

The social and economic impact of investment and social protection in Senegal

An integrated assessment using the Structural Model for Sustainable Development



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► Abbreviations

CEC	<i>Carte d'Égalité des Chances</i> [Equal Opportunities Card]
GDP	gross domestic product
ILO	International Labour Organization
NEET	not in employment, education or training
SMSD	Structural Model for Sustainable Development
VAT	value added tax
VTP	vocational training phase
XOF	West African CFA franc
PNBSF	Programme National de Bourses de Sécurité Familiale

► Acknowledgements

This report contributes to the work of the Global Accelerator on Jobs and Social Protection for Just Transitions, an initiative led by the United Nations Secretary-General to address global deficits in decent work and social protection. The analysis presented here aligns with Senegal's commitment to advancing social justice and inclusive development through integrated policy interventions.

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1. Introduction

Under the United Nations Secretary-General's Global Accelerator on Jobs and Social Protection for Just Transitions initiative, Senegal, as a pathfinder country, has embarked on an ambitious journey to advance social justice, promote decent work and extend social protection through integrated policy interventions. The Global Accelerator represents a comprehensive framework aimed at closing decent jobs deficits (there is a shortage of 400 million jobs worldwide) and extending social protection (3.8 billion people remain excluded from social protection). In this context, Senegal's commitment to aligning its national development strategies with these global objectives necessitates a rigorous assessment of the social and economic impact of its policy interventions.

This report presents an integrated assessment of investment operations and social protection policies in Senegal using the Structural Model for Sustainable Development (SMSD). The SMSD, developed by the International Labour Organization (ILO), serves as a versatile quantitative tool that enables policymakers to evaluate the complex interactions between the economic, social and environmental dimensions of development. Unlike many existing policy tools that often analyse policies in isolation, the SMSD captures the interconnected nature of economies, providing insights into how interventions in one sector ripple through the entire socio-economic system.

The assessment focuses on two critical policy areas identified in Senegal's development agenda and reflected in its national Global Accelerator road map. Firstly, it examines the impact on employment and households of investments planned under the National Development Plan (2025–29), particularly the strategic allocation of resources to the agriculture, livestock, fishing and transport infrastructure sectors. Secondly, it evaluates a comprehensive set of social protection programmes ranging from existing cash transfers to more innovative interventions such as social health protection contribution subsidies and vocational training for young people. Importantly, the analysis also explores various financing mechanisms for these programmes, recognizing that sustainable and feasible funding is crucial for long-term policy success.

Chapter 2 of the report introduces the SMSD methodology, explaining its dual-module framework that combines macroeconomic modelling with microsimulation techniques. Chapter 3 presents the impact of Senegal's investment plans on employment and households, demonstrating how infrastructure development can generate both temporary and permanent employment while affecting income distribution. Chapter 4 provides a detailed assessment of five social protection scenarios, analysing their effectiveness in poverty reduction and their differential impact across household types. Chapter 5 concludes with policy recommendations that emerge from the integrated analysis.

2. Methodology: The Structural Model for Sustainable Development

The SMSD is a comprehensive analytical framework developed by the ILO to assess the multidimensional impact of policy interventions in developing economies. Grounded in structuralist macroeconomic theory, the SMSD captures the complex interactions between economic sectors, social groups and institutional arrangements that characterize developing economies. This approach recognizes that economic outcomes are fundamentally shaped by existing structures and institutional relationships, making it particularly suitable for analysing policy impact in contexts where market imperfections, structural constraints and social inequalities are prevalent.

At its core, the SMSD consists of two interconnected modules that can operate independently or in tandem, depending on the nature of the policy analysis required. The macroeconomic module is built upon the Social Accounting Matrix, a comprehensive representation of economic transactions between different sectors, institutions and social groups within an economy. For Senegal, this module incorporates 27 products and industries, capturing detailed sectoral linkages and allowing for nuanced analysis of how policies propagate through the economy. The model distinguishes between demand-driven sectors and capacity-constrained sectors (such as agriculture, transport and utilities) where production expansion requires specific investment. This differentiation is crucial for understanding both short-term adjustment mechanisms and long-term structural changes resulting from policy interventions.

The microsimulation module addresses the limitations of aggregate economic analysis by working with individual and household-level data from labour force and household surveys. This module employs state-of-the-art machine learning techniques, specifically a feedforward neural network with multiple hidden layers, to model complex relationships between individual characteristics and socio-economic outcomes. The neural network approach permits the identification of non-linear patterns in large datasets, providing more realistic representations of how policies affect different population groups based on their specific characteristics, such as education, age, occupation, location and vulnerability status.

The integration of these modules creates a useful analytical framework with flexible implementation pathways. The top-down approach begins with macroeconomic simulations of policy shocks, the results of which are then fed into the microsimulation module to analyse distributional impact at the household level. This approach is particularly suitable for assessing large-scale investments or economy-wide policies. Conversely, the bottom-up approach starts with household-level interventions simulated in the microsimulation module, with aggregated results then incorporated into the macroeconomic model to assess economy-wide effects.

For the Senegal assessment, the SMSD utilizes a rich dataset including time series of Social Accounting Matrices produced by the National Agency of Statistics and Demography, the 2019 National Employment Survey and the 2022 Harmonized Household Living Conditions Survey. The implementation process involves iterative stakeholder consultations to ensure that policy scenarios accurately reflect national priorities and that model assumptions align with country-level economic and policy realities. This participatory approach enhances the relevance and credibility of the analysis while facilitating the building of local capacity for evidence-based policymaking.

Another methodological strength of the SMSD lies in its ability to bridge the gap between macroeconomic policy analysis and microeconomic impact assessment. By combining structural economic modelling with advanced microsimulation techniques, it provides policymakers and development partners with detailed insights into how interventions affect different economic sectors, employment categories and household types. This comprehensive approach is essential for designing policies and investments that promote both economic growth and social inclusion, making the framework valuable for countries, like Senegal, that are pursuing transformative development agendas within the Global Accelerator framework.

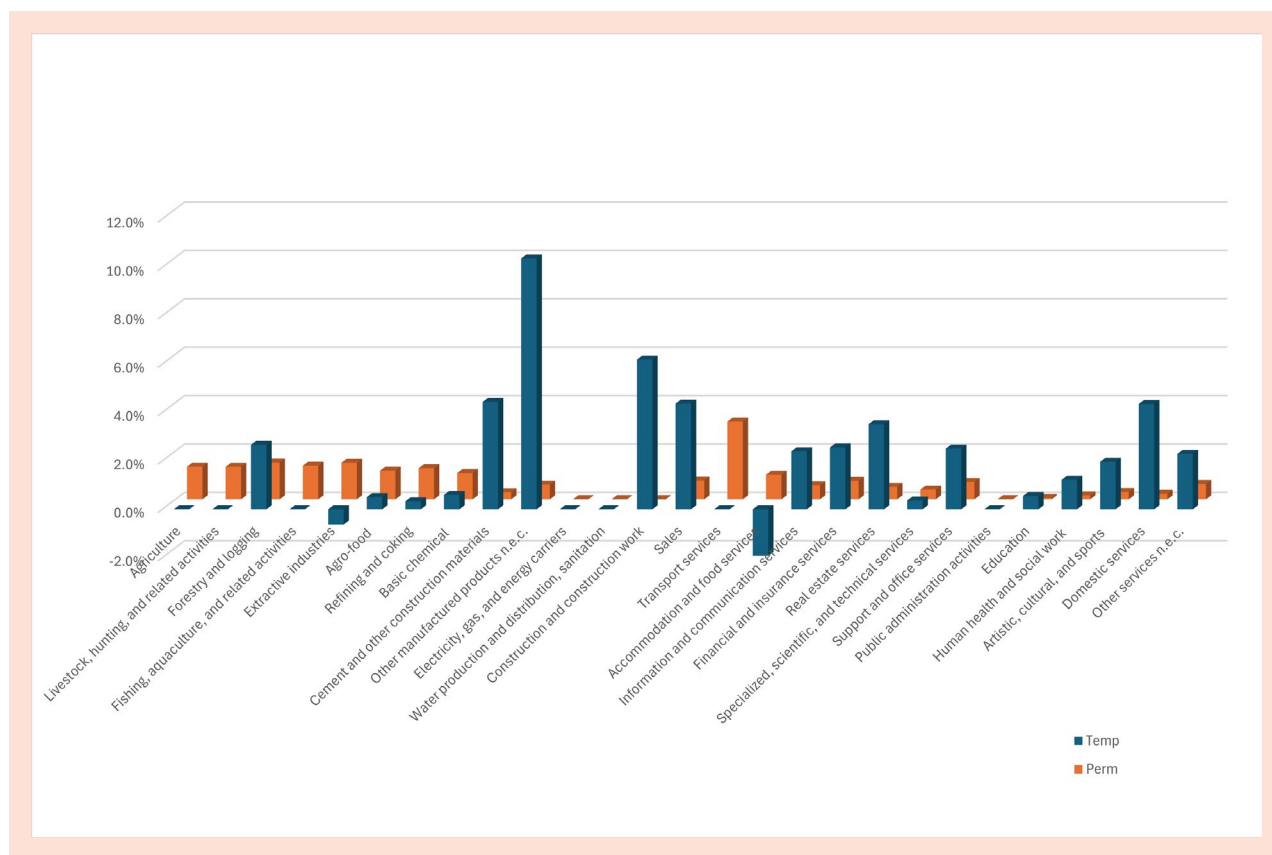
3. The impact of investment plans on employment and households

In its recent National Development Plan (2025–29), Senegal outlined a strategic allocation of 12,821 billion West African CFA francs (XOF) over the next five years to support key sectors critical to the nation's economic growth and development. Of this allocation, 10.5 per cent will be directed towards the agriculture, livestock and fishing sectors, while 11.2 per cent will fund improvements in transport infrastructure. The remainder will fund various other programmes. This study focuses specifically on these two investment operations. For the agriculture, livestock and fishing sectors, the primary focus is on mechanizing production processes to enhance productivity and efficiency. Transport infrastructure investments, meanwhile, will prioritize both the rehabilitation of existing roadways and the development of a new road and sea transport line, addressing pressing needs in connectivity and accessibility (DGPPE 2022).

Adopting a top-down approach, investment shocks are implemented in the SMSD model, which is calibrated based on the Social Accounting Matrix produce by ANSD in 2022. These shocks, which focus on forming capital in the aforementioned sectors, that is, the agriculture, livestock, fishing and transport sectors, generate two types of effect: temporary and permanent. A temporary employment impact is defined as an employment effect generated by activities directly associated with a project itself (such as the building of productive capacity in the aforementioned sectors). These jobs exist only for the duration of the investment operation. Permanent employment is an employment effect generated by a project's longer-lasting outcomes. In this context, the project's anticipated outcomes are higher productive capacity for the agriculture, livestock, fishing and transport sectors. In economic terminology, this pushes the economy towards greater long-term equilibrium.³ Detailed discussion of the distinction between temporary and permanent employment effects can be found in Jiang and La Marca (2023). The SMSD model estimates that the investment operations in the National Development Plan will generate 145,453 temporary jobs and 51,067 permanent jobs across the economy. A large proportion – that is, 61.2 per cent of temporary jobs and 70.7 per cent of permanent jobs – will, however, be self-employment, which tends to be associated with informality.

³ Permanent effects should not be confused with permanent jobs, which refer to conditions of employment and the contract types under which individuals are employed. Thus, a permanent effect can be filled by a worker on a permanent contract, but also through a series of temporary contracts should the employer so choose.

► **Figure 3.1. Temporary and permanent employment impact, by sector (percentage)**

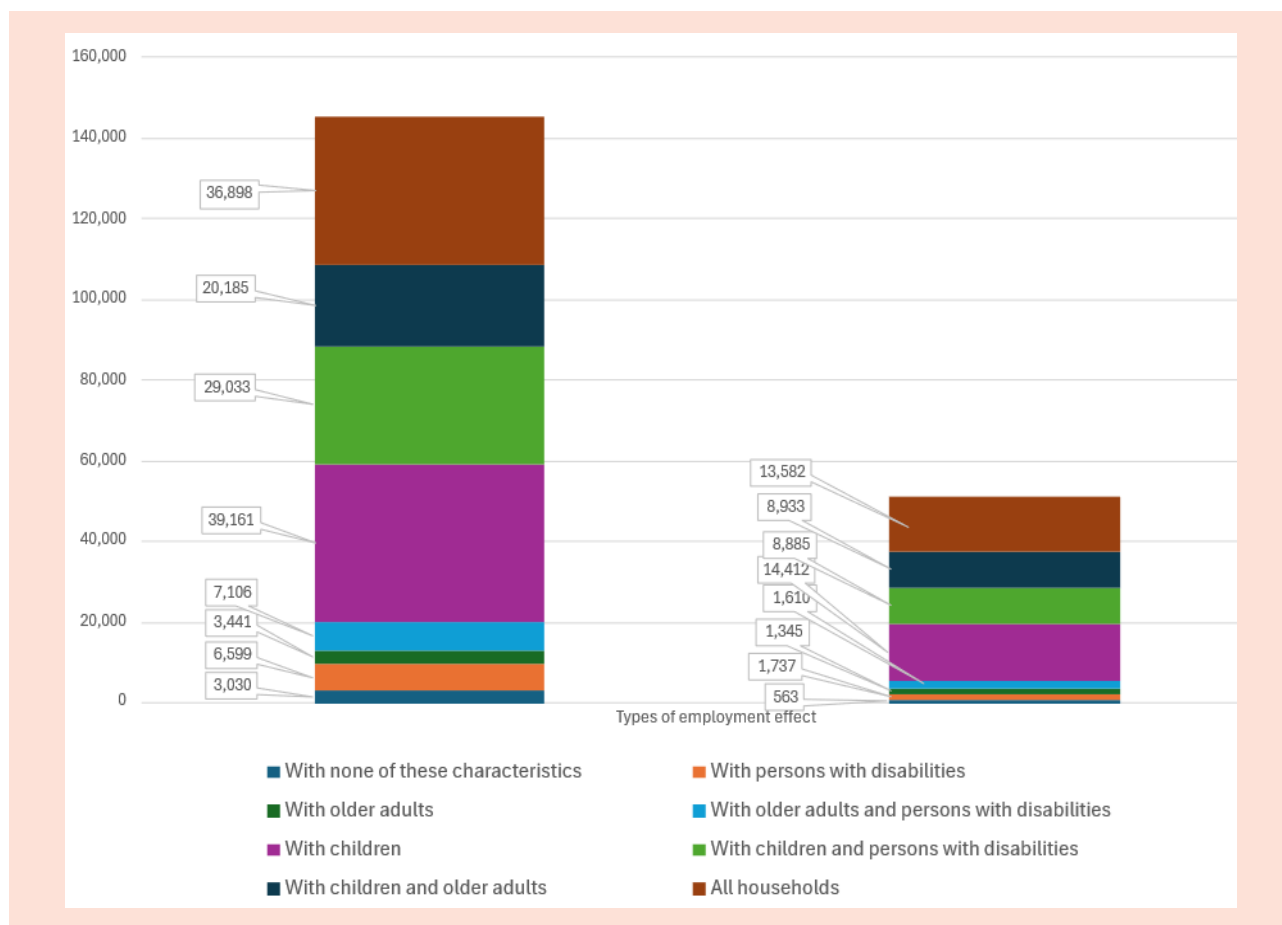


Source: ILO calculations.

Figure 3.1. above shows the temporary and permanent employment impact (in percentage terms) of these investment operations. The construction materials, other manufactured products and construction services sectors receive the shock of temporary impact directly and hence demonstrate strong employment impact. Moreover, noticeable effects can also be found on other sectors such as sales, real estate and domestic services; these are the economy-wide effects. Permanent effects have considerable impact on the four targeted sectors due to the increase in productive capacity, as well as economy-wide impact in most other sectors.

These results are subsequently used as inputs for the feedforward neural network in the microsimulation module. The process involves first estimating each household member's propensity score to find a job in a particular sector with their given characteristics (as inputs for the network), then matching sector-specific job openings with household members without jobs, based on the ranking of their propensity scores. Figure 3.2. below indicates how the temporary and permanent employment effects are distributed across different household categories.

► **Figure 3.2. Temporary and permanent employment impact by household type**

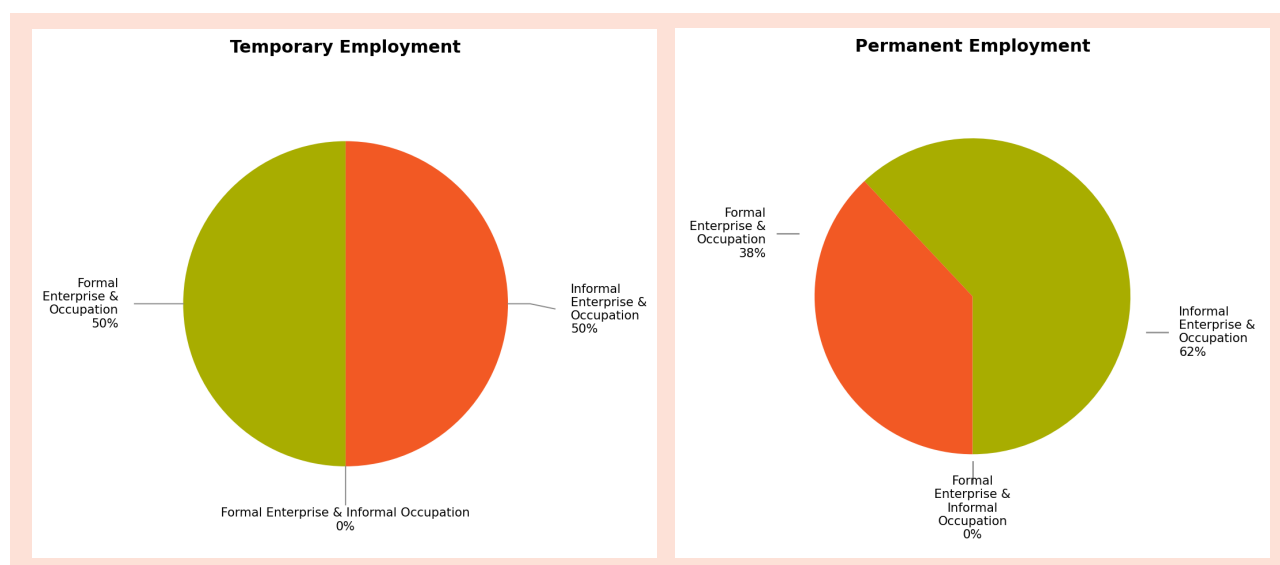


Source: Author's calculations using the ILO Harmonized Microdata collection.

Figure 3.2. shows that the majority of newly created jobs would go to households with at least one child (aged under 18) or households with at least one child and one older adult (aged 65 or above). Households with none of the characteristics and households with at least one older adult enjoy the smallest shares, as demonstrated by the relative sizes of the respective sections of the bar on the graph. These results are unsurprising since the baseline labour force size is larger for household types that receive larger shares of the newly created jobs. In other words, the results are, to some extent, proportional to the baseline distribution of employment across different household types, which is realistic. The varied employment effects across different household categories remain, however, of great interest for employment impact assessment and policy relevance.

The 2022 Harmonized Household Living Conditions Survey contains detailed information on two categories of informality: enterprise and occupational. Each job can therefore be classified into one of four categories: formal enterprise and formal occupation, informal enterprise and formal occupation, formal enterprise and informal occupation, and informal enterprise and informal occupation. The feedforward neural network is first trained on the characteristics of workers' households as well as the sector to which their jobs belong, and it is then used to calculate the propensity scores for those newly generated jobs, whether formal or informal. Figure 3.3. below indicates the share of employment generated for each category.

► **Figure 3.3. Percent share of employment generated, by formality status**



Source: Author's calculations using the ILO Harmonized Microdata collection.

It is clear from figure 3.3. that the employment generated is in either the informal enterprise and informal occupation category or the formal enterprise and formal occupation category. There is a low level of employment generation in the formal enterprise and informal occupation category (around 0.9 per cent), while the informal enterprise and formal occupation category does not exist in the data. It is evident that of the total employment generated, 50.4 per cent falls within the informal enterprise and informal occupation category for temporary impact, and 62.1 per cent for permanent impact. These results are, however, rather encouraging, particularly when compared with the baseline informality rate from the Harmonized Household Living Conditions Survey, which is 93.1 per cent for informal enterprise and informal occupation, 2 per cent for formal enterprise and informal occupation, and 4.9 per cent for formal enterprise and formal occupation. This implies that the employment generated across the economy by the investment operations tends to comprise a higher proportion of formal jobs and a lower proportion of informal jobs when compared with the baseline national average.

The microsimulation can also tap into the changes in household income resulting from the macroeconomic shock. Table 3.1. below is a heatmap table that demonstrates the estimated real income increases experienced by households with various characteristics.

► **Table 3.1. Temporary and permanent real income impact on households (percentages)**

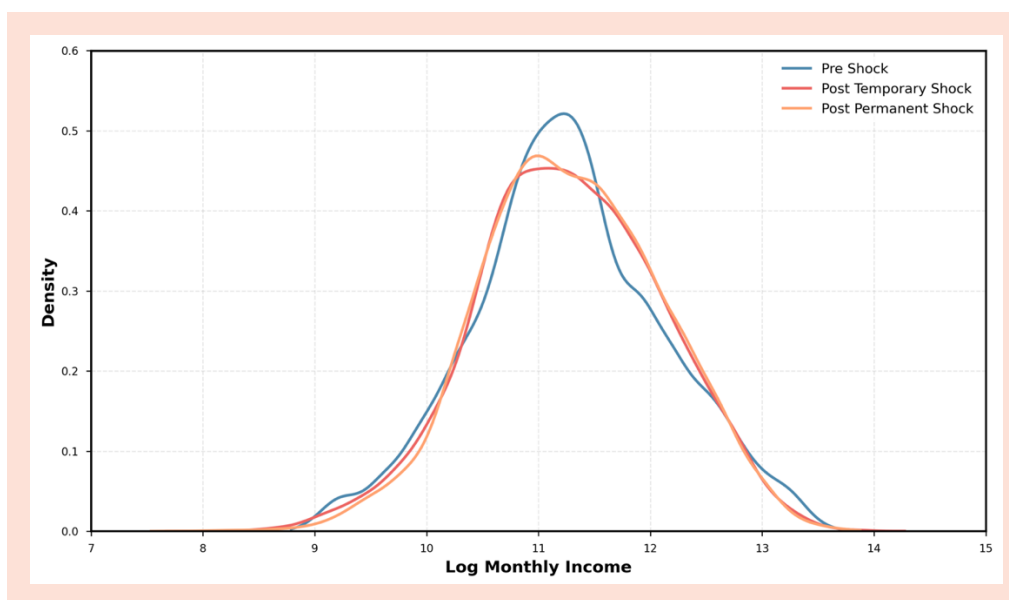
	Temporary	Permanent
Households without children, persons with disabilities or older adults	2.84	0.72
Households with persons with disabilities	8.37	1.22
Households with older adults	1.63	0.42
Households with older adults and persons with disabilities	6.40	0.88
Households with children	2.79	0.70
Households with children and persons with disabilities	4.01	0.97
Households with children and older adults	3.03	0.86
All	2.88	0.70

Source: ILO calculations

It is evident from Table 3.1. that households with persons with disabilities experience the most substantial real income increases relative to the baseline, with an 8.37 per cent temporary gain and a 1.22 per cent permanent gain. Households with older adults and persons with disabilities (6.40 per cent temporary gain and 0.88 per cent permanent gain) and households with children and persons with disabilities (4.01 per cent temporary gain and 0.97 per cent permanent gain) also show notably higher percentage increases. While temporary effects are significantly larger across all household types, permanent real income effects appear more evenly distributed when measured as percentage changes. These microsimulation results are particularly encouraging for households with persons with disabilities, which experience relatively higher income gains. This can be attributed to their having more underutilized labour potential at baseline; when domestic demand increases, they can mobilize relatively more labour resources in response.

Lastly, the microsimulation also allows for an estimation of the changes in real income distribution caused by the interventions.

► **Figure 3.4. Distribution of income before and after the interventions**



Source: Author's calculations using the ILO Harmonized Microdata collection.

Figure 3.4. displays the distribution of log monthly income, with the baseline (pre-shock) distribution revealing a relatively concentrated pattern with a pronounced peak around a log monthly income of 11. This sharp peak indicates a substantial clustering of households within a narrow middle-income range, while fewer households occupy the lower and higher ends of the income spectrum. This pre-intervention distribution exhibits a classic bell-shaped curve, but with a particularly concentrated central mass.

Both temporary and permanent economic interventions alter this distribution in similar ways, creating flatter, more dispersed income distributions with lower peak densities than the baseline. The post-intervention curves show relatively higher densities in the upper-middle income ranges (log monthly income 11.5–13) and slightly lower densities at the central peak. This indicates a redistribution of households across different income levels rather than a simple uniform shift of the entire distribution.

In summary, Senegal's planned investments in agriculture and transport infrastructure demonstrate significant potential for employment generation and poverty and inequality reduction. The projected creation of 145,453 temporary and 51,067 permanent jobs will provide economic opportunities across various sectors, although the persistence of informality remains a challenge. The analysis reveals that these investments produce

more equitable income distribution, with households with persons with disabilities experiencing particularly strong income gains due to their previously underutilized labour potential. The shift towards a flatter income distribution curve following both temporary and permanent interventions suggests that strategic public investments can simultaneously promote economic growth and reduce inequality. These findings underscore the importance of well-designed agriculture and infrastructure investments as catalysts for inclusive development in Senegal.

4. Assessment of social protection programmes

4.1. Overview of social protection scenarios

The analysis evaluates five social protection scenarios, building from existing programmes to more comprehensive interventions:

Existing transfer (scenario 0): the baseline scenario, representing the current cash transfer programme known as the *Programme National de Bourses de Sécurité Familiale* [National Family Security Allowances Programme] (PNBSF), also referred to as *bourses familiales* [family allowances], which provides 25,000 XOF per quarter per household to the poorest 316,940 households, at a cost of 31.69 billion XOF annually. Launched in 2013, the PNBSF's main objective is to reduce extreme poverty and vulnerability by providing quarterly cash transfers to the poorest households, identified through a national registry. The transfers are designed to help families meet basic needs, support children's education and health (with requirements including school attendance and up-to-date vaccination) and, ultimately, improve social inclusion and resilience. While the programme was initially designed to support beneficiary households for five years, the Government continues to maintain it. The programme is considered Senegal's flagship social assistance initiative. The distribution of these transfers is currently suspended pending the completion of a recertification process, with the foremost priority being to ensure an effective resumption of payments once that process is finalized.

Top-up transfer (scenario 1): an enhancement of the existing programme through an additional 10,000 XOF per quarter per household for the same beneficiaries, adding 12.78 billion XOF to the annual cost. This increase in the amount granted via the PNBSF was approved in 2023 by the previous Government, although it has not yet been implemented due to the change in administration and the subsequent initiation of the recertification process. This evaluation seems particularly relevant to supporting that recertification process, reinstating the allowances and addressing the financing mechanism.

Extreme poverty elimination (cash bridge) (scenario 2): a more targeted approach providing the amount necessary to lift households out of extreme poverty, at an additional cost of 55 billion XOF annually. Like scenario 1, scenario 2 represents an increase in the amount transferred under the PNBSF, which is a recurrent topic of public debate and for which precise impact projections are therefore of particular interest.

Comprehensive care (scenario 3): a specialized programme providing social health protection contribution subsidies amounting to 7,000 XOF per year to 75,000 individuals with disabilities ⁴ at an additional cost of 341.73 million XOF annually. This measure relates directly to the expansion of benefits under the *Carte d'Égalité des Chances* [Equal Opportunities Card] (CEC) programme, which is a recognized policy objective referenced in both Senegal's National Development Strategy and its Global Accelerator reform strategy. The CEC is Senegal's flagship social protection programme for persons with disabilities, providing subsidized access to basic social services such as healthcare, education, vocational training, transport and certain forms of income support, with the goal of reducing inequalities and promoting the social inclusion of CEC holders.

Public work and training (scenario 4): a two-component programme offering 45 days' employment with a daily wage of 2,225 XOF to beneficiaries of scenarios 0 and 1, as well as vocational training and a monthly stipend of 20,000 XOF for households with young persons not in employment, education, or training (NEET), at an additional cost annually of 69.77 billion XOF and 2.41 billion XOF, respectively. This measure entails the introduction of a labour-intensive public works approach in technical and vocational education and training policies and social policies, aligned with the priorities of Senegal's Global Accelerator road map.

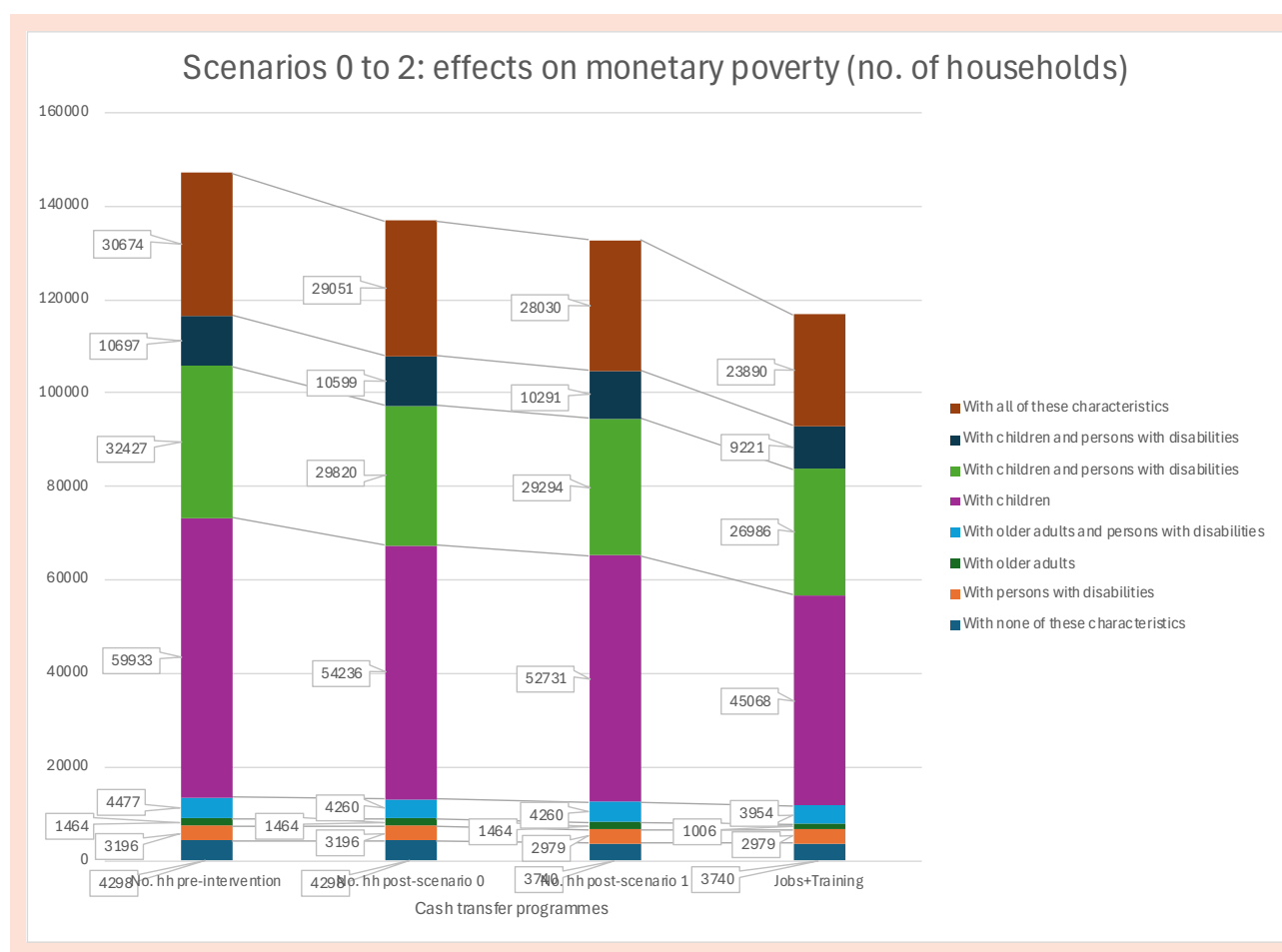
These scenarios represent a range of approaches to social protection, from simple cash transfers to more complex interventions combining income support with capacity-building.

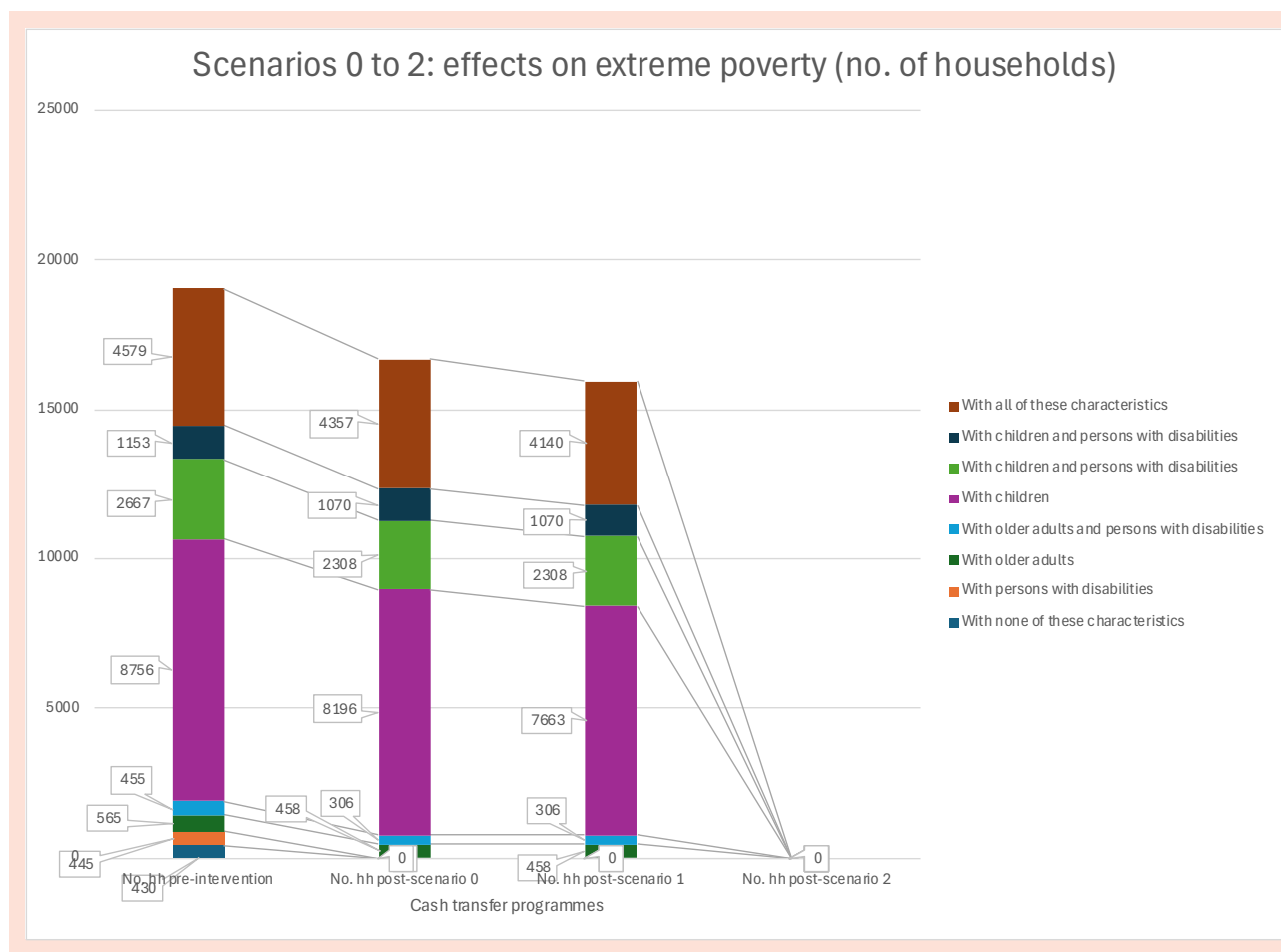
⁴ These individuals may be in the informal or formal economy.

4.2. Scenarios 0 to 2: Poverty impact and programme effectiveness

A bottom-up approach was taken to evaluate the impact of these scenarios on households and the macroeconomy. Figure 4.1. below illustrates the situation prior to the interventions and the effects of scenarios 0 to 2 on monetary poverty (left) and extreme poverty (right) at the household level, based on microsimulation.

► **Figure 4.1. Policy effects on poverty**





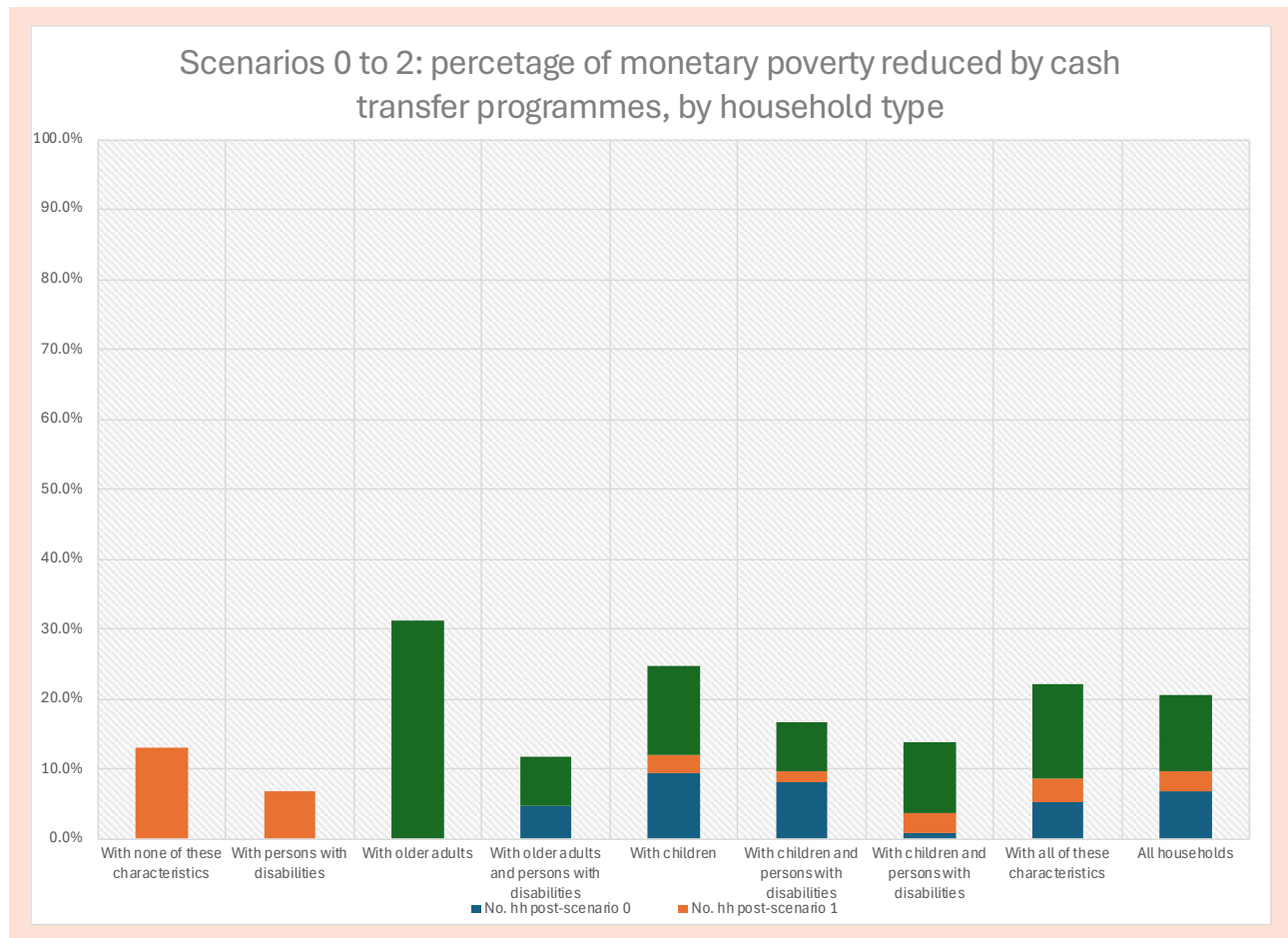
Source: Author's calculations using the ILO Harmonized Microdata collection.

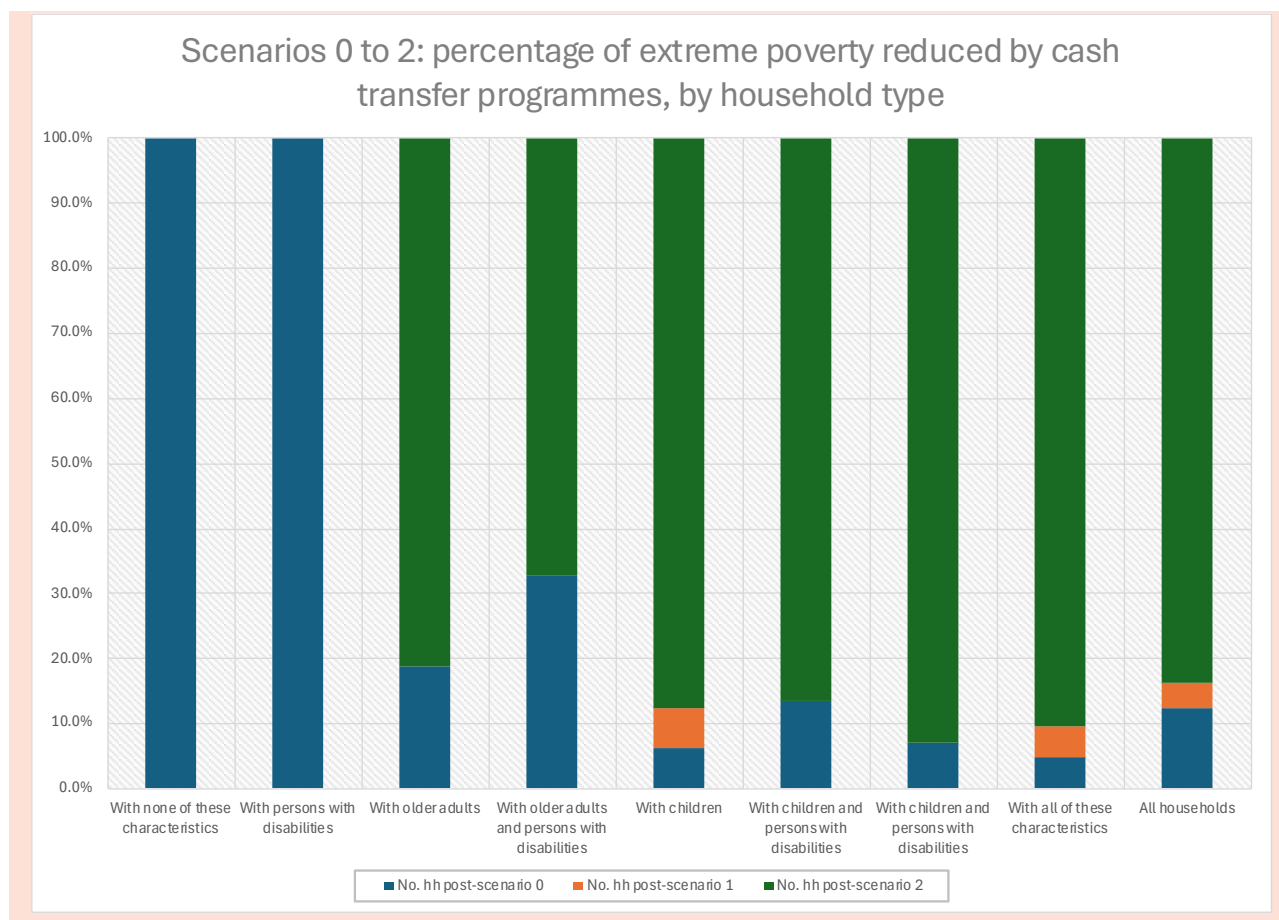
In figure 4.1. above, each bar indicates a scenario, from the pre-intervention baseline to scenario 2. The height of each bar shows the number of households in either monetary poverty (left) or extreme poverty (right). As before, each bar is partitioned into coloured segments, representing household types as shown in the legend on the right-hand side of each graph. In scenarios 0 to 2, both monetary and extreme poverty decline after each intervention. As expected in the policy design, scenario 2 would fully eliminate extreme poverty, while monetary poverty is reduced only moderately.

The progressive poverty reduction seen across the scenarios demonstrates the incremental benefits of enhanced social protection. The existing transfer (scenario 0) lays a foundation by reaching 316,940 households with quarterly transfers of 25,000 XOF, resulting in initial poverty reduction. The top-up transfer (scenario 1) builds on that foundation with an additional 10,000 XOF per quarter, further reducing both monetary and extreme poverty levels. The extreme poverty elimination (cash bridge) programme (scenario 2) represents the most ambitious intervention, providing transfers calibrated to lift households completely out of extreme poverty and achieving its design objective of eliminating extreme poverty entirely.

The model can also be used to assess the effectiveness of each policy programme or scenario for each household type in terms of poverty elimination.

► **Figure 4.2. Policy effectiveness on monetary and extreme poverty reduction by household type**





Source: Author's calculations using the ILO Harmonized Microdata collection.

In figure 4.2. above, the bars represent the effect on each household type, while their height indicates the percentage of poverty reduced by the policies, with the coloured segments representing different policy scenarios. The left-hand panel shows that, collectively, scenarios 0 to 2 reduce monetary poverty by approximately 20 per cent across all household types. However, significant variations in effectiveness exist across different household categories. Households with only older adults experience the highest monetary poverty reduction at over 30 per cent, while the reduction experienced by households with children is just over 25 per cent.

A notable finding is the differential impact of individual scenarios across household types. For households with none of the mentioned characteristics and households with only persons with disabilities, monetary poverty reduction is achieved entirely through scenario 1 (top-up transfer). For households with only older adults, monetary poverty reduction comes exclusively from scenario 2 (cash bridge). In contrast, other household types benefit from the combined effects of multiple scenarios.

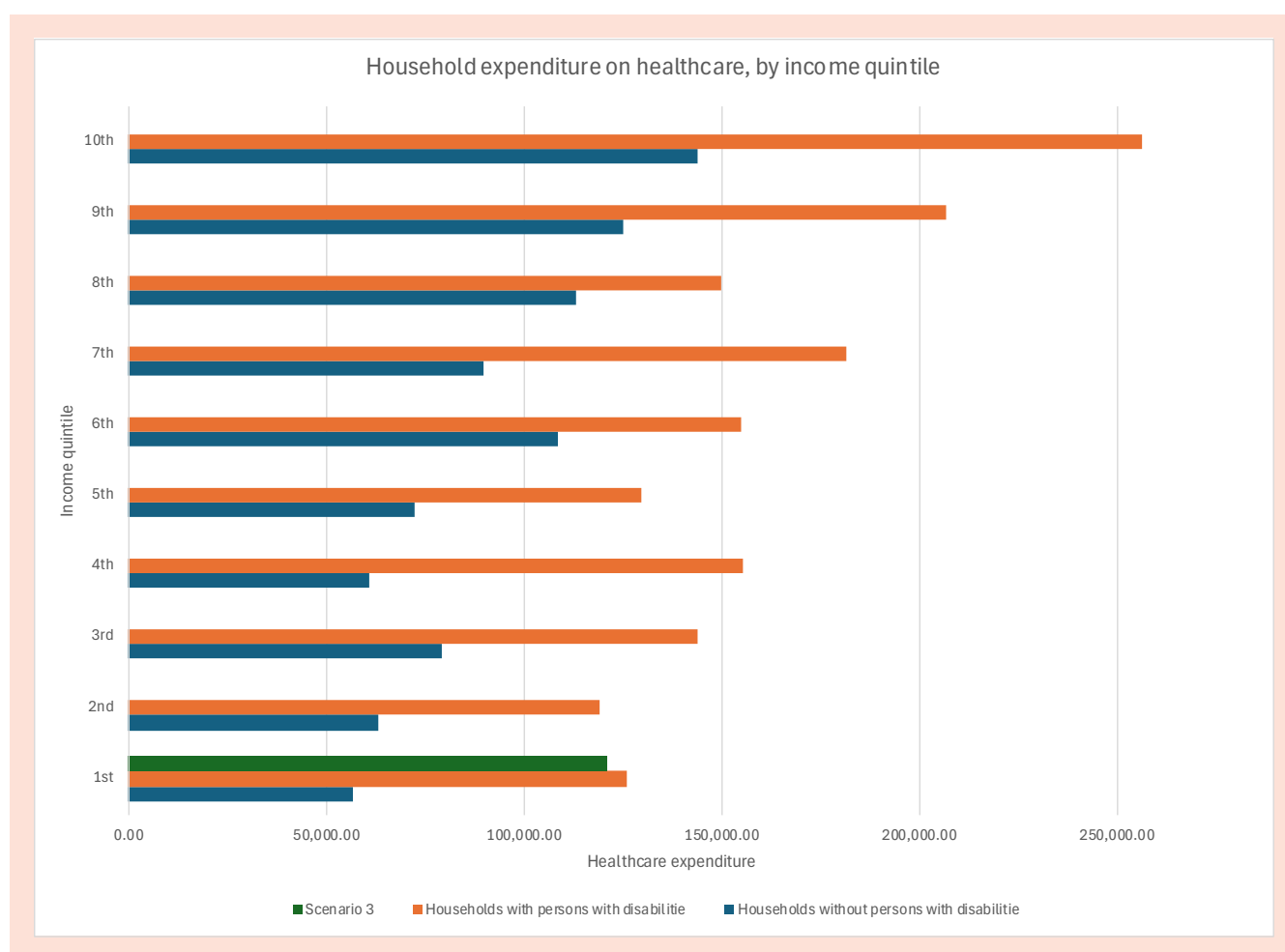
The right panel demonstrates the complete elimination of extreme poverty across all household types. Significantly, the existing transfer programme (scenario 0) already achieves full extreme poverty elimination for households with none of the mentioned characteristics and households with only persons with disabilities. This suggests that the current programme design is particularly effective for these groups. For the remaining household types, scenario 2 (cash bridge) plays a crucial role in fully eliminating extreme poverty. Notably, scenario 1 (top-up transfer) shows limited additional impact on extreme poverty reduction.

4.3. Scenario 3: Comprehensive care for persons with disabilities

Scenario 3, the CEC programme, is specifically designed to address the needs of persons with disabilities through subsidies covering 100 per cent of annual social health protection contributions. The programme provides 7,000 XOF per year to 75,000 persons with disabilities, representing a targeted intervention with an additional cost of 341.73 million XOF. While this amount is relatively modest compared to other social protection programmes, its targeted nature allows for focused support for a particularly vulnerable group.

The microsimulation analysis examines the impact of this programme on healthcare expenditure patterns across income quintiles, recognizing that disability often imposes additional financial burdens on households through increased healthcare costs. Figure 4.3. below illustrates average annual household expenditure on healthcare in XOF and the effects of the CEC programme.

► **Figure 4.3. Average annual household expenditure on healthcare, by income quintile, in XOF**



Source: Author's calculations using the ILO Harmonized Microdata collection.

In figure 4.3., the vertical axis displays households categorized by income quintiles, while the horizontal axis represents the average annual healthcare expenditure (in XOF) for each household category. The orange bars indicate healthcare spending by households with members with disabilities, the blue bars represent households without members with disabilities and the green bar at the bottom shows the adjusted expenditure for the poorest households with members with disabilities following the implementation of the CEC programme.

The results reveal two critical findings. Firstly, households with members with disabilities consistently spend significantly more on healthcare compared to households without members with disabilities across all income

quintiles. This disparity is most pronounced among the poorest households, where the healthcare expenditure burden represents a substantially larger proportion of household resources. The gap in healthcare spending between households with and without members with disabilities narrows, in most cases, as income increases, suggesting that wealthier households are better able to absorb disability-related healthcare costs.

Secondly, the CEC programme demonstrates measurable impact in reducing the healthcare expenditure burden for low-income households with members with disabilities. The green bar shows that the 7,000 XOF annual subsidy provides meaningful relief to the poorest households, although the analysis suggests that the current subsidy level addresses only a portion of the additional healthcare costs associated with disability.

The findings indicate that while the CEC programme represents an important step towards addressing disability-related healthcare costs, there is scope for enhancement. The current subsidy level of 7,000 XOF per year appears quite insufficient to fully offset the additional healthcare burden faced by households with members with disabilities, particularly among the poorest segments of the population. Scaling up the subsidy and potentially introducing a progressive structure that provides greater support to lower-income households could enhance the programme's effectiveness in achieving healthcare equity.

Overall, this analysis underscores the value of targeted healthcare subsidies in addressing specific vulnerabilities. The CEC programme contributes to both improved access to healthcare for persons with disabilities and reduced economic hardship for their households. Its implementation alongside other social protection measures demonstrates Senegal's commitment to inclusive social policy, although the results suggest opportunities for programme refinement and expansion to achieve greater impact.

4.4. Scenario 4: Vocational training and employability enhancement

Scenario 4 represents an integrated approach to social protection that combines immediate income support with long-term capacity-building. This two-component programme addresses both short-term poverty alleviation and structural barriers to employment, with a total additional cost of 72.18 billion XOF (69.77 billion for public works and 2.41 billion for vocational training).

The first component offers 45 days' employment with a daily wage of 2,225 XOF to beneficiaries of scenarios 0 and 1, effectively functioning as a public works programme. This intervention was modelled as cash transfers at the household level, generating similar poverty reduction effects to those discussed in section 4.2. The full results, which are detailed in the appendix, demonstrate that this component reduces monetary poverty by 15.7 per cent and extreme poverty by 35.2 per cent relative to scenario 1. While more effective than scenario 2 in reducing monetary poverty (15.7 per cent versus 12 per cent), it does not achieve the complete elimination of extreme poverty seen in scenario 2, since extreme poverty is no longer the target of this policy intervention.

The second component focuses on vocational training for construction sector employability, targeting households with young NEETs. This programme adopts a two-phase approach designed to transition participants from training to productive employment:

- **Short-term phase** (the first six months): trainees receive vocational training with a 20,000 XOF monthly stipend during which they cannot engage in full-time employment. This phase focuses on skill acquisition and certification.
- **Long-term phase** (after six months): trainees transition to the labour market with enhanced employability, able to work full-time while applying their newly acquired skills.

The microsimulation model employs machine learning techniques to predict employment probabilities in the construction sector based on changes in key individual characteristics. The model considers three primary factors: current educational attendance status, vocational training history and years of education completed. These characteristics interact to determine an individual's likelihood of securing employment in the construction sector.

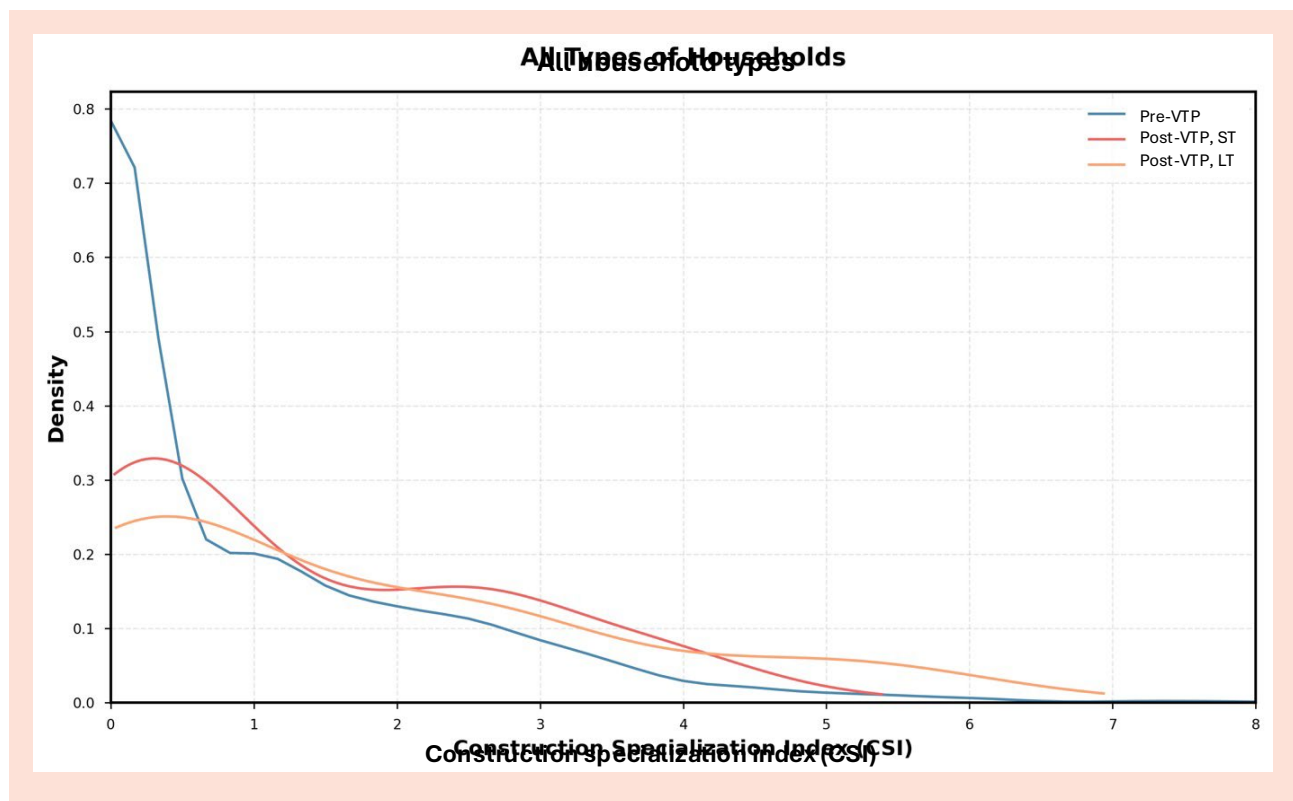
The results indicate substantial improvements in construction sector employability:

- Baseline employability index: 1.046
- Short-term employability index: 1.329 (27 per cent increase)

- Long-term employability index: 1.674 (60 per cent increase)

Figure 4.4. illustrates the density distribution of the construction sector employability index across all individuals, demonstrating the programme's impact on employment prospects.

► **Figure 4.4. Density distribution of the construction sector employability index**



Source: Author's calculations using the ILO Harmonized Microdata collection.

In figure 4.4., the blue curve represents the baseline density distribution of construction sector employability for all individuals. The red curve indicates the distribution after the short-term vocational training phase (VTP), while the orange curve shows the distribution following the long-term VTP. The progressive rightward shift of the distribution curves demonstrates the cumulative impact of the vocational training programme.

The short-term phase produces an immediate improvement in employability, with the distribution shifting rightwards and displaying a higher mean value. This reflects the direct impact of skills acquisition and vocational certification. The long-term phase generates an even more pronounced shift, indicating that the combination of training and work experience significantly enhances employment prospects. The broader distribution in the long-term phase also suggests greater differentiation in employability levels, as individuals leverage their training to varying degrees based on personal characteristics and market opportunities.

Several key insights emerge from this analysis. Firstly, the programme demonstrates lasting benefits that extend beyond the immediate training period. The 60 per cent increase in employability by the long-term phase suggests that vocational training creates sustainable improvements in labour market outcomes. Secondly, the construction sector focus aligns with Senegal's infrastructure development priorities, creating synergies between social protection and economic development objectives. Thirdly, the targeting of young NEETs addresses a critical demographic challenge, converting potential social liabilities into productive assets.

The integrated design of scenario 4 highlights the potential of combining immediate poverty relief with structural interventions. While public works provide crucial short-term income support, vocational training addresses the

underlying barriers to employment that perpetuate poverty. This dual approach recognizes that sustainable poverty reduction requires both immediate relief and long-term capability enhancement.

The analysis also reveals implementation considerations, however. The success of the vocational training component depends on the quality of training provision, the relevance of skills to market demands and the availability of construction sector jobs. The stipend granted during training (20,000 XOF monthly) must be sufficient to enable participation while avoiding work disincentives. Additionally, the programme's focus on construction sector skills should be evaluated regularly to ensure alignment with evolving labour market needs.

These findings underscore the value of integrated social protection approaches that address both immediate needs and structural barriers to economic inclusion. The combination of public works and vocational training represents a promising model for breaking intergenerational poverty cycles while contributing to national development objectives.

4.5. Financing considerations

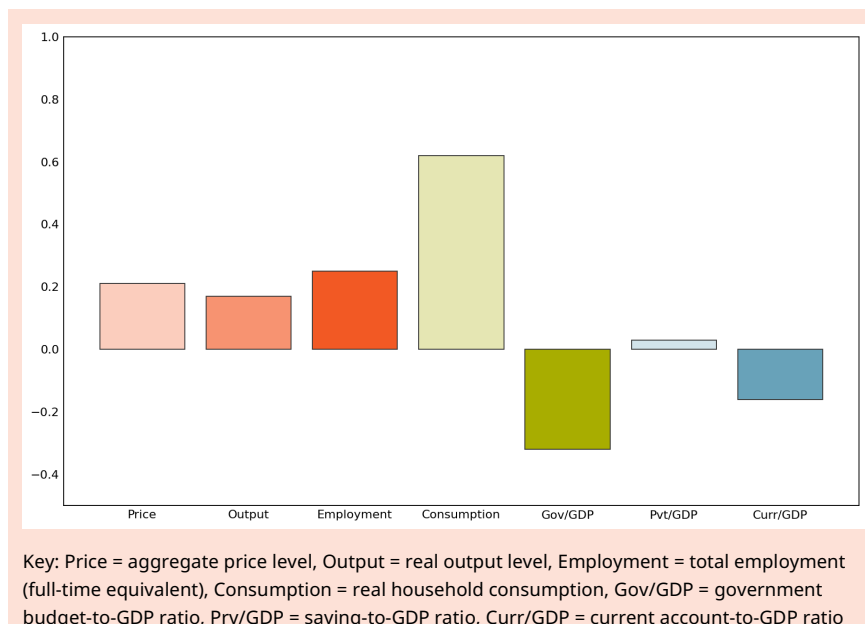
The implementation of social protection programmes requires careful consideration of financing mechanisms and their macroeconomic implications. While the microsimulation analysis reveals a positive impact on poverty reduction and employment, sustainable financing is essential for programme viability and economic stability. This section examines three potential financing approaches using the SMSD framework to assess their macroeconomic effects.

For illustrative purposes, the analysis focuses on financing scenario 2 (the cash bridge to eliminate extreme poverty), which requires an additional 55 billion XOF. The three financing mechanisms examined are financing through reduced net government savings, financing through increased tax on corporate profits and financing through increased value added tax (VAT). Similar analyses can be conducted for other scenarios.

4.5.1. Net government savings approach

This approach involves financing social protection programmes through a reduction in government savings, effectively increasing deficit spending. The macroeconomic simulation reveals predominantly positive short-term effects, with price levels increasing by 0.2 percentage points, reflecting moderate inflationary pressure. Output expands by 0.17 percentage points, driven by increased government spending, while employment grows by 0.25 percentage points, representing the strongest employment response among all the financing options. Consumption rises by 0.62 percentage points, indicating a robust demand stimulus. The government balance-to-gross domestic product (GDP) ratio decreases by 0.32 percentage points, while private investment and current account remain relatively stable.

► **Figure 4.5.1. Macroeconomic impact of financing by net government savings (change in percentage points)**



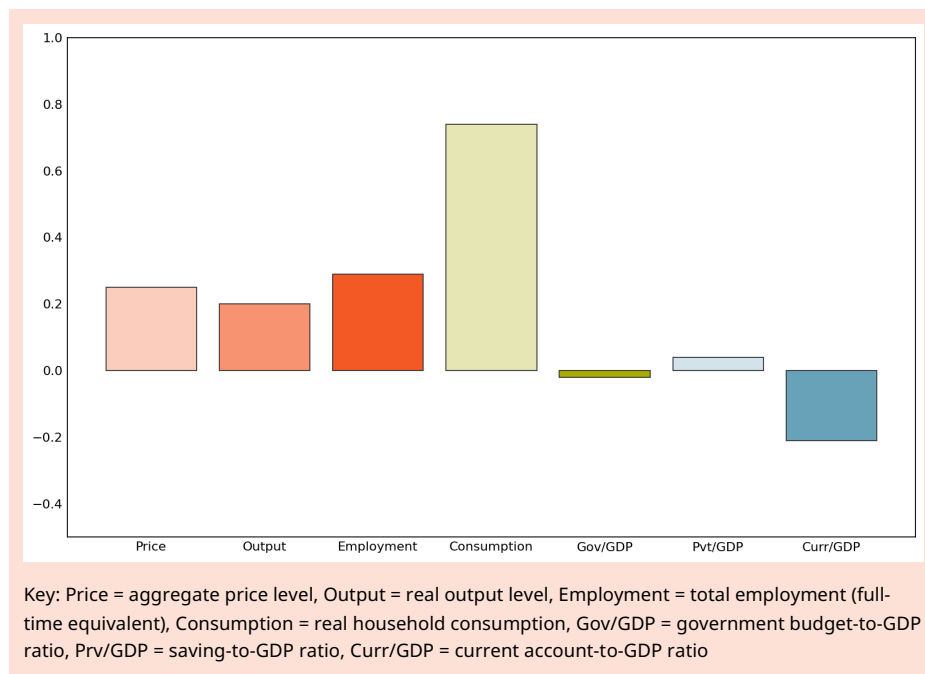
Source: ILO calculations using the SMSD

The expansionary nature of deficit financing generates the most favourable short-term economic outcomes, with multiplier effects stimulating growth and employment. This approach, however, raises critical questions concerning fiscal sustainability. The feasibility of sustained deficit financing depends on Senegal's current debt levels, borrowing costs and available fiscal space. While international financial institutions may support social protection initiatives, continuous deficit accumulation could constrain future fiscal flexibility and potentially trigger debt sustainability concerns.

4.5.2. Increased tax on corporate profits

This approach maintains fiscal neutrality by matching increased social protection expenditure with higher corporate tax revenue. The simulation results show similar positive effects on price levels (+0.2 percentage points), output (+0.17 percentage points) and consumption (+0.62 percentage points) as the deficit financing approach. Employment growth reaches 0.25 percentage points, matching the deficit financing scenario, while the government balance-to-GDP ratio remains neutral as revenues offset expenditures. Firms' savings, however, decrease significantly, by 0.36 percentage points.

► **Figure 4.5.2. Macroeconomic impact of financing by increased tax on corporate profits (change in percentage points)**



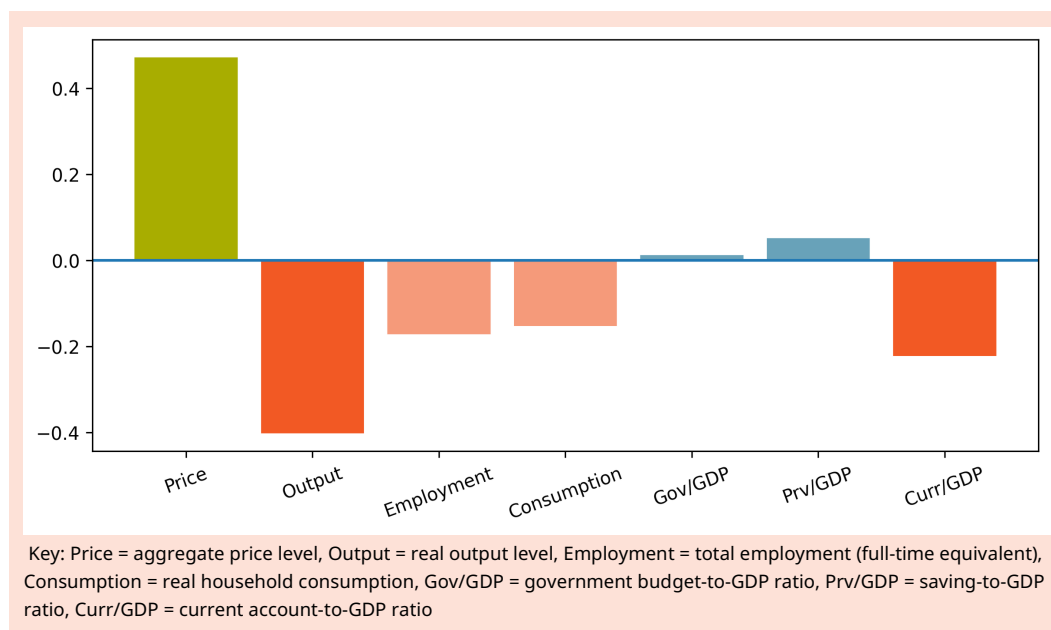
Source: ILO calculations using the SMSD.

While this approach preserves fiscal balance, the reduction in corporate savings raises concerns about long-term economic dynamism. Lower retained earnings may discourage private investment, potentially constraining future productivity growth and employment creation. The magnitude of this effect depends on factors such as the existing corporate tax burden, profit margins across sectors and the economy's reliance on private investment for growth. To mitigate the risk of investment contraction while maintaining adequate social protection funding, complementary policies could be considered. These might include targeted investment incentives for sectors aligned with national development priorities, public-private partnership frameworks that leverage government resources to crowd in private investment or differentiated tax rates that protect small and medium-sized enterprises while ensuring that larger corporations contribute their fair share. Such measures could help maintain private sector dynamism while generating the necessary resources for social protection programmes.

4.5.3. VAT increase

This approach finances social protection through broad-based consumption taxation. The simulation reveals markedly different macroeconomic outcomes, with a substantial increase in price levels of 0.47 percentage points, more than double the inflationary impact of the other approaches. The analysis shows negative effects on output (-0.4 percentage points), employment (-0.16 percentage points) and consumption (-0.15 percentage points). Fiscal neutrality is maintained with no change in the government balance-to-GDP ratio, while corporate savings and investment incentives are preserved.

► **Figure 4.5.3. Macroeconomic impact of financing by value added tax (change in percentage points)**



Source: ILO calculations using the SMSD.

The VAT increase generates the most adverse short-term macroeconomic impact through cost-push inflation. Higher consumer prices reduce household purchasing power, leading to decreased consumption and economic contraction. This contractionary effect partially offsets the poverty reduction benefits of the social protection programmes, creating policy tension. Furthermore, price increases caused by VAT increases tend to affect poorer households disproportionately due simply to the fact that those households have a higher consumption (and lower saving) propensity; such an effect is called “forced saving”. VAT financing offers advantages, however, in terms of fiscal sustainability and the preservation of investment incentives. The regressive nature of VAT could be mitigated through exemptions for essential goods or complementary measures to protect vulnerable households.

The comparative analysis reveals fundamental trade-offs in financing social protection. The choice between short-term growth and fiscal sustainability is evident in the contrast between deficit financing, which maximizes immediate economic benefits, and the more fiscally prudent approaches that risk long-term stability. The appropriate balance depends on Senegal's current fiscal position, debt sustainability metrics and access to concessional financing. The tension between social protection objectives and investment incentives becomes apparent when considering corporate tax increases, while the simplicity of VAT increases must be weighed against their regressive effects. The appropriate financing mix ultimately depends on Senegal's specific circumstances, including its current fiscal position, investment needs and social protection priorities.

5. Conclusions and policy recommendations

This integrated assessment using the SMSD framework provides valuable insights into the social and economic impact of investment operations and social protection policies in Senegal. The analysis reveals complex interactions between investment-driven growth, social protection programmes and financing mechanisms, offering important lessons for policy design and implementation.

It should be noted that this study represents an initial and rapid assessment of a selected sample of interventions relevant to Senegal's development road map under the Global Accelerator initiative. While focusing on key investment operations and social protection programmes, the analysis also serves to demonstrate the analytical capabilities of the SMSD framework. More comprehensive and in-depth assessments can be undertaken in subsequent phases with enhanced data availability, expanded policy scenarios and refined modelling techniques to provide even more detailed guidance for policy formulation in tripartite social dialogue.

The employment and household impact analysis demonstrates that Senegal's planned investments under its National Development Plan (2025–29) in the areas of agriculture and infrastructure have significant potential for job creation, with the projected generation of 145,453 temporary and 51,067 permanent jobs. However, the predominance of informal employment (representing 61.2 per cent of temporary and 70.7 per cent of permanent jobs) highlights persistent structural challenges. The social protection programme assessment reveals differentiated impact across household types, with the extreme poverty elimination programme achieving its objective and the public work and training programme demonstrating the strongest comprehensive impact. The financing analysis underscores that each funding mechanism has distinct implications for short-term stimulus and fiscal sustainability while requiring careful design to ensure compatibility with long-term growth objectives.

Based on this rapid analysis, three interconnected policy priorities emerge. Senegal should implement a multi-tiered social protection system that combines universal basic coverage with targeted interventions, including maintaining the existing cash transfer programme as a foundation while adding specialized programmes such as healthcare subsidies for individuals with disabilities, and vocational training components, which demonstrated significant employability improvements. This system should be supported by a balanced financing strategy that distributes the fiscal burden across multiple sources – combining moderate deficit financing within sustainable limits, progressive taxation with appropriate exemptions and systematic improvements in public expenditure efficiency – with regular reviews based on evolving economic conditions. Simultaneously, investment strategies must explicitly target formal employment creation by designing public investments to maximize formal job opportunities, implementing complementary policies to incentivize business formalization and ensuring that infrastructure investments facilitate formal sector development, building on the encouraging finding that investment operations achieved relatively higher formality rates compared to the national baseline.

In conclusion, achieving Senegal's development objectives requires an integrated approach that recognizes the synergies between economic growth, decent job creation and social protection. The SMSD analysis demonstrates that carefully designed interventions, when properly financed and effectively implemented, can generate mutually reinforcing benefits across these domains. Success depends on strong political commitment, effective institutional coordination and sustained investment in implementation capacity. By adopting these recommendations, Senegal can advance towards a more inclusive and sustainable development path that combines economic growth with social justice.

► References

ANSD (Agence Nationale de la Statistique et de la Démographie). 2022. *Matrices de Comptabilité Sociale du Sénégal pour les Années 2014 à 2019*. <https://www.ansd.sn/Indicateur/matrice-de-comptabilite-sociale-mcs>.

ANSD (Agence Nationale de la Statistique et de la Démographie). Enquête harmonisée sur les conditions de vie des ménages (EHCVM), 2021–2022, Senegal.

DGPPE (Direction Générale de la Planification et des Politiques Économiques). 2022. *Sénégal 2050: Stratégie Nationale de Développement 2025–2029*. https://plandev.sn/index.php?option=com_phocadownload&view=category&download=102:senegal-2050-strategie-nationale-de-developpement-2025-2029&id=1:publications-recentes&Itemid=156.

Jiang, Xiao, and Massimiliano La Marca. 2023. *Employment impact assessment of the Zambian Great North Road Upgrading (GNRU) project*. ILO. <https://www.ilo.org/publications/employment-impact-assessment-zambian-great-north-road-upgrading-gnru>.

► Appendix. Impact of scenario 4, first component



Source: ILO calculations.

The Global Accelerator is a UN initiative that aims to support countries in creating millions of decent jobs primarily in the green, digital, and care economies, and to extend social protection to billions of people who are currently excluded. It aims to accelerate progress towards the Sustainable Development Goals and increase investments to promote decent jobs, universal social protection and just transitions.

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