352	5,849	7,341	9,918
Fishing	2,450	2,678	3,361	4,541
Mining & quarrying	1,150	1,369	1,970	3,227
Processed Food	6,492	7,730	11,118	18,213
Beverage and Tobacco	1,295	1,542	2,218	3,633
Textile	896	1,067	1,534	2,514
Furniture	1,367	1,627	2,341	3,834
Chemical Product	1,703	2,028	2,917	4,779
Plastic	422	503	723	1,184
Cement	672	800	1,151	1,886
Metal	1,191	1,417	2,039	3,340
Other Manufacturing	1,003	1,195	1,718	2,815
Electricity	1,716	2,043	2,939	4,815
Water	4,879	5,809	8,355	13,688
Construction	12,811	15,253	21,938	35,940
Trade and Repairs	21,097	24,841	34,918	54,400
Transportation and Storage	5,222	6,149	8,643	13,465
Accommodation and Food Service Activities	4,816	5,671	7,971	12,419
Information and Communication	3,895	4,586	6,446	10,043
Financial and Insurance Activities	5,786	6,813	9,577	14,920
Real Estate Activities	7,936	9,344	13,135	20,463
Professional, Scientific and Technical Activities	4,399	5,180	7,281	11,344
Administrative and Support Service Activities	2,475	2,914	4,097	6,382
Public Administration	5,386	6,342	8,914	13,888
Education	12,748	15,010	21,099	32,871
Human Health and Social Work Activities	5,452	6,420	9,024	14,059
Arts, Entertainment and Recreation	449	529	744	1,158
Other Service Activities	2,314	2,725	3,830	5,968
Activities of Households as Employers	577	679	955	1,488
Total	**155,951**	**180,892**	**249,441**	**382,779**

Table 17: Projected Real GDP Values by SAM Activities

Activity Description	2021/22	2023/24	2026/27	2030/31
Cash crops	1,534	1,636	1,780	2,031
Food crops	10,145	10,822	11,775	13,433
Livestock	3,174	3,385	3,683	4,202
Agriculture Support Services	0	0	0	0
Forestry	3,150	3,361	3,656	4,171
Fishing	935	998	1,086	1,239
Mining & quarrying	2,724	3,195	3,839	5,188
Processed Food	3,240	3,735	4,792	6,663
Beverage and Tobacco	646	745	956	1,329
Textile	447	515	661	920
Furniture	682	786	1,009	1,403
Chemical Product	850	980	1,257	1,748
Plastic	216	249	320	445
Cement	344	397	509	708
Metal	610	703	902	1,254
Other Manufacturing	514	592	760	1,057
Electricity	901	1,038	1,332	1,854
Water	1,928	2,222	2,852	3,969
Construction	6,645	7,660	9,829	13,681
Trade and Repairs	10,987	12,627	15,477	20,446
Transportation and Storage	3,088	3,549	4,350	5,746
Accommodation and Food Service Activities	2,286	2,627	3,220	4,254
Information and Communication	8,170	9,390	11,509	15,203
Financial and Insurance Activities	2,996	3,444	4,221	5,576
Real Estate Activities	5,597	6,433	7,885	10,416
Professional, Scientific and Technical Activities	2,365	2,718	3,331	4,400
Administrative and Support Service Activities	1,403	1,612	1,976	2,610
Public Administration	3,514	4,039	4,950	6,539
Education	5,803	6,669	8,174	10,798
Human Health and Social Work Activities	2,924	3,360	4,118	5,441
Arts, Entertainment and Recreation	253	291	357	472
Other Service Activities	1,141	1,311	1,607	2,123
Activities of Households as Employers	450	517	634	838
Total	**89,663**	**101,607**	**122,809**	**160,156**

9.4 Simulated Poverty Outcomes by Age Groups



9.5 Description of DCGE Model

9.6 Static Module of the DCGE Model

Production bloc

The equations of the production bloc are provided below. The description of the variables and parameters is provided below.

(1) $$XS_j = Min\left[\frac{CI_j}{io_j}, \frac{VA_j}{v_j}\right]$$

(2) $$VA_j = A_j^{KL}\left[\propto_i^{KL} LD_i^{-\rho_i^{kl}} + (1 - \propto_i^{KL})KD_i^{-\rho_i^{kl}}\right]^{-1/\rho_i^{KL}}$$

(3) $$LD_i = A_i^{LL}\left[\propto_i^{LL} QL_i^{-\rho_i^{LL}} + (1 - \propto_i^{LL})NQL_i^{-\rho_i^{LL}}\right]^{-1/\rho_i^{LL}}$$

(4) $$CI_j = io_j XS_j$$

(5) $$DI_{i,j} = aij_{i,j} CI_j$$

(6) $$LD_i = \left(\frac{\alpha_i^{KL}}{1-\alpha_i^{KL}}\right)^{\sigma_i^{KL}} \left(\frac{r_i}{w_i}\right)^{\sigma_i^{KL}} KD_i$$

(7) $$NQL_i = \left(\frac{\alpha_i^{LL}}{1-\alpha_i^{LL}}\right)^{\sigma_i^{LL}} \left(\frac{wq}{wnq}\right)^{\alpha_i^{LL}} QL_i$$

Income and demand bloc

The equations are provided below:

(8) $$P_{index}TH_{h,hj} + P_{index}TWH_h + DIV_h$$

(9) $$YH_h = \lambda_h^{WQ}.wq\sum_j QL_j + \lambda_h^{WQN}.\sum_j NQL_j + \lambda_h^R \sum_{nag} r_{nag} KD_{nag} + \lambda_h^L.\sum_{ag} r_{ag} KD_{ag} + P_{index}TG_h$$

(10) $$YDH_h = YH_h - DTH_h$$

(11) $$SH_h = v.\psi_h.YDH_h$$

(12) $$YF = \lambda^{RF}\sum_i r_i KD_i + \lambda^{LF}.rl.LAND$$

(13) $$SF = YF - \sum_h DIV_h - e.DIV^{ROW} - DTF$$

(14) $$YG = \sum_i TI_i + \sum_i TIE_i + \sum_i DTH_h + DTF$$

(15) $$SG = YG - G - PINDEX\sum_h TG_h$$

(16) $$TI_i = tx_i(P_i XS_i - PE_i EX_i) + tx_i(1 + tm_i).e.PWM_i M_i$$

(17) $$TIM_i = tm_i e.PWM_i M_i$$

(18) $$TIE_i = te_i PE_i EX_i$$

(19) $$DTH_h = tyh_h YH_h$$

(20) $DTF = tyf.YF$

International Trade

The equations are provided below:

(21) $XS_i = B_i^E \left[\beta_i^E EX_i^{k_i^E} + (1 + \beta_i^E) D_i^{k_i^E} \right]^{\frac{1}{k_i^B}}$

(22) $EX_i = \left[\left(\frac{PE_i}{PL_i} \right) \left(\frac{1-\beta_i^E}{\beta_i^E} \right) \right]^{\tau_i^E} D_i$

(23) $EXD_i = EXD_i^o . \left(\frac{PWE_i}{PE\_FOB_i} \right)^{elast_i}$

(24) $Q_i = A_i^M \left[\alpha_i^M M_i^{-\rho_i^M} + (1 - \alpha_i^M) D_i^{-\rho_i^M} \right]^{\frac{-1}{\rho_i^M}}$

(25) $M_i = \left[\left(\frac{PD_i}{PM_i} \right) \left(\frac{\alpha_i^M}{1-\alpha_i^M} \right) \right]^{\sigma_i^M} D_i$

(26) $CAB = \sum_i PWM_i M_i + \lambda^{ROW} \sum_i r_i KD_i / e + DIV^{ROW} - \sum_i PE_{FOB_i} EX_i$

Price blocs

The prices equations are provided below. The nominal exchange rate is the numéraire in each period.

(27) $PV_j = \frac{P_j XS_j - \sum_i PC_i DI_{i,j}}{VA_j}$

(28) $r_i = \frac{PV_i VA_i - w_i LD_i}{KD_i}$

(29) $w_i = \frac{wq.QL_i - wnq.NQL_i}{LD_i}$

(30) $PD_i = (1 + tx_i) PL_i$

(31) $PM_i = (1 + tx_i).(1 + tm_i).e.PWM_i$

(32) $PE_i = \frac{e.PE\_FOB_i}{1+te_i}$

(33) $PC_i Q_i = PD_i D_i + PM_i M_i$

(34) $P_i XS_i = PL_i D_i + PE_i EX_i$

(35) $P_{inv} = \prod_i \left(\frac{PC_i}{\mu_i} \right)^{\mu_i}$

(36) $P_{index} = \sum_i \delta_i PV_i$

Equilibrium Condition

The equations are provided below:

(37) $Q_i = DIT_i + \sum_h C_{i,h} + INV_i + Dstk_i$

(38) $EX_i = EXD_i$

(39) $LSQ = \sum_j QL_j$

(40) $LSNQ = \sum_j NQL_j$

(41) $IT + \sum_i PC_i Dstk_i = \sum_h SH_h + SF + SG + e.CAB$

9.7 Dynamic Module of the DCGE Model

The equations of the dynamic bloc are provided below.

(42) $KD_{i,t+1} = (1 - \delta)KD_{i,t} + Ind_{i,t}$

(43) $LSQ_{t+1} = (1 + ng).LSQ_t$

(44) $LSNQ_q = (1 + ng).NQL_t$

(45) $C_{i,h,t+1}^{min} = (1 + ng)C_{i,h,t}^{min}$

(46) $\frac{Ind_{i,t}}{KD_{i,t}} = A_i^{IK}\left(\frac{R_{i,t}}{U_{i,t}}\right)^2$

(47) $U_{i,t} = Pinv_t(ir + \delta_i)$

(48) $IT_t = Pinv_t.\sum_i Ind_{i,t}$

(49) $SG_{t+1} = (1 + ng)SG_t$

(50) $CAB_{t+1} = (1 + ng)CAB_t$

(51) $TG_{t+1} = (1 + ng)TG_i$

(52) $CG_{t+1} = (1 + ng)CG_t$

(53) $Dstk_{t+1} = (1 + ng)Dstk_t$

(54) $DIV_{t+1} = (1 + ng)DIV_t$

(55) $DIV\_ROW_{t+1} = (1 + ng)DIV\_ROW_t$

(56) $TWH_{t+1} = (1 + ng)TWH_t$

(57) $TH_{h,hj,t+1} = (1 + ng)TH_{h,hj,t}$

(58) $EXD_{t+1}^o = (1 + ng)EXD_t^o$

Description of the Variables and Parameters of the Dynamic CGE Model

Endogenous variables

$C_{i,h}$	Household *h*'s consumption of good *i* (volume)
CF	Composite agricultural capital-labor factor (volume)
CI_j	Total intermediate consumption of activity *j* (volume)
CTH_h	Household *h*'s total consumption (value)
D_i	Demand for domestic good *i* (volume)
$DI_{i,j}$	Intermediate consumption of good *i* in activity *j* (volume)
DIT_i	Intermediate demand for good *i* (volume)
DTF	Receipts from direct taxation on firms' income
DTH_h	Receipts from direct taxation on household *h*'s income
EX_i	Exports in good *i* (volume)
G	Public expenditures
INV_i	Investment demand for good *i* (volume)
IT	Total investment
LD_j	Activity *j* demand for labor (volume)
M_i	Imports in good *i* (volume)
P_i	Producer price of good *i*
PC_i	Consumer price of composite good *i*
PD_i	Domestic price of good *i* including taxes
PE_i	Domestic price of exported good *i*
$Pindex$	GDP deflator
$Pinv$	Price index of investment
PL_i	Domestic price of good *i* (excluding taxes)
PM_i	Domestic price of imported good *i*
PV_i	Value added price for activity *j*
Q_i	Demand for composite good *i* (volume)
r_i	Rate of return to capital in activity *i*
rl	Rate of return to agricultural land
rc	Rate of return to composite factor
SF	Firms' savings
SG	Government's savings
SH_i	Household *h*'s savings

TI_i	Receipts from indirect tax on *i*
TIE_i	Receipts from tax on export *i*
TIM_i	Receipts from import duties *i*
VA_j	Value added for activity *j* (volume)
w	Wage rate
XS_i	Output of activity *i* (volume)
YDH_h	Household *h*'s disposable income
YF	Firms' income
YG	Government's income
YH_h	Household *h*'s income
LS	Total labor supply (volume)
KD_i	Demand for capital in activity *i* (volume)
CAB	Current account balance
$Ind_{i,t}$	Demand for capital in activity *i* (volume)
U_t	Capital user cost
$C_{i,h}^{min}$	Minimum consumption of good *i* by household *h*

Exogenous variables

PWE_i	World price of export *i*
PWM_i	World price of import *I*
e	Nominal Exchange rate (numéraire)

Parameters

Production functions

A_i	Scale coefficient (Cobb-Douglas production function)
$aij_{i,j}$	Input-output coefficient
α_j	Elasticity (Cobb-Douglas production function)
io_j	Technical coefficient (Leontief production function)
v_j	Technical coefficient (Leontief production function)

CES function between capital and labor

A_i^{KL}	Scale coefficient
α_i^{KL}	Share parameter
ρ_i^{KL}	Substitution parameter

$\boldsymbol{\sigma_i^{KL}}$	Substitution elasticity

CES function between skilled and unskilled labor

$\boldsymbol{A_i^{LL}}$	Scale coefficient
$\boldsymbol{\alpha_i^{LL}}$	Share parameter
$\boldsymbol{\rho_i^{LL}}$	Substitution parameter
$\boldsymbol{\sigma_i^{LL}}$	Substitution elasticity

CES function between imports and domestic production

$\boldsymbol{A_i^{M}}$	Scale coefficient
$\boldsymbol{\alpha_i^{M}}$	Share parameter
$\boldsymbol{\rho_i^{M}}$	Substitution parameter
$\boldsymbol{\sigma_i^{M}}$	Substitution elasticity

CET function between domestic production and exports

$\boldsymbol{B_i^{E}}$	Scale coefficient
$\boldsymbol{\beta_i^{E}}$	Share parameter
$\boldsymbol{\kappa_i^{E}}$	Transformation parameter
$\boldsymbol{\tau_i^{E}}$	Transformation elasticity

LES consumption function

$\boldsymbol{\gamma_{i,h}}$	Marginal share of good *i*

Tax rates

$\boldsymbol{te_i}$	Tax on exports *i*
$\boldsymbol{tm_i}$	Import duties on good *i*
$\boldsymbol{tx_i}$	Tax rate on good *i*
$\boldsymbol{tyh_h}$	Direct tax rate on household *h*'s income
$\boldsymbol{tyf}$	Direct tax rate on firms' income

Other parameters

δ_j	Share of activity *j* in total value added
λ_h^L	Share of land income received by household *h*
λ^{LF}	Share of land income received by firms
λ^{LROW}	Share of land income received by foreigners
λ_h^R	Share of capital income received by household *h*
λ^{RF}	Share of capital income received by firms
λ^{ROW}	Share of capital income received by foreigners
λ_h^W	Share of labour income received by household *h*
ψ_h	Propensity to save
μ_i	Share of the value of good *i* in total investment
ng	Population growth rate
δ	Capital depreciation rate
γ_{1i}	Parameter in the investment demand function
γ_{2i}	Parameter in the investment demand function
ir	Real interest rate

9.8 Description of ESP Simulation

Table 18: Distribution of SCG by household groups (Billion UGX)

Household Groups	ESP 1	ESP 2	ESP 3	ESP 4
	2021/22	2023/24	2026/27	2030/31
CRAg04	3.1	11.0	14.0	21.6
CRAg514	4.8	17.0	21.7	33.4
CRAg1529	6.3	22.2	28.2	43.5
CRAg3064	5.3	18.5	23.6	36.3
CRAg65+	4.8	17.0	21.6	33.3
CUAg04	0.5	1.9	2.4	3.8
CUAg514	1.5	5.4	6.9	10.6
CUAg1529	1.3	4.5	5.8	8.9
CUAg3064	1.3	4.7	6.0	9.2
CUAg65+	4.1	14.5	18.4	28.3
ERAg04	11.6	40.9	52.1	80.2
ERAg514	10.5	37.0	47.0	72.4
ERAg1529	9.1	32.0	40.7	62.7
ERAg3064	8.7	30.8	39.1	60.3
ERAg65+	4.1	14.5	18.5	28.4
EUAg04	1.3	4.7	6.0	9.3
EUAg514	1.2	4.3	5.5	8.4
EUAg1529	0.7	2.5	3.1	4.8
EUAg3064	1.2	4.3	5.5	8.5
EUAg65+	1.2	4.3	5.5	8.5
NRAg04	7.7	27.1	34.5	53.1
NRAg514	6.9	24.2	30.8	47.4
NRAg1529	5.9	20.8	26.4	40.7
NRAg3064	5.7	20.1	25.5	39.3
NRAg65+	3.4	11.9	15.1	23.3
NUAg04	0.4	1.3	1.6	2.5
NUAg514	0.6	2.2	2.9	4.4
NUAg1529	1.1	4.1	5.2	7.9
NUAg3064	0.7	2.5	3.2	4.9
NUAg65+	1.2	4.3	5.4	8.4
WRAg04	2.7	9.6	12.2	18.8
WRAg514	5.8	20.5	26.1	40.2
WRAg1529	9.0	31.6	40.2	61.9
WRAg3064	9.7	34.3	43.7	67.2
WRAg65+	11.1	39.0	49.6	76.4
WUAg04	0.6	2.2	2.8	4.3
WUAg514	1.4	5.0	6.3	9.7
WUAg1529	1.7	5.9	7.5	11.6
WUAg3064	1.2	4.3	5.4	8.4
WUAg65+	1.6	5.7	7.2	11.2
Total	161.25	568.68	723.47	1,114.00

Table 19: Distribution of Disability Benefit by household groups (Billion UGX)

Household Groups	ESP 1 2021/22	ESP 2 2023/24	ESP 3 2026/27	ESP 4 2030/31
CRAg04	0.0	0.6	5.9	8.8
CRAg514	0.0	6.8	25.9	38.3
CRAg1529	0.0	6.8	33.5	49.5
CRAg3064	0.0	5.9	33.6	49.6
CRAg65+	0.0	5.5	20.8	30.7
CUAg04	0.0	0.0	1.1	1.7
CUAg514	0.0	0.0	1.5	2.2
CUAg1529	0.0	0.0	2.5	3.7
CUAg3064	0.0	2.0	11.1	16.5
CUAg65+	0.0	8.5	35.9	53.0
ERAg04	0.0	6.4	27.8	41.2
ERAg514	0.0	11.5	46.5	68.8
ERAg1529	0.0	9.7	27.4	40.6
ERAg3064	0.0	6.0	18.3	27.1
ERAg65+	0.0	1.7	4.0	5.9
EUAg04	0.0	1.3	1.9	2.8
EUAg514	0.0	0.0	0.3	0.4
EUAg1529	0.0	0.0	0.7	1.1
EUAg3064	0.0	0.3	4.3	6.3
EUAg65+	0.0	0.3	6.3	9.3
NRAg04	0.0	15.0	50.5	74.7
NRAg514	0.0	9.1	19.6	29.0
NRAg1529	0.0	4.1	7.4	10.9
NRAg3064	0.0	3.9	7.4	10.9
NRAg65+	0.0	1.2	2.8	4.1
NUAg04	0.0	1.9	4.6	6.7
NUAg514	0.0	0.7	2.0	2.9
NUAg1529	0.0	0.4	1.5	2.2
NUAg3064	0.0	0.4	1.6	2.3
NUAg65+	0.0	1.4	4.6	6.9
WRAg04	0.0	5.1	13.4	19.9
WRAg514	0.0	17.5	52.9	78.2
WRAg1529	0.0	15.1	65.9	97.5
WRAg3064	0.0	12.5	47.6	70.4
WRAg65+	0.0	3.2	18.5	27.4
WUAg04	0.0	0.6	2.1	3.1
WUAg514	0.0	1.3	3.4	5.0
WUAg1529	0.0	3.9	12.1	17.9
WUAg3064	0.0	3.2	10.8	16.0
WUAg65+	0.0	5.5	15.2	22.6
Total	0.00	179.23	653.34	966.41

Table 20: Distribution of Child Benefit by household groups (Billion UGX)

Household Groups	ESP 1	ESP 2	ESP 3	ESP 4
	2021/22	2023/24	2026/27	2030/31
CRAg04	0.0	0.0	8.5	64.5
CRAg514	0.0	0.0	11.7	100.6
CRAg1529	0.0	0.0	17.5	134.8
CRAg3064	0.0	0.0	23.7	184.6
CRAg65+	0.0	0.0	18.8	155.2
CUAg04	0.0	0.0	2.2	16.0
CUAg514	0.0	0.0	4.0	37.5
CUAg1529	0.0	0.0	9.4	81.6
CUAg3064	0.0	0.0	17.5	143.6
CUAg65+	0.0	0.0	34.2	278.7
ERAg04	0.0	0.0	41.3	315.0
ERAg514	0.0	0.0	33.0	264.4
ERAg1529	0.0	0.0	23.0	179.6
ERAg3064	0.0	0.0	12.6	96.9
ERAg65+	0.0	0.0	4.5	36.0
EUAg04	0.0	0.0	3.4	27.8
EUAg514	0.0	0.0	3.2	28.8
EUAg1529	0.0	0.0	4.1	33.3
EUAg3064	0.0	0.0	3.4	30.8
EUAg65+	0.0	0.0	3.2	27.0
NRAg04	0.0	0.0	30.7	240.7
NRAg514	0.0	0.0	24.2	186.1
NRAg1529	0.0	0.0	19.6	153.0
NRAg3064	0.0	0.0	14.4	107.6
NRAg65+	0.0	0.0	8.0	59.7
NUAg04	0.0	0.0	2.2	16.3
NUAg514	0.0	0.0	2.2	18.0
NUAg1529	0.0	0.0	3.1	25.2
NUAg3064	0.0	0.0	3.4	31.9
NUAg65+	0.0	0.0	4.8	39.7
WRAg04	0.0	0.0	13.8	104.8
WRAg514	0.0	0.0	21.4	160.3
WRAg1529	0.0	0.0	25.7	203.7
WRAg3064	0.0	0.0	27.4	229.4
WRAg65+	0.0	0.0	18.7	170.6
WUAg04	0.0	0.0	1.0	9.6
WUAg514	0.0	0.0	3.3	27.4
WUAg1529	0.0	0.0	4.4	32.7
WUAg3064	0.0	0.0	7.6	59.4
WUAg65+	0.0	0.0	9.3	72.6
Total	**0.00**	**0.00**	**524.56**	**4,185.40**

9.9 Impacts on Household Consumption (Million UGX)

	Central Rural		Central Urban		Eastern Rural		Eastern Urban	
	BAU	ESP	BAU	ESP	BAU	ESP	BAU	ESP
2022	15,513,667	15,549,582	26,436,525	26,454,999	11,623,696	11,679,394	3,790,904	3,798,296
2023	16,468,941	16,521,203	28,076,615	28,102,269	12,337,030	12,419,432	4,024,775	4,035,558
2024	17,477,301	17,602,836	29,806,960	29,872,304	13,089,878	13,276,099	4,271,623	4,294,314
2025	18,551,137	18,698,160	31,647,986	31,721,164	13,891,632	14,112,587	4,534,312	4,560,855
2026	19,687,694	19,874,874	33,595,483	33,685,382	14,740,115	15,024,651	4,812,281	4,846,034
2027	20,931,122	21,261,403	35,719,893	35,909,048	15,669,497	16,095,379	5,115,860	5,172,040
2028	22,249,815	22,638,735	37,973,863	38,189,388	16,655,026	17,161,083	5,437,954	5,503,859
2029	23,671,216	24,212,897	40,400,521	40,698,311	17,717,857	18,424,469	5,784,921	5,876,585
2030	25,201,950	26,020,228	43,011,938	43,466,837	18,862,991	19,927,088	6,158,481	6,297,103
2031	26,829,922	27,863,091	45,790,453	46,488,721	20,080,781	21,418,770	6,555,925	6,752,071

	Northern Rural		Northern Urban		Western Rural		Western Urban	
	BAU	ESP	BAU	ESP	BAU	ESP	BAU	ESP
2022	10,658,832	10,696,378	4,476,866	4,482,990	19,066,469	19,119,285	8,277,966	8,289,125
2023	11,314,541	11,369,665	4,753,175	4,761,928	20,243,578	20,320,375	8,790,901	8,806,651
2024	12,005,900	12,139,099	5,044,620	5,066,234	21,484,595	21,679,106	9,331,532	9,375,854
2025	12,742,629	12,900,227	5,354,922	5,380,057	22,807,538	23,036,856	9,907,700	9,959,342
2026	13,521,973	13,724,121	5,683,184	5,714,842	24,207,083	24,499,553	10,517,084	10,581,917
2027	14,375,256	14,681,666	6,041,943	6,094,319	25,738,155	26,217,868	11,182,726	11,292,962
2028	15,279,981	15,643,067	6,422,456	6,483,525	27,361,374	27,928,150	11,888,573	12,017,244
2029	16,255,523	16,761,715	6,832,470	6,917,091	29,111,016	29,899,625	12,648,949	12,826,889
2030	17,306,224	18,069,595	7,273,916	7,402,296	30,994,458	32,184,938	13,467,113	13,737,018
2031	18,423,744	19,444,958	7,743,535	7,924,975	32,997,659	34,425,049	14,337,515	14,676,105