



Study on Framework for Introduction of National Social Insurance Scheme in Bangladesh

Social Security Policy Support (SSPS) Programme

Cabinet Division

and

General Economics Division of Bangladesh Planning Commission

Government of the People's Republic of Bangladesh



*Empowered lives.
Resilient nations.*

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This study report has been prepared by PwC under the guidance of the General Economics Division of the Bangladesh Planning Commission to serve the NSSS reform purpose of the Ministry of Labour and Employment, and Financial Institutions Division and Finance Division of the Government of Bangladesh.

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1. Introduction

1.1. Brief overview of the economy

Bangladesh has been witnessing a steady upsurge in economic growth over the last decade. According to World Bank databank, the economic growth has been above 5.5% since FY 2010 and has clocked 7.8% in FY 2018, thereby making it one of the fastest growing nations globally. The per capita income of Bangladesh has increased from \$1,610 in FY 2017 to \$1,751 in FY 2018, and poverty rate has reduced substantially from 18.50% in FY 2010 to 13.80% in FY 2016.

Even though Bangladesh has made laudable economic strides, however progress made across certain socioeconomic parameters, especially those related to social protection landscape, require attention. Incidence of unemployment, particularly related to female unemployment, extreme poverty and existence of high levels of income inequality indicate existence of vulnerable populations in the country despite recent economic prosperity at national level. Thus, implementation of a robust social security system in Bangladesh will help to overcome the inherent bottlenecks and further inclusive economic growth, which would further result in achieving the Sustainable Development Goals (SDGs).

1.2. Social protection landscape of Bangladesh

The Government of Bangladesh (GoB) has accorded high importance and priority to implementation of social security programmes in various phases of their strategic planning. The Sixth and Seventh Five Years Plans (FYPs) had designated social protection as Public Investment Priority (*source: 6th FYP and 7th FYP of GoB*). The GoB has doubled the budgetary allocation towards Social Safety Net Programmes (SSNPs) over the upcoming five financial years (*source: budget speech of Minister of Finance, GoB for FY 2019-20*).

Despite enhanced prioritization of social protection programmes and schemes by GoB, approach for implementation of these schemes and programmes lacks a strategic roadmap and guideline, thereby resulting in non-inclusive and sporadic implementation. The current social security landscape in Bangladesh, which comprises 114 programmes that are managed by 35 ministries, is fragmented (*source: Social Safety Net Programs 2018-19, Ministry of Finance*). This approach has yielded sub-optimal results; for instance, there has been several instances duplication of programmes with similar objectives leading to low budget allocation for individual programmes. Limited budgetary allocation results in partial coverage of the schemes, which eventually leads to sub-optimal achievement of programme goals and objectives. In addition, high degree of targeting errors also plague the social security landscape; these have resulted in exclusion of 3/4th poor and vulnerable households from the coverage of SSPs (*source: Household Income and Expenditure Survey (HIES) 2016*).

1.3. Rationale for implementation of a social security programme

With the goal of building an efficient and inclusive social protection floor, the Planning Commission of GoB devised a comprehensive **National Social Security Strategy (NSSS)** to build a social protection floor by identifying and categorizing the needs and priorities of social assistance and insurance according to different life cycle group (*source: NSSS document, July 2015*). The NSSS envisions the establishment of a **National Social Insurance Scheme (NSIS)** that will be regulated under the **Insurance Act 2010** and governed by **Insurance Development and Regulatory Authority of Bangladesh (IDRA)** under the Bank and Financial Institutions Division of Ministry of Finance. The scheme aims at providing social security benefits to the working-class population and pension to the elderly. In addition, it will address other exigencies (such as **workplace related accident, sickness, unemployment and maternity**) for both the elderly as well as the working-class populations in Bangladesh.

1.4. Scope of the engagement

Two key components of the NSSS are the focus areas of this engagement creating a framework for introduction of National Social Insurance Scheme (NSIS) and Private Voluntary Pensions (PvP) in Bangladesh. The scope of work of the engagement aims to explore options to develop NSIS and a PvP schemes through focusing on four areas such as (a) financing options; (b) implementation feasibility; (c) institutional structure of the proposed implementing

and management authority; and (d) mode of operationalization. Within NSIS, the design of schemes across select verticals, such as workplace related unemployment, injury, sickness and maternity, have been taken into consideration. Similarly, a design framework for PvP has been considered.

The detailed scope of the engagement is as follows:

- Review and analyse NSSS provisions and its objectives related to social insurance schemes
- Conduct a comparative analysis to assess international good practices in terms of implementing national social insurance schemes that can be contextualized to Bangladesh
- Develop implementable scenarios (including indicative financial implications, and pros and cons) to implement NSIS and PvP
- Design a framework to implement NSIS and PvP

1.5. Overview on previously submitted output

In the inception phase, the consultants’ team attended a kick-off meeting (held on 9 December 2019) with representatives from United Nations Development Programme (UNDP) to finalise the methodology to undertake activities based on the scope of work for the engagement. Subsequently, the team participated in a series of stakeholder discussions with Insurance Development and Regulatory Authority (IDRA), Federation of Bangladesh Chamber of Commerce and Industry (FBCCI), Dhaka Chamber of Commerce and Industry (DCCI), Bangladesh Employers Federation (BEF), Ministry of Labour and Employment, and Ministry of Social Welfare between 9 to 12 December 2019.

The first deliverable was submitted on the 17 December 2019. It detailed the methodology to be adopted and outlined the preliminary findings from the inception phase.

Brief on the methodology to introduce NSIS and PvP

Introduction of NSIS would be assessed across three scenarios such as solely through contribution of GoB (i.e. universal coverage under which all the beneficiaries will be covered), joint contribution by employer and employee (in formal sector alone) and a combination of these two scenarios with joint contribution by employees (in both formal and informal sectors), the GoB, and employers of the formal sector covering the entire spectrum of working population. In assessing each of these scenario, four key considerations would be incorporated in our analysis such as identification of the target sectors and establishments, determine qualifying criteria, determine contribution mechanism and key structural factors (including the count of beneficiaries, quantum of contribution, quantum of benefits and associated financial costs) in each focus area.

To introduce a framework for PvP, three activities would be undertaken such as determine the count of beneficiaries, determine the quantum of benefits and contribution and disbursement mechanisms, and conduct viability assessment of regulatory authority.

Brief on the content of the previously submitted report

In the previously submitted report, we outlined the estimated fiscal space required to implement PvP and NSIS. In addition, we determined the count of beneficiaries for both NSIS and PvP. The preliminary analysis on fiscal space and count of beneficiaries is given below.

Underlying assumptions behind estimation of fiscal space and count of beneficiaries

For any statistical projection, there are several underlying assumptions which are required to be considered. These assumptions help in increasing the confidence level of our estimates. Considering the same, **Table 1** outlines the underlying assumptions related to our estimation.

Table 1: Assumptions related to estimation of fiscal space and count of beneficiaries

Focus Areas	Assumptions
Estimation of fiscal space for GoB	1. The budget size of GoB has increased from 16% of nominal GDP (in FY2015-16) to 18% of nominal GDP (in FY 2018-19). It means that the budget size has grown at an average of 0.5 percentage points vis-à-vis

Focus Areas	Assumptions
	<p>nominal GDP annually. We have assumed that a similar trend will be followed in ensuing financial years.</p> <p>2. Over the past four years, the total budget allocated for social spending has increased on an average of 0.37%. We have assumed that similar trend will be implemented in ensuing financial years for social protection projects (includes all projects under NSSS framework)</p> <p>3. It is assumed that NSIS and PVP would be implemented from FY 2020-21.</p>
<p>Estimation of the count of beneficiaries</p>	<p>1. The annual growth rate of total employed persons has been 5% over last 3 years (i.e. 2016 to 2018). Hence, the annual average growth of employed person was 1.55%. We assume the same trend will follow in upcoming years.</p> <p>2. We assume that the ratio of formal to informal employment will remain same in the medium term (i.e. 14:86)</p> <p>3. The gender ratio in FY 2016-17 was 1.01 for the whole population. We have assumed that the ratio will remain constant over the medium term.</p> <p>4. For the employed population, the gender ratio (i.e. male: female) has decreased from 2013 to 2016 (i.e. 2.40 to 2.26). In this context we have assumed a conservative scenario where in the gender ratio remains same as that of 2016.</p> <p>5. The fertility rate for the last two years remained constant at 2.05. Similar trend is assumed to be followed in the medium term. Additionally, the reproductive age is assumed to remain at 18 years and menopause age is assumed to be 50 years.</p> <p>6. Since 2010, the labour force as a percentage of the total population has remained constant at 39%. Similar trend is assumed to be observed over the medium term.</p> <p>7. Since 2010, the average annual growth of the unemployment rate (as a % of labour force) was 4.17%. It is assumed that similar growth rate will continue over the medium term.</p> <p>8. It is assumed that the count of unemployed people in the formal and informal sector are distributed in the same ratio as the total employment in the formal and informal sectors respectively</p>

Brief on the methodology adopted to estimate fiscal space

We have estimated the nominal GDP over the medium term based on the available historical data and considering the relevant assumptions on the growth rate of GDP. From the estimated nominal GDP, the estimated fiscal spending on the current social security programs was arrived upon considering the financing assumption of NSSS strategy as underlined in the NSSS action plan¹. Additionally, we estimated the budget size of the country in the medium term which in turn was used to determine the expected social security spending based on the trend analysis of the historical data. Finally, the difference between the estimated social security spending and budgetary allocation for the current social security programs (SSPs) gave us the estimated fiscal space.

¹ “The financing assumption of NSSS is based on keeping the spending on Social Security Programmes constant as 2.3 per cent share of GDP” - taken verbatim from NSSS Action plan

Estimation of fiscal space required to be made available

- The initial fiscal space that is required to be made available by GoB in FY 2020-21 amounts to 193.87 billion Bangladeshi Taka (BDT), which accounts for 0.71 % of the GDP. The fiscal space will gradually increase to 377.53 billion BDT, which accounts for 1.17% of the GDP in FY 2023-24.
- If there is a consolidation of the SSPs with similar scope, an additional fiscal space of amount 310.66 billion BDT would be created in FY 2020-21.

The calculations for estimation of fiscal space is given in Annexure 2.

As a part of our preliminary analysis, we have estimated the count of beneficiaries across the focus areas of NSIS. The output of this analysis would form a crucial input in designing the final statistical model to compute the expected cost for three possible scenarios (i.e. universal coverage, employer-employee contribution, and co-contributions by government, employer and employee). The steps that we have followed to estimate the count of beneficiaries are given below:

1. **Sickness:** We have assumed that the count of beneficiaries under this focus area is a function of the population and the morbidity rate. The formula used to arrive at the count is given below:

$$\text{Count of beneficiaries} = \text{Population} * \text{morbidity rates}$$

The count of beneficiaries, or the target eligible population, is dependent on the percentage of employees falling sick. We have considered the morbidity rates of the Bangladesh to assess the percentage of employees falling sick. The population forecast of Bangladesh was available from the IMF database². However, in the absence of any recent data on morbidity rate, the values were obtained in the Health and Morbidity survey 2014 and was assumed to be remain same over medium term.

Based on our estimation, the count of beneficiaries is estimated to be 19.03 million (for schemes where GoB is the sole contributor), 1 million (for schemes involving joint contribution by employer and employee), and 7.2 million (for schemes involving co-contributions between government, employer and employee).

2. **Maternity Insurance:** To estimate the beneficiaries for the maternity insurance, we have used the fertility rates. The fertility rate represents the number of times a woman is likely to avail the maternity benefits in her entire lifetime. This is an independent variable which was used to calculate the average number of births by a woman per year using the following formula

$$\text{Average number of birth per woman per year} = \frac{\text{Fertility rate}}{\text{Menstrual age} - \text{Maturity age}}$$

The computation of the number of beneficiaries will then follow as

Count of beneficiaries

$$= \text{Women population in Bangladesh} * \text{average number of birth per woman per year}$$

The estimated count of beneficiaries amounts to 5.36 million (for schemes where GoB is the sole contributor), 0.096 million (for schemes involving joint contribution by employer and employee) and 1.25 million (for schemes involving co-contributions between government, employer and employee).

3. **Employment Injury Insurance:** Our estimation of the beneficiaries for the employment related injury insurance is derived from the feasibility study of ILO on the employment injury and survey conducted by BIDS on workplace accidents. The formula used to determine the number of beneficiaries is given below:

$$\text{Count of beneficiaries} = \text{target population} * \text{incident rate}$$

It should be noted that the insurance cannot be implemented universally. The estimated count of beneficiaries is 0.059 million (for schemes involving joint contribution by employer and employee) and 3.76 million for a mixed strategy (for schemes involving co-contributions between government, employer and employee).

4. **Unemployment:** Our unemployment forecast is based on some of the assumptions as stated in **Table 1**. Based on these assumptions, the formula used to arrive at the count of beneficiaries is given below:

² IMF economic outlook

Count of beneficiaries = unemployment as a % of labour force * total labour force

The estimated count of beneficiaries in the contributory type schemes amounts to 0.38 million, whereas the estimated beneficiary for schemes involving co-contributions between government, employer and employee is estimated to be 2.74 million.

Table 2: Coverage of the proposed schemes under NSIS

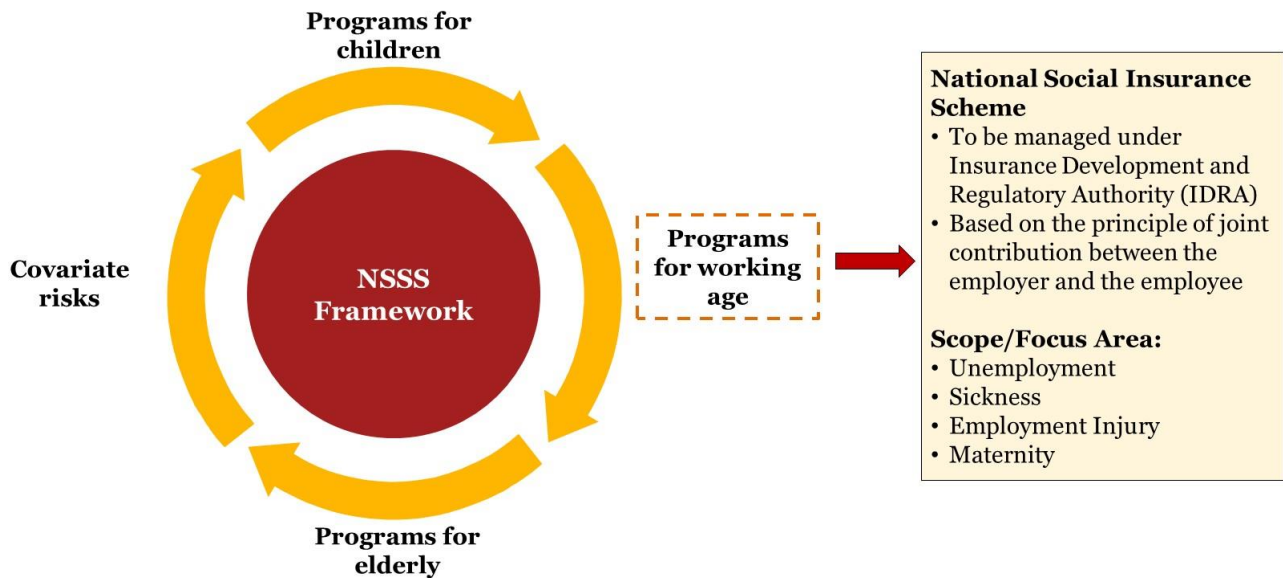
S.L.	Scheme	Nature of the scheme	Coverage (or count of beneficiaries) for FY 20 (in million)
1.	NSIS to cover for unemployment	Coverage for the working population in formal sector	0.39
		Coverage for entire working population (formal as well as informal)	2.77
2.	NSIS to cover for sickness	Universally rolled out	12.89
		Coverage for the working population in formal sector.	1.01
		Coverage for entire working population (formal as well as informal)	7.25
3.	NSIS to cover for maternity	Universal rolled out	5.42
		Coverage for the working population in formal sector.	0.10
		Coverage for entire working population (formal as well as informal)	1.27
4.	NSIS for cover for employment related injury	Coverage for the working population in formal sector	0.06
		Coverage for entire working population (formal as well as informal)	3.88

The detailed calculation is appended in Annexure 3.

2. Proposed framework for NSIS

As outlined in section 1, the GoB has developed a comprehensive framework of National Social Security Strategy (NSSS) to address the emerging issues and challenges related to social security in Bangladesh. The NSSS framework strives to build an inclusive social security system for citizens of Bangladesh to prevent poverty and inequality, and contribute to all-inclusive human development, employment and economic growth³. This framework categorises the social security needs of the citizen into various life cycle phases (refer **Figure 1**).

Figure 1: NSSS framework (Source: NSSS Document and ABCD of social protection)

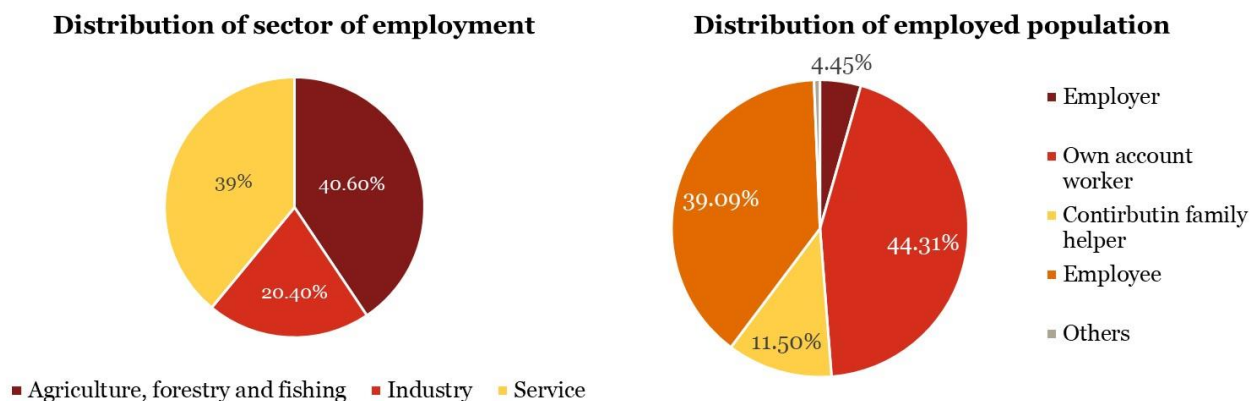


As outlined section 1.5, the strategy to implement NSIS is dependent on several key parameters including the *target sectors*, *contribution mechanism*, *policy framework*, and *procedures*. In this section, we have focused on each parameter to arrive at the contribution rate and benefits under NSIS.

2.1. Target establishments and coverage of schemes

In order to arrive at the coverage of the NSIS, it is essential to present an outline on the demographic profile of Bangladesh. In Bangladesh, 67.6% of the total population (or 109 million people) comprises working age population. Out of this, 58.20% of the population could be classified as economically active adults (i.e. those population who are actively contributing to economic growth)⁴. The distribution of these workforce across key parameters is shown in **Figure 2**.

Figure 2: Key distributions of the employed population



Source: Labour Force Survey 2016-17

³ Source: NSSS Document, July 2015

⁴ Labour Force Survey 2016-17

As evident from Figure 2, most of the economically active adults are employed in the agricultural, forestry and fishing sector (i.e. 40.60% of total working population), which is followed by service sector (i.e. 39% of the workforce) and industrial sector (i.e. 20.40% of the total workforce). Amongst the industrial sector, the manufacturing and construction sub-sectors remain the major contributors to the total employment (note: they employ 14.4% and 5.6% of the total workforce respectively). On the other hand, the major contributors of the service sector are wholesale and retail trade sub-sector (which employs 14.2% of the workforce), transportation and storage sub-sector (which employs 8.6% of the total workforce) and education sub-sector (which employs 3.6% of the total workforce).

In terms of type of employer, most (i.e. 44.31% of the workforce) is skewed towards self-employment category. Since the scope of NSIS covers all employed population in formal sector (which will gradually extend over to the informal sector in Bangladesh), hence the coverage of the scheme will comprise all the three sectors (i.e. agriculture, industry and services). Additionally, it will also help us to establish a case for a universal type scheme and evaluate its feasibility.

Taking this into consideration, our calculation reflects the expected cost incurred by the contributors in both the cases i.e. when NSIS framework is rolled out to the formal sector and extended for the informal sector. In the latter case, in event there are no employer (such as the case of self-employed workforce), we have assumed that the GoB will play the role of the employer. In addition, we have also examined a scenario in which coverage of some of scheme is universal (e.g. the beneficiaries comprise entire working age population). Considering all circumstances, **Table 3** gives an overview of the coverage of various schemes of NSIS. The detailed computation of these numbers is presented in annexure of the report.

Table 3: Coverage of the proposed schemes under NSIS

S.L.	Scheme	Nature of the scheme	Coverage (or count of beneficiaries) for FY 20 (in million)
1.	NSIS to cover for unemployment	Coverage for the working population in formal sector.	0.39
		Coverage for entire working population (formal as well as informal)	2.77
2.	NSIS to cover for sickness	Universally rolled out	12.89
		Coverage for the working population in formal sector.	1.01
		Coverage for entire working population (formal as well as informal)	7.25
3.	NSIS to cover for maternity	Universal rolled out	5.42
		Coverage for the working population in formal sector.	0.10
		Coverage for entire working population (formal as well as informal)	1.27
4.	NSIS for cover for employment related injury	Coverage for the working population in formal sector.	0.06
		Coverage for entire working population (formal as well as informal)	3.88

(We have envisaged the framework of NSIS to be implemented through any of three scenarios that are explained below:

- **Scenario 1:** This is a universal scheme covering the entire working age population. The quantum of contribution under this scheme will be entirely borne by the government
- **Scenario 2:** This scenario will be implemented by joint contribution between the employer and employee in the formal sector and hence will cover the entire working population in the formal sector

- **Scenario 3:** Under this scenario, all involved stakeholders jointly contribute and the entire spectrum of working population (both formal and informal) are the beneficiaries. In scenario 2 and 3, the GoB will have to bear the administrative expenses to implement and operationalize the schemes)

2.2. Minimum tenure of contribution

To determine the minimum tenure of contribution, we have consulted the Social Security (Minimum Standards) Convention, 1952 (No. 102). To limit the likelihood of misinterpretation and unwarranted application of the conditions of various schemes, the ILO conventions doesn't explicitly mention the minimum eligibility criteria for the schemes. However, the convention states that the eligibility criteria for the schemes should be drafted in line with the legislations of specific countries and broadly driven by macroeconomic profiles. Hence, there is significant variation in the tenure of contribution for similar social insurance schemes and programmes globally.

In order to simplify our theoretical model, we have calculated the tenure of contribution (given in **Table 4**) based on certain assumptions.

Table 4: Approach to determine minimum tenure of contribution required to receive benefits under NSIS

<p>Key assumptions and approach followed to determine minimum tenure of contribution required to receive benefits under NSIS</p>	<p>The calculation of the number of months of contribution required is based on the premise that the claims amount of the beneficiary will be paid from the pooled fund of NSIS (consisting the employee corpus and the employer corpus). For this purpose, let 'x' be the amount of benefit each beneficiary receives and 'n' be the total duration of benefits received for a contribution of a full year (12 months). Let 'r1' be the contribution rate for each individual registered in the scheme and 'r2' be the contribution rate for the employer. Hence, the corpus for the employee is given by</p> <p>Employee's corpus $= \text{Contribution rate of the employee (r1)} * \text{average wage per year} * \text{target population}$ <i>(For details, refer Annexure 5, column numbered '4' (titled 'FY 2019-20'), row numbered '6')</i></p> <p>Similarly, the corpus for the employer is given by</p> <p>Employer's corpus $= \text{Contribution rate of the employer (r2)} * \text{average wage per year of the employee} * \text{target population}$ <i>(For details, refer Annexure 5, column numbered '4' (titled 'FY 2019-20'), row numbered '9')</i></p> <p>However, the pooled fund or the total corpus can be calculated as:</p> <p>Total corpus collected = Employee's corpus + Employer's corpus <i>(For details, refer Annexure 5, column numbered '4' (titled 'FY 2019-20'), row numbered '10')</i></p> <p>Additionally, the net claims likely to be incurred is given by:</p> <p>Total annual claims $= \text{Total benefit amount (x)} * \text{Number of beneficiaries} * \text{Duration of benefits received per year (n)}$ <i>(For details, refer Annexure 5, column numbered '4', row numbered '13')</i></p> <p>Since the claims amount is ought to be paid from the pooled fund, hence</p> <p>Total annual claims ≤ Total corpus collected</p> <p>From this we can find the floor level of duration of benefits received per year as</p> <p>Duration of benefits received $= \frac{\text{The total corpus collected}}{\text{Total benefit amount} * \text{Number of beneficiaries}}$</p>
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(For details, refer Annexure 5, column numbered '4' (titled 'FY 2019-20'), row numbered '14')

The duration of benefits received by the beneficiary is based on the contribution paid in a complete year (i.e. 12 months). **However, our aim is to find the minimum eligibility criteria for satisfying the ILO floor recommendation.**

Hence, we can use the unitary method to calculate the period of contribution required (in years) to receive the minimum duration of benefits as prescribed by ILO. The formula for the same is given by:

$$\begin{aligned} & \text{No. of years of contribution required} \\ & = \frac{\text{Prescribed minimum duration of benefits}}{\text{Duration of benefits received}} \end{aligned}$$

Or No of months of contribution required =
No. of years of contribution required * 12

(For details, refer to Annexure 5, column numbered '4' (titled 'FY 2019-20'), row numbered '16')

The above methodology is true for the scenario covering the entire working population in the formal sector. For a universal scheme, there will not be any such eligibility condition, and **for the scenario involving the entire working population (both for formal and informal sector), total corpus will be determined by the following formula:**

$$\text{Total corpus collected} = \text{Employee's corpus} + \text{Employer's corpus} + \text{GoB's corpus}$$

Where, the GoB's corpus is calculated as:

$$\begin{aligned} \text{GoB's corpus} & = \text{The contribution rate of the government} \\ & * \text{average wage per year of the employees} * \text{target population} \end{aligned}$$

Again, the total annual claims will be given by:

$$\begin{aligned} \text{Total annual claims} \\ & = \text{Total benefit amount (x) * Number of beneficiaries} \\ & * \text{Duration of benefits received per year (n)} \end{aligned}$$

Since the claims amount is ought to be paid from the pooled fund, hence

$$\text{Total annual claims} \leq \text{Total corpus collected}$$

From this we can find the floor level of duration of benefits received per year as

$$\begin{aligned} & \text{Duration of benefits received} \\ & = \frac{\text{The total corpus collected}}{\text{Total benefit amount * Number of beneficiaries}} \end{aligned}$$

Again, our aim is to find the minimum eligibility criteria (or the contribution required) for satisfying the ILO floor recommendation. For this purpose, we again use the unitary method to calculate the period of contribution required based on the minimum number of durations outlined by ILO in their specific conventions. This is given by the formula:

$$\begin{aligned} & \text{No. of years of contribution required} \\ & = \frac{\text{Prescribed minimum duration of benefits}}{\text{Duration of benefits received}} \end{aligned}$$

Based on the above methodology, the eligibility criteria for various social insurance schemes are given below. The variables used to determine the minimum tenure of contribution to receive benefits under various social insurance schemes, along with the methodology is given in Annexure 5.

Table 5: Eligibility criteria across NSIS

Schemes	Eligibility criteria																																																																
Sickness	<p>The methodology to determine the tenure of contribution is given below:</p> <p><i>Methodology to determine tenure of contribution:</i></p> <p>From the average monthly wage per employee and their contribution rates, the total annual contribution per employee was determined (using the formula: <i>contribution rate * average wage per person * 12</i>). Subsequently, we estimated the corpus of contribution from employees (using the formula: <i>average contribution per employee per year * target population⁵</i>). Similarly, the employer’s corpus was determined (using the formula: <i>contribution rate * average wage per employee * 12 * target population</i>). Therefore, the pool of fund will be the aggregated corpus of employees and employers.</p> <p>Subsequently, from the ILO convention no. 130, (which mentions that the quantum of benefit should be at least 60% of the employee’s salary), the quantum of monthly benefit per beneficiary and quantum of daily benefit per person were determined (using the formula: <i>Monthly benefit amount/30</i>). These helped in calculating the quantum of total daily benefit amount (using the formula: <i>benefit amount per day per person * count of beneficiaries</i>). Following this step, we determined the count of days (per year) to receive benefits (using the formula: <i>total benefit amount/ total pooled fund</i>). This amount corresponds to the benefit which an employee is entitled to receive annually. Hence, we used unitary method to determine the minimum tenure of contribution required to receive benefits for 91 days (<i>note: the rationale behind the arriving at 91 days is given in section 2.4</i>).</p> <p><i>Minimum tenure of contribution to receive benefits under the scheme</i></p> <p>From the above calculations, the tenure of contribution comes to be 10 months. This means that a minimum contribution for a period of 10 months is required to avail minimum benefit under the scheme. However, in case the beneficiary fails to make consecutive contribution for the entire duration, a grace period of 6 months should be given to the beneficiary to pay the remaining contribution to avail minimum benefit (<i>note: while Social Security (Minimum Standards) Convention, 1952 mentions on providing a grace period to the beneficiary</i></p> <table border="1" data-bbox="896 494 2072 1061"> <thead> <tr> <th></th> <th>Unit</th> <th>Data Source</th> <th>FY 2019-20</th> </tr> </thead> <tbody> <tr> <td colspan="4">Sickness</td> </tr> <tr> <td>Average monthly wage per person</td> <td>BDT</td> <td>LFS 2016-17 and PwC Analysis</td> <td>15,568</td> </tr> <tr> <td>Contribution of employee per month</td> <td>BDT</td> <td>PwC Analysis</td> <td>155</td> </tr> <tr> <td>Total contribution per employee per year</td> <td>BDT</td> <td>PwC Analysis</td> <td>1,864.67</td> </tr> <tr> <td>Employee corpus</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>16,621.12</td> </tr> <tr> <td>Contribution of employer per month for each employee</td> <td>BDT</td> <td>PwC Analysis</td> <td>155</td> </tr> <tr> <td>Contribution of employer per year for each employee</td> <td>BDT</td> <td>PwC Analysis</td> <td>1,864.67</td> </tr> <tr> <td>Employer corpus</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>16,621</td> </tr> <tr> <td>Total pooled fund</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>33,242.24</td> </tr> <tr> <td>Monthly benefit amount</td> <td>BDT</td> <td>ILO Convention</td> <td>9,341</td> </tr> <tr> <td>Benefit amount per day per person</td> <td>BDT</td> <td>PwC Analysis</td> <td>311.36</td> </tr> <tr> <td>Total benefit amount per day</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>311.09</td> </tr> <tr> <td>No of days of benefits that can be received per year</td> <td>Days</td> <td>PwC Analysis</td> <td>107</td> </tr> <tr> <td>No of years required for 91 days of benefits</td> <td></td> <td>PwC Analysis</td> <td>0.85</td> </tr> <tr> <td>No. of months of contribution required to have 91 days of benefits</td> <td>Months</td> <td>PwC Analysis</td> <td>10</td> </tr> </tbody> </table>		Unit	Data Source	FY 2019-20	Sickness				Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568	Contribution of employee per month	BDT	PwC Analysis	155	Total contribution per employee per year	BDT	PwC Analysis	1,864.67	Employee corpus	Million BDT	PwC Analysis	16,621.12	Contribution of employer per month for each employee	BDT	PwC Analysis	155	Contribution of employer per year for each employee	BDT	PwC Analysis	1,864.67	Employer corpus	Million BDT	PwC Analysis	16,621	Total pooled fund	Million BDT	PwC Analysis	33,242.24	Monthly benefit amount	BDT	ILO Convention	9,341	Benefit amount per day per person	BDT	PwC Analysis	311.36	Total benefit amount per day	Million BDT	PwC Analysis	311.09	No of days of benefits that can be received per year	Days	PwC Analysis	107	No of years required for 91 days of benefits		PwC Analysis	0.85	No. of months of contribution required to have 91 days of benefits	Months	PwC Analysis	10
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	to pay the balance contribution, it does not explicitly mention the duration of the grace period. In India, the grace period given to a beneficiary to make the balance contribution is 6 months. Considering this practice, we recommend similar grace period to be given to the beneficiary to make the balance contribution, and to subsequently avail the full minimum benefit under the scheme.)																																																																								
Maternity	<p>Calculations similar to the sickness benefit related scheme were carried out for the maternity insurance scheme. The methodology to determine the tenure of contribution is given below:</p> <p>Methodology to determine tenure of contribution:</p> <p>From the average monthly wage per employee and their contribution rates, the total annual contribution per employee was determined (using the formula: <i>contribution rate * average wage per person * 12</i>). Subsequently, we determined the employee's corpus (using the formula: <i>average contribution per employee per year * target population⁶</i>) and employer's corpus (using the formula: <i>contribution rate * average wage per employee * 12 * target population</i>). Thus, the pooled fund was determined as the aggregate of the employee's and employer's corpus.</p> <p>Next, from the ILO convention no. 183 (which requires that the benefit amount should be at least 2/3rd of the salary of the employee), the quantum of monthly benefit per beneficiary and quantum of daily benefit per person were determined (using the formula: <i>Monthly benefit amount/30</i>). Hence, the total benefit amount per day was determined (using the formula: <i>benefit amount per day per person * number of beneficiaries</i>). Subsequently, the count of days of benefits received annually was computed (using the formula: <i>total benefit amount/ total pooled fund</i>). This amount corresponds to the benefit which an employee is entitled to receive annually. Hence, we used unitary method to determine the minimum tenure of contribution required to receive benefits for 91 days (<i>note: the rationale behind the arriving at 91 days is given in section 2.4</i>).</p> <p>Minimum tenure of contribution to receive benefits under the scheme:</p> <p>According to our calculation, a minimum contribution for 11 months should be made by the beneficiary to avail minimum benefit under the scheme.</p> <table border="1"> <thead> <tr> <th></th> <th>Unit</th> <th>Data Source</th> <th>FY 2019-20</th> </tr> </thead> <tbody> <tr> <td colspan="4">Maternity</td> </tr> <tr> <td>Average monthly wage per person</td> <td>BDT</td> <td>LFS 2016-17 and PwC Analysis</td> <td>15,568</td> </tr> <tr> <td>Contribution per month</td> <td>BDT</td> <td>PwC Analysis</td> <td>121.45</td> </tr> <tr> <td>Total contribution per employee per year</td> <td>BDT</td> <td>PwC Analysis</td> <td>1,457.38</td> </tr> <tr> <td>Employee corpus</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>2,178.44</td> </tr> <tr> <td>Contribution of employer per month for each employee</td> <td>BDT</td> <td>PwC Analysis</td> <td>121.45</td> </tr> <tr> <td>Contribution of employer per year for each employee</td> <td>BDT</td> <td>PwC Analysis</td> <td>1,457.38</td> </tr> <tr> <td>Employer corpus</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>2,178.44</td> </tr> <tr> <td>Total pooled fund</td> <td>Million BDT</td> <td>PwC Analysis</td> <td>4,356.89</td> </tr> <tr> <td>Monthly benefit amount</td> <td>BDT</td> <td>ILO Convention</td> <td>10,378.73</td> </tr> <tr> <td>benefit amount per day per beneficiary</td> <td>BDT</td> <td>PwC Analysis</td> <td>346</td> </tr> <tr> <td>Total benefit amount per day</td> <td>Million BDT</td> <td></td> <td>33.13</td> </tr> <tr> <td>No of days of benefits that can be received in per year</td> <td>Days</td> <td>PwC Analysis</td> <td>132</td> </tr> <tr> <td>No of weeks of benefits received per year</td> <td>Weeks</td> <td>PwC Analysis</td> <td>18.79</td> </tr> <tr> <td>No. of years required to have 16 weeks of benefits</td> <td>Years</td> <td>PwC Analysis</td> <td>1</td> </tr> <tr> <td>No. of months of contribution required to have 91 days of benefits</td> <td>Months</td> <td>PwC Analysis</td> <td>10.22</td> </tr> <tr> <td>Rounding off (in months)</td> <td>Months</td> <td>PwC Analysis</td> <td>11</td> </tr> </tbody> </table>		Unit	Data Source	FY 2019-20	Maternity				Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568	Contribution per month	BDT	PwC Analysis	121.45	Total contribution per employee per year	BDT	PwC Analysis	1,457.38	Employee corpus	Million BDT	PwC Analysis	2,178.44	Contribution of employer per month for each employee	BDT	PwC Analysis	121.45	Contribution of employer per year for each employee	BDT	PwC Analysis	1,457.38	Employer corpus	Million BDT	PwC Analysis	2,178.44	Total pooled fund	Million BDT	PwC Analysis	4,356.89	Monthly benefit amount	BDT	ILO Convention	10,378.73	benefit amount per day per beneficiary	BDT	PwC Analysis	346	Total benefit amount per day	Million BDT		33.13	No of days of benefits that can be received in per year	Days	PwC Analysis	132	No of weeks of benefits received per year	Weeks	PwC Analysis	18.79	No. of years required to have 16 weeks of benefits	Years	PwC Analysis	1	No. of months of contribution required to have 91 days of benefits	Months	PwC Analysis	10.22	Rounding off (in months)	Months	PwC Analysis	11
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(Note: 1 month is equivalent to 30 calendar days)

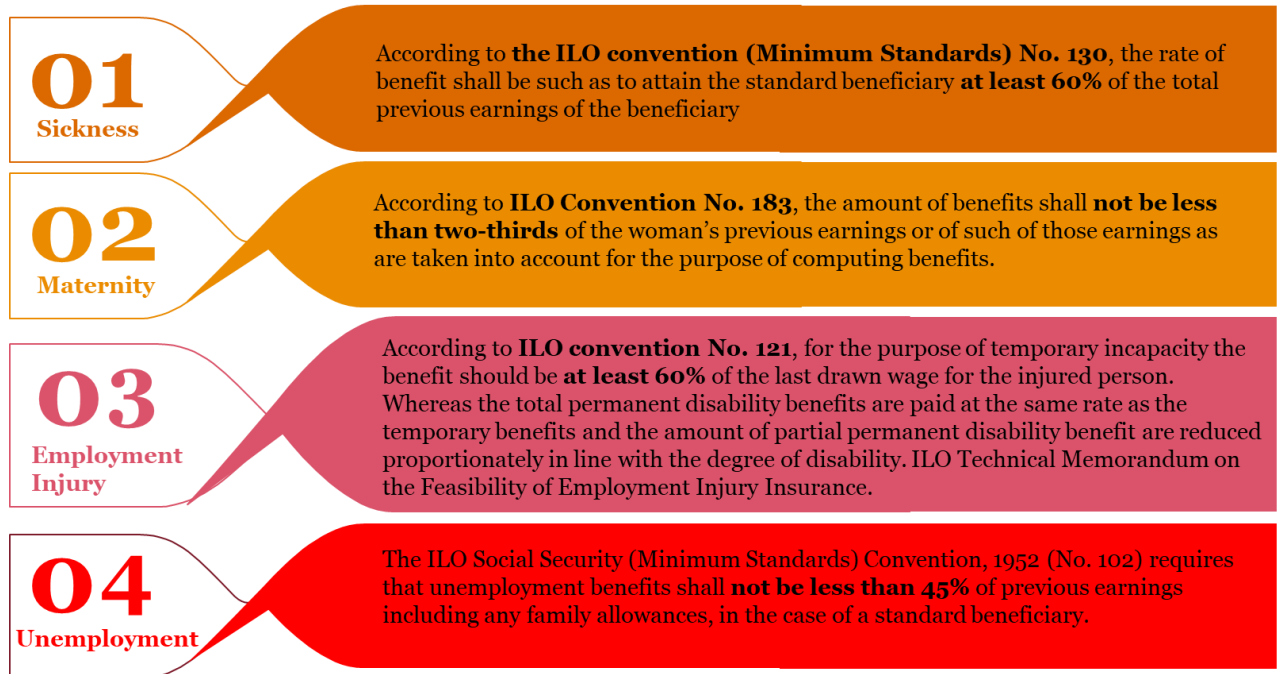
⁸ The target population is the total working population in the formal sector for scenario 2. It amounts to 8.91 million

2.3. Quantum of benefits

One of the most important aspect of the social insurance is the quantum of benefits for the beneficiaries. The International Labour Organization (ILO) defined a minimum level of social security benefits for various insurance categories through its several conventions. The member countries who have ratified these conventions are obliged to maintain at least the basic minimum requirements as laid out in the ILO conventions.

In most of the member countries, the extent of benefits offered to beneficiaries exceeds the floor level set up by ILO. However, owing to the socio-economic constraints of Bangladesh, we have used the ILO recommendations to arrive at the quantum of benefit and contribution rates of beneficiaries. The minimum standards pertaining to the quantum of benefits are represented in **Figure 3**.

Figure 3: ILO minimum standards for the quantum of benefits used in the model



2.4. Duration of receipt of benefits

Apart from the quantum of benefits, the other important parameter in relation to social security schemes are the duration of receipt of benefits. This parameter represents the maximum time until a beneficiary might be able to receive the entitled benefits. Similar to the benefit rates, ILO has recommended floor levels for the duration of receipt of benefits of each scheme. However, this is subject to modification based on the legislative requirements of respective nations. In this regard, Table 6 represents the minimum duration of receipt of benefits of the schemes for beneficiaries.

Table 6: Minimum duration used in our statistical model

Type of Insurance	Duration
Sickness	<p>Waiting period: The waiting period serves the purpose of avoiding the contributors to become beneficiaries of the scheme who are sick for a very short period and are willing to claim the benefits for only a few days. Additionally, implementation of waiting period also reduces the administrative costs for establishing and implementing sickness insurance schemes. The ILO convention recommends establishing a minimum waiting period of 3 days for this scheme.</p> <p>Maximum duration: The ILO convention states that the payment of sickness benefits may be limited to 26 weeks. However, declaration in Article 3 of the same convention (captioned “economy and medical facilities insufficiently developed, claiming a temporary exemption”) mention that the duration of</p>

Type of Insurance	Duration
	payment of sickness benefits may be limited to 13 weeks . We have considered the duration of receipt of benefits to be 13 weeks from date of claiming the benefit .
Maternity	The ILO convention states that the duration of payment of maternity allowance should be at least 12 weeks. However, in the ILO convention no. 183 , the number was revised to a minimum duration of 14 weeks .
Unemployment	The ILO convention no. 102 states that the payment of unemployment insurance may be limited to 13 weeks within a period of 12 months. However, in the convention no. 168 , the corresponding period was revised to 26 weeks .
Employment Injury	No specific duration of roll-out of benefit has been recommended by ILO. However, the benefits should follow throughout the contingency period.

2.5. Financing Mechanism

The premise of the financing mechanism is based on the concept of periodic payments made by the beneficiary. Since wages are paid on a regular basis to the beneficiaries, hence the contribution is calculated as a percentage of wages. Further, the financing amount is determined annually and is dependent upon the financing strategy.

In this section, we have outlined the financial costs associated to implement NSIS schemes. For this purpose, we have proposed three possible financing strategies/ scenarios:

- Scenario 1:** This is a universal scheme covering the entire working age population. The quantum of contribution under this scheme will be entirely borne by the GoB from the tax and non-tax revenue
- Scenario 2:** This scenario will be implemented by joint contribution between the employer and employee in the formal sector and hence will cover the entire working population in the formal sector. In such a scenario, the role of the government would be limited to funding the administrative expenses.
- Scenario 3:** Under this scenario, all involved stakeholders jointly contribute and the entire spectrum of working population (both formal and informal) are the beneficiaries. **In event a worker is engaged in conducting self-employed activities (e.g. an independent consultant, an independent farmer or the like), the GoB plays the role of an employer and bears 80% of the cost.** However, this scheme must be designed to benefit the poor and vulnerable and at the same time must be self-sustainable. Hence, **the government might look into legislative option of introducing an upper capping on the wage of individual, beyond which GoB will not be mandated to pay additional contribution.**

We have analysed each scenario to arrive at an estimated financial cost and corresponding contribution rates for beneficiaries.

2.5.1. Estimated financial costs

This section gives an overview of our adopted methodology for estimation of financial costs regarding NSIS, which is based on the ILO standards and international good practices. In this regard, **Table 7** shows the assumptions in our model.

Table 7: Assumptions of our statistical model

S.L.	Assumptions
1.	The inflation rate is taken as 5.5% ⁹ over the forecasting horizon
2.	Even though an employee works for 6 days in a week, however an assessment conducted by ILO (source: ILO Technical Recommendation on the Feasibility Assessment of an Employment Injury Insurance Scheme in Bangladesh) assumes that an employee works for 30 days in a month.

⁹ IMF Global Outlook 2019

S.L.	Assumptions
	Furthermore, considering the fact that an employee contributes towards her social insurance schemes on non-working days of a month, hence we have assumed that an employee works for 30 days every month. ¹⁰
3.	The ratio of the formal to informal employment will remain the same in the medium term (i.e. 14:86) (note: medium term is considered as 3 forward years from budget year)
4.	The gender ratio (i.e. male: female) in FY 2016-17 was 101:100 for the country. We have assumed that the ratio will remain constant over the medium term.
5.	The annual growth rate of total employed persons has been 4.647% over last 3 years (i.e. 2016 to 2018). Hence, the annual average growth of employed person was 1.55%. We assume the same trend will follow in medium term.
6.	It is assumed that there will not be any major impact of external shocks on implementation of NSIS
7.	The fertility rate for the last two years remained constant at 2.05, which is assumed to remain constant in the medium term. Additionally, the reproductive age is assumed to remain at 18 years and menopause age is assumed to be 50 years.
8.	Since 2010, the labour force as a percentage of the total population has remained constant at 39%. We have assumed that the same rate will prevail over the medium term.
9.	Since 2010, the average unemployment rate (as a % of labor force) was 4.17%. It is assumed that similar growth rate will continue over the medium term.
10.	The unemployment rate for both formal and informal sector is assumed to be the same.
11.	It is assumed that in Scenario 3 (covering the entire working population), the government will act as an employer for the self-employed individuals (44.3% of the total employment) and as a base case will bear 80% of the total cost.

Methodology: In order to arrive at the estimated financial costs and the contribution rates, we have used the following formulas:

Sickness Insurance: Here, the independent parameters are the count of beneficiaries, duration of benefits (in days), and the cost of benefit per beneficiary per day. The formula used to determine the cost incurred to roll-out benefit for the scheme is given below:

$$\text{Benefit cost} = \text{number of beneficiaries} * \text{duration of benefits} * \text{benefit per beneficiary per day}$$

(For details, refer to Annexure 6, sickness, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '7, 13 and 23')

Out of the applicable independent parameters, the count of beneficiaries, or the target eligible population, has been determined in the inception phase of the engagement. The duration of roll-out of benefits for the sickness insurance is taken as 13 weeks or 91 days (refer section 2.4). The cost of benefit per beneficiary per day, which is based on the benefit rate (mentioned in section 1.1), is computed as follows:

Table 8: Computation of benefit received per day per beneficiary under the scheme

Indicators	Units	Data Source	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Average monthly wage per person	BDT	LFS 2016-17	13,258	13,987	14,756	15,568	16,424	17,328	18,281
Benefit per person per month	BDT	PwC analysis	7,955	8,392	8,854	9,341	9,855	10,397	10,968

¹⁰ The document can be accessed at https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_673640.pdf

Indicators	Units	Data Source	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Benefit per person per day	BDT	PwC Analysis	265.16	279.74	295.13	311.36	328.49	346.55	365.61
Net annual income per person	BDT	LFS 2016-17	159,096	167,846	177,078	186,817	197,092	207,932	219,368

Applying all the input parameters in the equation, the cost incurred for rolling out of benefits under the three scenarios are given in Table 9.

Table 9: Cost incurred to roll-out sickness insurance schemes

Scenarios	Financial years (FY)				
	Units	2019-20	2020-21	2021-22	2022-23
Universal Schemes	Million BDT	364,580	388,617	414,237	441,550
Coverage for working population in formal sector	Million BDT	28,562	30,600	32,783	35,122
Coverage for the entire working population	Million BDT	204,015	218,570	234,163	250,869

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee))

Maternity Insurance: Here, the independent parameters are same as that of the sickness insurance scheme i.e. the count of beneficiaries, duration of receipt of benefits (in days), and the quantum of benefit per beneficiary per day. The formula used to arrive at cost incurred to roll-out benefit for the scheme is given below:

$$\text{Benefit cost} = \text{number of beneficiaries} * \text{duration of benefits} * \text{benefit per beneficiary per day}$$

(For details, refer to Annexure 6, maternity, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '7, 13 and 23')

Under this scheme, the beneficiaries are considered as female workforce. The count of beneficiaries has been determined in our inception phase of the engagement (refer section 1.5). Even though according to the ILO recommendations, the minimum duration for which the benefits will be received by the beneficiaries is 14 weeks, however, according to the existing provision in the Labour Law of Bangladesh 2006, the benefits under the scheme will be received for a period of 16 weeks (or 112 days). (Note: According to the ILO's convention no. 183, the maternity insurance covers both one-time cost of childbirth and payment made during the maternity leave duration). The count of beneficiaries for this scheme is mentioned in section 1.5.

The benefit received per beneficiary per day is calculated based on the last drawn wage (refer section 1.1), whose quantum in medium term is given below:

Table 10: Computation of benefit received per day per beneficiary under the scheme

Indicators	Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Average monthly wage of a woman	BDT	12,254	12,928	13,639	14,389	15,181	16,015	16,896
Benefit cost per woman per month	BDT	8,169.33	8,618.65	9,092.67	9,592.77	10,120.37	10,676.99	11,264.23
Benefit cost per woman per day	BDT	272.31	287.29	303.09	319.76	337.35	355.90	375.47

Based on these parameters, the cost to be incurred to implement the maternity insurance scheme is given below.

Table 11: Cost incurred to roll-out maternity insurance schemes

Scenarios	Financial years (FY)				
	Units	2019-20	2020-21	2021-22	2022-23
Universal Schemes	Million BDT	131,407	140,071	149,305	159,150
Coverage for working population in formal sector	Million BDT	219,803	235,484	252,284	270,283
Coverage for the entire working population	Million BDT	44,777	47,972	51,394	55,061

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee))

Unemployment Insurance: Like the above two schemes, the independent factor in the unemployment insurance remains the same i.e., the count of beneficiaries, duration of receipt of benefits (in days), and the quantum of benefit per beneficiary per day. However, since unemployment insurance is meant for beneficiaries who are unemployed provided, they were employed for a certain duration and is searching for employment opportunities, hence the scheme will be applicable to only such type of population. The formula used to arrive at cost incurred to roll-out benefit for the scheme is given below:

$$\text{Benefit cost} = \text{Count of beneficiaries} * \text{duration of benefits} * \text{benefit per beneficiary per day}$$

(For details, refer to Annexure 6 (captioned “unemployment), column no., ‘4 to 7’ (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered ‘8, and 18’)

The count of beneficiaries for this scheme is mentioned in section 1.5. Based on our assessment of the contributory factors, the cost incurred to roll-out the benefit is given in Table 12.

Table 12: Cost incurred to roll-out unemployment insurance schemes

Scenarios	Financial years (FY)				
	Units	2019-20	2020-21	2021-22	2022-23
Coverage for working population in formal sector	Million BDT	16,287	17,361	18,505	19,726
Coverage for the entire working population	Million BDT	116,336	124,006	132,181	140,897

Employment Injury Insurance (EII): Our model for the Employment Injury Insurance builds upon the existing framework suggested by ILO in its technical report¹¹. In line with the recommendations, the EII has been categorized into four sub-components such as temporary disability, permanent disability, partial disability and people receiving health care facilities.

Estimation of cost to be incurred to rollout temporary disability insurance: We have used a simplified model to estimate the cost to be incurred to rollout temporary disability insurance by considering three parameters such as count of beneficiaries, duration of receipt of benefits, and benefit received per beneficiary per day. The EII would be applicable to only those beneficiaries who receive workplace related injury; hence the scenario of universal type coverage doesn’t apply to the model.

The count of beneficiaries is dependent upon the incidence rate and the count of employed population working in the formal sector (i.e. scenario 2) and count of persons in the total working pool (i.e. scenario 3). The count of beneficiaries is derived using the following formula:

$$\text{Count of beneficiaries} = \text{Incidence rate} * \text{count of employed poeple}$$

¹¹ Source: https://www.ilo.org/global/topics/geip/publications/WCMS_712248/lang--en/index.htm

(For details, refer to Annexure 6, employment injury, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '18, and 49')

The incidence rate has been taken from ILO's technical assessment of EII. Based on the data from our initial calculations, the count of beneficiaries is given below:

Count of beneficiaries	Unit	2019-20	2020-21	2021-22	2022-23
Temporary disability	Thousands	54.374	55.216	56.071	56.940
Permanent disability	Thousands	0.392	0.398	0.404	0.411
Partial disability	Thousands	4.252	4.318	4.385	4.453
People having received healthcare facility	Thousands	0.036	0.036	0.037	0.037

The duration of receipt of benefits is taken as 31 days (as recommended by ILO in its technical report). Based on this information, the cost incurred to provide temporary disability benefit is given below:

Scenarios	Financial years (FY)				
	Units	2019-20	2020-21	2021-22	2022-23
	Units	2019-20	2020-21	2021-22	2022-23
Coverage for working population in formal sector	Million BDT	524.83	562.27	602.38	645.36
Coverage for the entire working population	Million BDT	3,864.89	4,119.70	4,391.29	4,680.84

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee))

Estimation of cost to be incurred to rollout permanent disability benefits: To estimate the cost incurred to provide permanent disability insurance benefits, the independent variables considered are the count of beneficiaries, the present value of permanent disability benefits (for lifetime), the expected level of permanent disability, and the benefit cost (owing to the treatment). The formula used to determine the cost incurred to provide the benefit is given below:

$$\text{Total cost} = \text{Count of beneficiaries} * \text{Present Value of permanent disability benefits (for lifetime)} * \text{expected level of permanent disability} * \text{benefit received}$$

(For details, refer to Annexure 6, employment injury, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '24, and 55')

The count of beneficiaries for this scheme is mentioned in section 1.5. The values for the rest of the input variables are taken from ILO's assessment report. We have assumed that the effect of the external factors in these variables in the medium-term will be negligible. Based on values of these parameters, the total cost incurred to rollout the benefit is given below:

Scenarios	Financial years (FY)				
	Units	2019-20	2020-21	2021-22	2022-23
Coverage for working population in formal sector	Million BDT	538	576	617	661
Coverage for the entire working population	Million BDT	3,961	4,222	4,501	4,798

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee))

Estimation of cost to be incurred to rollout partial disability benefit scheme: To estimate the cost incurred to provide partial disability benefit, the independent parameters which were considered include the count of beneficiaries, present value of permanent disability benefits (for lifetime), the expected level of partial disability, and the benefit cost (owing to the treatment). The formula used to determine the cost incurred to provide the benefit is given below:

$$\text{Total cost} = \text{Count of beneficiaries} * \text{Present Value of permanent disability benefits (for lifetime)} * \text{expected level of permanent disability} * \text{benefit received}$$

(For details, refer to Annexure 6, employment injury, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '25, and 56')

Based on values of these parameters, the total cost incurred to rollout the benefit is given below:

Scenarios	Units	Financial years (FY)			
		2019-20	2020-21	2021-22	2022-23
Coverage for working population in formal sector	Million BDT	1041	1,115	1,195	1,280
Coverage for the entire working population	Million BDT	7,665	8,170	8,709	9,283

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee)

Estimation of cost to be incurred to rollout schemes to people having received health care facilities: For this type of benefit, the independent parameters taken into consideration are the count of beneficiaries, expected benefit cost and the present value of care and assistance benefits. The formula used to determine the cost incurred to provide the benefit is given below:

$$\text{Total cost} = \text{Count of beneficiaries} * \text{Present Value of care and assist benefit} * \text{expected benefit received by beneficiaries}$$

(For details, refer to Annexure 6, employment injury, column nos., '4 to 7' (titled 2019-20, 2020-21, 2021-22, 2022-23 respectively), row numbered '28, and 59')

The count of beneficiaries for this scheme is mentioned in section 1.5. The value of the present value of care and assist benefit has been taken from the ILO report and the benefit rate for care and assist is recommended to be at least 50% of the average wage for a worker¹². Based on values of these parameters, the total cost incurred to rollout the benefit is given below:

Scenarios	Units	Financial years (FY)			
		2019-20	2020-21	2021-22	2022-23
Coverage for working population in formal sector	Million BDT	93.25	99.91	107.03	114.67
Coverage for the entire working population	Million BDT	686.73	732.00	780.26	831.71

(Note: In the third scenario i.e. coverage for the entire working population, the government will play the role of the employer for the self-employed individuals (44.3% of the total working population) and the split of the cost will be in the ratio of 80:20 (cost to be borne by government: cost to be borne by employee))

2.5.2. Contribution rates

The quantum of the contribution rates follows from the estimated financial costs of each scheme. The formula governing the computation of contribution rates for various schemes is given below:

¹² ILO convention no. 121

$$\text{Contribution rate} = \frac{\text{Estimated financial costs}}{\text{Total insurable income of the target population}}$$

But since the net contribution rate was determined based on the minimum requirements, hence the **contribution of the employer must be at least half of the required contribution**. Assuming the contribution to be split equally among the employer and the employee, hence the *employer's contribution in scenario 2 can be found out as*

$$\text{Contribution rate for the employer} = \text{contribution rate} * 0.5$$

And the contribution rate for the employee could be found out as:

$$\text{Contribution rate for the employee} = \text{contribution rate} * 0.5$$

For the scenario consisting the whole working population and the contribution is between government and employee, the government contribution can be found as:

$$\text{Contribution rate for the government} = \frac{44.3\% * \text{Estimated financial costs} * 0.8}{44.3\% * \text{target population} * \text{annual avg wage of individual}}$$

(Note: The government is assumed to bear 80% of the total cost incurred for the self-employed individuals, which accounts to 44.3% of the total working population)

Correspondingly, the contribution rate for the employee can be found as:

$$\text{Contribution rate for the employee} = \frac{44.3\% * \text{Estimated financial costs} * 0.2}{44.3\% * \text{target population} * \text{annual avg wage of individual}}$$

Again, for the population having an employer, the contribution rate of the employer can be found as:

$$\begin{aligned} &\text{Contribution rate for the government} \\ &= \frac{(100 - 44.3\%) * \text{Estimated financial costs} * 0.5}{(100 - 44.3\%) * \text{target population} * \text{annual avg wage of individual}} \end{aligned}$$

Correspondingly the employee's contribution can be found as:

$$\begin{aligned} &\text{Contribution rate for the government} \\ &= \frac{(100 - 44.3\%) * \text{Estimated financial costs} * 0.5}{(100 - 44.3\%) * \text{target population} * \text{annual avg wage of individual}} \end{aligned}$$

The estimated financial costs have been determined in section 2.5.1. The insurable income of the target population has been determined using the data provided in LFS 2016-17 and further adjusting it for inflation. As a result, the required contribution rate for scenario 2 and scenario 3 is given below:

Scenarios	Contribution rate for both employer and employee (in % of monthly wage earned by the employee)				
	Sickness	Maternity	Unemployment	Employment Injury	Total contribution
Scenario 2	2.00%	1.56%	1.58%	0.95%	6.11%
Employer Contribution	1.00%	0.78%	0.79%	0.475%	3.055%
Employee contribution	1.00%	0.78%	0.79%	0.475%	3.055%
Scenario 3	1.70%	1.33%	0.13%	0.95%	4.11%
For co-contributions by employer and employee					
Employer Contribution	0.85%	0.665%	0.065%	0.475%	2.055%
Employee contribution	0.85%	0.665%	0.065%	0.475%	2.055%

Scenarios	Contribution rate for both employer and employee (in % of monthly wage earned by the employee)				
	Sickness	Maternity	Unemployment	Employment Injury	Total contribution
For self-employed individuals					
Government Contribution	1.36%	1.06%	0.76%	0.11%	3.29%
Employee Contribution	0.34%	0.27%	0.19%	0.03%	0.82%

Note:

- a) **Scenario 2:** The employee and employer are joint contributors. In such a scenario, the role of the government would be limited to funding the administrative expenses.
- b) **Scenario 3:** Such a scheme covers the entire working population (both formal and informal) and all the three stakeholders viz., GoB, employer and employee are involved in the operational aspects. In such a scenario, for the self-employed individuals, the government will act as an employer and will borne 80% of the cost.

2.6. Summary table on implementation of NSIS

Scheme	Coverage	Eligibility	Benefits	Contributions required by employer and employee	
Sickness	Scenario 1	Universal coverage	No such eligibility criteria	BDT 311 per person for a period of 91 days.	N/A
	Scenario 2	All employees working in the formal sector	Contribution of at least 10 months	60% of the last drawn wage for a period of 91 days.	2.00%
	Scenario 3	Entire working population	Contribution of at least 10 months	60% of the last drawn wage for a period of 91 days.	1.70%
Maternity	Scenario 1	Universal coverage	No such eligibility criteria	BDT 320 per beneficiary for a period of 16 weeks.	N/A
	Scenario 2	All female employees working in the formal sector	Contribution of at least 11 months	2/3 rd of the last drawn wage for a period of 16 weeks.	1.56%
	Scenario 3	Entire working population	Contribution of at least 11 months	2/3 rd of the last drawn wage for a period of 16 weeks.	1.33%
Unemployment	Scenario 2	All employees working in the formal sector	Contribution of at least 86 months	45% of the average salary for a period of 182 days.	0.97%
	Scenario 3	Entire working population	Contribution of at least 86 months	45% of the average salary for a period of 182 days.	0.95%
Employment Injury	Scenario 2	All employees working in the formal sector	Contribution of at least 8 days	Approx. 37,201 BDT per beneficiary	1.58%
	Scenario 3	Entire working population	Contribution of at least 8 days	Approx. 37,201 BDT per beneficiary	0.13%

Note:

- Scenario 1:** This will be a universal scheme covering the entire working age population and the cost under this scheme will entirely be borne by the GoB;
- Scenario 2:** It will be based on joint contribution between the employer and employee in the formal sector and hence will cover the entire working population in the formal sector;
- Scenario 3:** Such a scheme is based on the co-contributions between all the involved stakeholders and covers the entire spectrum of working population (both formal and informal).

2.7. Impact on government finances

The proposed NSIS must be designed in such a way that the cost of operationalization of the said scheme shouldn't create an additional burden on the budget of Government of Bangladesh (GoB). Keeping this in view, we have calculated the expected cost to be incurred to implement each of these schemes under three different scenarios.¹³ However, the calculation of the cost excludes any administrative expenses. The administrative costs will depend upon the amount of resources used to mobilize the scheme and hence, the GoB may think of administering an upper capping to ensure financial sustainability of the scheme in the long term.

Since scenario 1 is based on universal type scheme, hence the entire cost will be borne by the GoB whereas in scenario 2, the GoB will bear no cost apart from the administrative expenses. In scenario 3, the GoB will play the role of an employer where an individual act as a self-employed professional. The percentage of individuals engaged in self-employment activities amounts to 44.3% of the workforce¹⁴, hence our calculation assumes that the GoB will play the role of an employer for these target beneficiaries.

Based on our preliminary analysis of the available fiscal space, if the existing social protection programs are not consolidated, then the available fiscal space amounts to **BDT 193.87 billion**, otherwise it amounts to **BDT 504.53 billion**. This suggests that **the roll-out of universal NSIS is not feasible under the current fiscal situation** without creating an additional burden on the budget. To roll-out the scheme for intended beneficiaries, the cost to be incurred by the GoB will be limited for those cases where the beneficiary is a self-employed professional. Based on distribution of costs to be incurred amongst the beneficiary and GoB, we have analysed 3 situations such as **the base case where the cost is split in the ratio 80:20 (i.e. GoB will bear 80% of the implementation cost of NSIS)**, **best case where the cost is split in the ratio 90:10 (i.e. GoB will bear 90% of the implementation cost of NSIS)** and **the conservative case where the cost is split in the ratio 70:30 (i.e. GoB will bear 70% of the implementation cost of NSIS)**. The cost implication for all the scenarios are given in Table 13.

Table 13: Scenario analysis in case NSIS is rolled out for the entire working population

	Units	Cost to be borne by GoB	Available fiscal space without consolidation	Available fiscal space with consolidation
Best Case (90:10 split)	Billion BDT	471.3	193.8	504.5
Base Case (80:20 split)	Billion BDT	418.9	193.8	504.5
Conservative Case (70:30 split)	Billion BDT	366.6	193.8	504.5

The breakdown of cost to be incurred for implementation of NSIS under base case is outlined in **Table 14**.

Table 14: Cost implication for implementation of NSIS

Cost for operationalization of NSIS for FY 20-21					
	Units	Universal type scheme	Working population in formal sector	Total working population	Cost to be borne by GoB
Sickness	Billion BDT	385.2	30.3	216.6	173.3
Maternity	Billion BDT	140.1	3.7	47.9	38.4
Accidental	Billion BDT	Not applicable	2.4	16.8	13.4

¹³ **Scenario 1:** If NSIS is rolled out as a universal type scheme; **scenario 2:** If the NSIS is rolled out for the working population in the formal sector; **scenario 3:** If the NSIS is rolled out for the entire working population in both the formal and informal sector

¹⁴ LFS 2016

Cost for operationalization of NSIS for FY 20-21					
	Units	Universal type scheme	Working population in formal sector	Total working population	Cost to be borne by GoB
Unemployment	Billion BDT	Not applicable	17.4	124.0	99.2
Total Cost	Billion BDT	525.2	53.7	405.4	418.9

As evident from the Table 13, roll-out of NSIS without consolidation of existing programs is not feasible. However, upon consolidation, the fiscal space provides enough room for accommodating the NSIS schemes for the entire working population (*caveat: in this analysis we haven't considered the administrative costs or the costs to be borne for implementation of Private Voluntary Pensions*).

3. Framework to implement Private voluntary Pension scheme

3.1. Introduction

Social protection in the forms of contributory and non-contributory pension schemes have been ratified by all international organizations as an indispensable financial security method. Universal social protection for old-age people is part of the Sustainable Development Goals (SDG) and the UN 2030 Agenda. In particular, SDG 1.3 aims to implement national social protection systems for all, by providing special attention to the poor and the vulnerable. ILO’s Social Protection Floors Recommendation No. 202 also outlines the need to provide pension. Accordingly, an international consensus has been formed by government agencies, and employers’ and workers’ organizations on the objectives, functions and appropriate design principles of pension systems which has been highlighted in **Figure 4**.

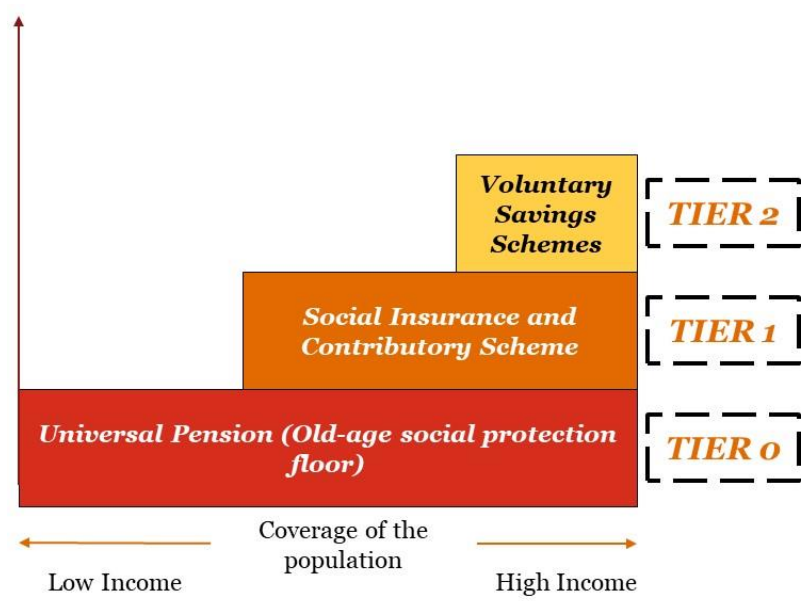
Figure 4: Principles of a Pension Scheme



Overview of three tiers of pension system in Bangladesh

In the aim to develop a pension scheme for Bangladesh, our study focuses on a 3-tiered structure, by incorporating the above principle, to develop a scheme which could bring in the entire population of Bangladesh under its ambit and incorporating ILO recommendations. The tiers are described below:

- TIER 0:** This is a mostly state funded pension scheme with minor contributions from the working class. Such a basic level pension scheme would enable poverty eradication by encouraging savings and stay above the poverty line. Contributions from the working class, even though negligible, would inculcate savings propensity. It’s a social protection floor which guarantees a minimum income security to all the senior citizens in a country beyond a specific age.
- TIER 1:** A mandatory contributory pension scheme funded by employers and employees. It would be rolled out initially to the formal sector. However, in subsequent phases, the informal sector could be brought under its ambit.



Implementing a Defined Contribution (DC) scheme reduces the likelihood of occurrence of shortfall of

contribution. This can be addressed by fixing the contribution rates/ quantum instead of fixing the promised benefits.

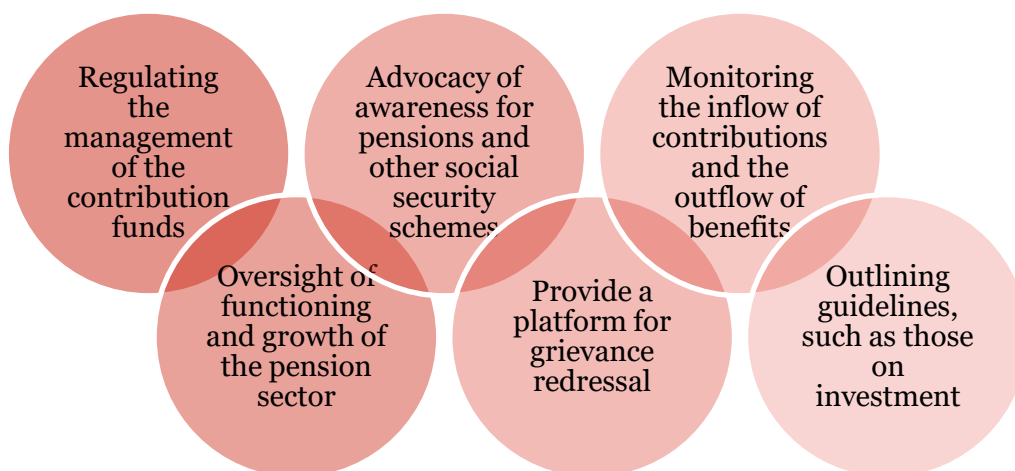
- **TIER 2:** A contributory savings mechanism for individuals with the financial capacity to make additional savings. Any individual, working either in the formal or informal sector, can contribute under this tier. Also, payments made under this tier can be withdrawn even before retirement, either in the form of lumpsum or monthly withdrawals.

	TIER 0	TIER 1	TIER 2
Target sectors	<ul style="list-style-type: none"> • Both formal and informal sector employees • All working age individuals. 	<ul style="list-style-type: none"> • Formal sector employers and employees 	<ul style="list-style-type: none"> • Both formal and informal sector employees • All working age individuals with a savings propensity
Contribution Mechanism	State funded pension scheme with token amount of contributions from the entire working population.	A mandatory Defined Contribution (DC) pension scheme with contributions from employers and employees.	A voluntary contributory pension scheme with contributions from all working individuals willing to save.
Financing	Government budgetary allocations through consolidation of other social security schemes and a token amount from the citizens	Financed by contributions from employers and employees with the government undertaking the administration costs of managing the fund	Financed by contributions from employers and employees with the government undertaking the administration costs of managing the fund

Establishment of an authority for regulation

For the proposed scheme to function smoothly, establishment of a regulatory authority assumes high importance. The role of the regulating authority is highlighted in **Figure 5**. The authority’s responsibilities would range across different dimensions of fund management, handling point of presence, enhancing service delivery, addressing any disputes or grievances, and the like.

Figure 5: Role of the regulating authority



3.2. Count of beneficiaries

Based on assessment of our target sectors and establishments under each of the three proposed tiers, we have estimated the count of beneficiaries across each tier of the pension scheme.

Table 15: Estimate of count of beneficiaries under 3 tiers of pension scheme

TIER	Target Sector	Estimated count of beneficiary (FY 20)	Percentage of total population covered
TIER 0	Working age population across formal and informal sector	114,960,000	68%
TIER 1	Initially, formal sector employers and employees but rolled out to the informal sector gradually	9,050,000	5%
TIER 2	Working age population across formal and informal sector	114,960,000	68%

3.3. Contribution and benefit

We have outlined the contribution rates under the different tiers in this section. Since Tier 2 is a voluntary contribution scheme, the contribution rates will be linked to the savings appetite of the individual.

TIER 0

Considering poverty eradication as the primary objective of implementing social security scheme, the quantum of contribution under ‘Tier 0’ pension scheme should be able to generate a steady revenue stream for the individuals which would help in achieving the objective. In this sub-section, we have estimated the minimum contribution that would be required to attain the objective.

The assumptions used in calculating the minimum quantum of contributions are given below:

- The upper poverty line is taken to be as \$1.90 per day, which is based on the international poverty line identified by World Bank. This serves as an international benchmark, staying above which an individual is expected to ensure a decent standard of living
- The median age of Bangladesh is assumed to be 28. This serves as an indicator of the age demography in Bangladesh¹⁵. The purpose of the median age is to identify an age which is representative of the entire population of Bangladesh, in the process of finding an average contribution amount.
- The rate of return is taken as the average yield of government security bonds having maturity period of 20 years’, whose quantum is 9.655%¹⁶
- The retirement age of Bangladesh’s workforce is assumed to be 60
- Due to the geographical proximity of Bangladesh and India, we have used Indian Assured Lives Mortality (2006-08) Ult
- We have assumed the annuity is payable in arrears
- Values are in the real terms and not inflation adjusted
- The average life expectancy in Bangladesh is taken as 73 years¹⁷
- We have assumed an exchange rate of \$1=BDT 84.91

The actuarial formula used to calculate the contribution rate under ‘Tier 0’ pension scheme is given below:

¹⁵ United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant).

¹⁶ <http://www.worldgovernmentbonds.com/country/bangladesh/>

¹⁷ World Bank databank

$$C = \frac{(v^{32} 32p_{28} P(a_{13|} + 13|a_{60}))}{a_{28:\overline{32}|}}$$

where,

C = Annual contribution amount

i = Rate of return received on the investment

$v = 1/(1+i)$

P = Annual income required to escape the upper poverty line

$a_{13|}$ = A certain annuity payable annually in arrears for the next 13 years calculated at $i\%$

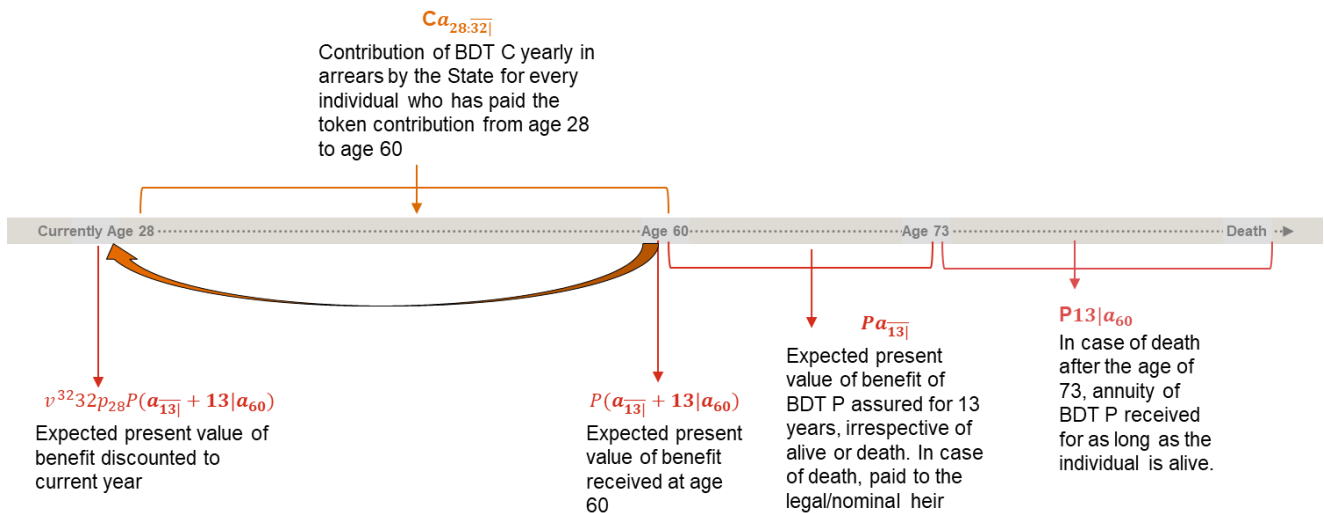
$13|a_{60}$ = A whole life deferred annuity payable in arrears for an individual aged 60 at $i\%$ rate of return

$a_{28:\overline{32}|}$ = A temporary annuity payable annually in arrears for a period of 32 years from an individual currently aged 28 at $i\%$ rate of return

$32p_{28}$ = The probability that a life currently aged 28 will survive for the next 32 years, i.e., till the age of retirement.

Figure 6 presents a schema of the above formula.

Figure 6: Schematic of ‘Tier o’ contribution and benefit



An annuity represents the expected present value of 1 Bangladeshi Taka (BDT) invested for n years for a person aged x . In case of a certain annuity, irrespective of the person being alive or dead, the benefit is paid for n years (to either the person or the nominee). However, in case of deferred annuity, the expected present value depends on the individual's probability to survive along with the rate of return on the investment compounded annually.

Using the formula given above, the annual contribution rate of an individual is computed to be BDT 1235.11, i.e., a daily contribution rate of BDT 6.60.

In order to arrange for universal benefit scheme, this quantum of contribution needs to be financed either by tax or non-tax revenue by the GoB. However, in order to ensure accountability and efficient use of the pension, we recommend a token quantum of contribution (i.e. 10% of the quantum of contribution) by the beneficiaries should be collected annually.

In summary, an individual/government needs to contribute only BDT 6.60 per day for the individuals' entire working life to receive a pension enough to escape the poverty line, certain for his expected lifetime and

thereafter, as long he lives (provided the contributions are invested wisely to generate at least 9.655% returns.

TIER 1

The ‘Tier 1’ scheme is a mandatory scheme where both employer and employees contribute jointly. While the ‘Tier 0’ scheme helps the beneficiary to escape poverty, ‘Tier 1’ would inculcate savings appetite to maintain a decent standard of living post retirement.

The assumptions used in calculating the minimum quantum of contributions are given below:

- The rate of return is taken as the average yield of government security bonds having maturity period of 20 years’, whose quantum is 9.655%¹⁸
- The monthly average income is BDT 16424 in line with the assumptions used in NSIS
- Average annual salary growth is assumed to be as 5% per annum¹⁹ Thus, the quantum of contribution will also increase at the same rate and result in a proportionate increase in annuity
- The median age of Bangladesh as 28 is used in our calculations as an indicator of the age demography in Bangladesh²⁰. The purpose of the median age is to identify an age which is representative of the entire population of Bangladesh, in the process of finding an average contribution amount
- The retirement age of Bangladesh’s workforce is taken to be 60
- Due to the geographical proximity of Bangladesh and India, we have used Indian Assured Lives Mortality (2006-08) Ult.
- We have assumed the annuity is payable in arrears
- Values are in the real terms and not inflation indexed
- The average life expectancy in Bangladesh is taken as 73 years²¹.

Scenario 1

Assuming an individual desire to receive their last drawn annual salary post retirement, the contribution rate required to receive the amount is given in this sub-section.

The formula used to calculate the contribution rate under ‘Tier 1’ pension scheme in Scenario 1 is given below:

$$C = \frac{(v^{32} 32p_{28} M(a_{\overline{13}|} + 13|a_{60}))}{(Ia)_{28:\overline{32}|}}$$

where,

C = Quantum of annual contribution

i = Rate of return received on the investment

$v = 1/(1+i)$

$v^{32} 32p_{28}$ = Discounting factor to estimate the benefit received from age 60 onwards at age 28

M = Last drawn annual salary at retirement

¹⁸ <http://www.worldgovernmentbonds.com/country/bangladesh/>

¹⁹ Consultant’s analysis

²⁰ United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant).

²¹ Data by World Bank

$a_{\overline{13}|}$ = A certain annuity payable annually in arrears for the next 13 years calculated at $i\%$

$13|a_{60}$ = A whole life deferred annuity payable in arrears for an individual aged 60 at $i\%$ rate of return
 $r\%$ - Rate of growth of income per annum

$(Ia)_{\overline{28:32}|}$ = A taka invested for 32 years in arrears per annum starting from age 28 and increasing at the rate of $r\%$ compound p.a. and calculated at $i\%$

Using this formula, we determine that a contribution of 5.99% by the employer and the same by the employee would be required to receive the last drawn salary after retirement for at least 13 years, and thereafter till death.

In summary, contributions of 5.99% annually by the employer and employee each, can provide for a pension to the individual of his last drawn salary, given the contributions increase every year in line with the growth in salary and are invested wisely to generate at least 9.655% rate of return. It would be received for at least 13 years and paid to either the employee, or in case he dies to the legal nominee.

Scenario 2

In an alternative scenario, we can estimate the amount of pension an individual gets assuming a constant given contribution rate and no growth in contribution amounts.

Assuming a 10% contribution rate, the formula used to calculate the contribution rate under 'Tier 1' pension scheme in Scenario 2 is given below:

$$P = \frac{C a_{\overline{28:32}|}}{v^{32} {}_{32}p_{28} (a_{\overline{13}|} + 13|a_{60})}$$

where,

C = Annual contribution amount and is equal to 10% of average annual income BDT 197088

i = Rate of return received on the investment

$v = 1/(1+i)$

P = Annual pension received from the contributions

$a_{\overline{13}|}$ = A certain annuity payable annually in arrears for the next 13 years calculated at $i\%$

$13|a_{60}$ = A whole life deferred annuity payable in arrears for an individual aged 60 at $i\%$ rate of return

$a_{\overline{28:32}|}$ = A temporary annuity payable annually in arrears for a period of 32 years from an individual currently aged 28 at $i\%$ rate of return

${}_{32}p_{28}$ = The probability that a life currently aged 28 will survive for the next 32 years, i.e., till the age of retirement.

$v^{32} {}_{32}p_{28}$ = Discounting factor to estimate expected present value

Using the formula above, we can arrive at the fact that the individual can expect to receive BDT 4,82,014 as a pension for at least 13 years after retirement and thereafter until death. In case of death before the mean expected lifetime, the legal nominee would be receiving it.

In summary, we consider an employee whose annual income is BDT 1,97,088 and contributes 10% of his salary i.e., BDT 19709 towards the pension for a period of 32 years with no growth in contribution amount. In this case, he would receive BDT 4,82,014 annually, i.e., a pension of BDT 40,168 monthly for a period of at least 13 years and thereafter until he dies, provided the contributions are invested wisely to generate at least 9.655% interest.

Scenario 3

In the third scenario, we can estimate the amount of pension an individual gets assuming a constant given contribution rate and contributions increasing every year at a marginal rate.

Assuming a 10% contribution rate and rate of growth of income as 2%, the formula used to calculate the contribution rate under 'Tier 1' pension scheme in Scenario 3 is given below:

$$P = \frac{C(Ia)_{28:\overline{32}|}}{v^{32}32p_{28}(a_{\overline{13}|} + 13|a_{60}))}$$

where,

C = Annual contribution amount and is equal to 10% of average annual income BDT 197088

i = Rate of return received on the investment

$v = 1/(1+i)$

P = Annual pension received from the contributions

$a_{\overline{13}|}$ = A certain annuity payable annually in arrears for the next 13 years calculated at $i\%$

$13|a_{60}$ = A whole life deferred annuity payable in arrears for an individual aged 60 at $i\%$ rate of return

$(Ia)_{28:\overline{32}|}$ = A temporary increasing annuity payable annually in arrears for a period of 32 years from an individual currently aged 28 at $i\%$ rate of return

$32p_{28}$ = The probability that a life currently aged 28 will survive for the next 32 years, i.e., till the age of retirement.

$v^{32}32p_{28}$ = Discounting factor to estimate expected present value

Using the formula above, we can arrive at the fact that the individual can expect to receive BDT 5,60,912 as a pension for at least 13 years after retirement and thereafter until death. In case of death before the mean expected lifetime, the legal nominee would be receiving it.

In summary, we consider an employee whose annual income is BDT 1,97,088 and contributes 10% of his salary i.e., BDT 19709 towards the pension for a period of 32 years with the contribution amount growing progressively at a marginal rate of 2%. In this case, he would receive BDT 5,76,208 i.e., a monthly pension of BDT 48,017 for a period of at least 13 years and thereafter until he dies, provided the contributions are invested wisely to generate at least 9.655% interest.

3.4. Impact on government finances

The total values of the corpus under the different scenarios and tiers are mentioned in Table 16: Corpus values under the different scenarios. In the **Tier 0** of the scheme (under PVP), GoB will be required to finance most of the contributions (i.e. 90% of the BDT 6.6 per day per beneficiary). Given that the working age population is 109,054,000²², the quantum of annual corpus would be **BDT 262 billion** and the annual expense to be incurred by GoB will be **BDT 237 billion**. The **Tier 1** scheme is self-contributory and do not require additional financing by the government. Assuming, all employees of the formal sector contribute to the scheme (i.e. 8.91 million employees), the average annual corpus is mentioned in the table below. In addition, administrative expenses must be accounted for by the GoB. The quantum of contribution can't be estimated for **Tier 2** scheme since it would vary in accordance to savings propensity of individuals.

²² LFS 2016-17

Table 16: Corpus values under the different scenarios

Scheme	Unit	2019-20	2020-21	2021-22	2022-23
Total corpus value in TIER 0	BDT billions	273.95	287.648	302.03	317.131
	USD billions	3.287	3.452	3.624	3.806
Total corpus value in TIER 1 Scenario 1	BDT millions	204.796	218.414	232.883	248.252
	USD billions	2.525	2.692	2.871	3.060
Total corpus value in TIER 1 Scenario 2	BDT billions	170.944	173.63	176.316	179.002
	USD billions	2.107	2.140	2.173	2.206
Total corpus value in TIER 1 Scenario 3	BDT billions	170.944	177.102	179.842	182.582
	USD billions	2.107	2.183	2.220	2.251

3.5. Administrative Costs

The administrative costs under the pension scheme would be required for allowance for the employees and the expenses of related costs such as rent on office premises, desktops, water supply, recruitment and other expenses. Additionally, since the scheme offers individuals options to choose their fund managers and class of asset, a transaction charge becomes important to restrict transactions unless necessary. These charges can serve to cover for the administrative costs. India charges a transaction fee of 0.5% on every transaction made in the pension account. However, the calculation of the administrative costs needs a detailed analysis based on information provided to the consultant.

3.6. Summary table of Pension Scheme

Scheme	Main features	Contribution	Benefit
TIER 0	<ul style="list-style-type: none"> - Universal Scheme covering the entire working age population - State funded with minor contributions from the beneficiaries - Minimum floor social security system - Aims at eradicating poverty by ensuring income above poverty line after retirement 	BDT 6.6 per day (out of which BDT 0.66 is paid by the beneficiary and BDT 5.94 is contributed by GoB)	\$1.90 per day for 13 years or until death (whichever is the later event) after retirement or attaining retirement age (whichever is earlier)
TIER 1	<ul style="list-style-type: none"> - Mandatory contributory scheme by the employers and employees - Covers mostly the formal sector but to be rolled out to the informal sector in a phased manner - Aims at a maintaining a decent standard of living over and above the poverty line 	Scenario 1 - 5.99% by the employer and 5.99% by the employee of their annual salary with progressive increase as salary increases	Last drawn salary at retirement for a period of at least 13 years after retirement
		Scenario 2 - 5% by the employer and 5% by the employee of their annual first year salary with no progressive increases	A pension of BDT 469,218.53 for at least 13 years after retirement
		Scenario 3 - 5% by the employer and 5% by the employee of their annual first year	A pension of BDT 560,911.97 for at least 13 years after retirement

Scheme	Main features	Contribution	Benefit
		salary with marginal increases	
TIER 2	<ul style="list-style-type: none"> - Voluntary and discretionary private savings scheme - All formal and informal sector employees are eligible to invest in individual capacity 	Variable	Depends on the contributions made

4. International good practices related to NSIS and PvP

In this section, we have outlined international good practices and cited few well-acclaimed social security schemes from both developing and developed nations. Since Bangladesh is a lower middle-income country (*source: “World Economic Situation and Prospects 2019” published by United Nations*), we have considered practices followed related to implementation of social security and pension schemes for two countries belonging to similar category in our assessment. Furthermore, considering GoB’s aspiration to graduate Bangladesh to a middle-income nation by 2030 (*based on Budget Speech of Minister of Finance, GoB for FY 2019, 6th and 7th Five Year Plan documents*), we have considered the practices developed/ implemented related to social security and pension schemes by one developed nation in our assessment.

4.1. Rationale behind selection of country comparators

While selecting the countries for our assessment and outline their good practices, we have further identified few macroeconomic parameters against which Bangladesh has performed (been performing) similar to its comparators belonging to developing countries’ category. In addition, we have considered the possible impact of similarity in socio-economic conditions and culture, owing to geographical proximity with Bangladesh, on implementation of the social security schemes.

Considering these qualitative and quantitative indicators, the countries whose good practices related to implementation of social security and pension schemes are outlined in this section are given below:

- **Lower middle-income country/ developing country:** India and Chile
- **Developed country:** Japan

India’s regional proximity to Bangladesh, and similarity in key macroeconomic indicators (such as GNI per capita, change in growth rate of real GDP, trend of inflation rates and population growth rates) render it a suitable case study related to implementation of social security schemes. Amongst other developing countries, Chile has one of the most advanced social security systems, and has implemented universal social protection, which is yet to be achieved by various countries (*source: ILO World Social Protection Report 2017-19*). Chile has pioneered in many innovative schemes, especially in the domain of private pensions and unemployment benefits. Similarly, Japan has been chosen since it has a well-established social security infrastructure amongst the club of developed countries.

Table 17: Practices followed in India related to implementation of social insurance schemes

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
Social Insurance				
Accidental	<p>Employees’ State Insurance Scheme (ESIS) is a social security and health insurance scheme financed by the beneficiaries.</p> <p>The pooled-in fund is supervised by Employees’ State Insurance Corporation (based on the ESI Act 1948), which operates under the Ministry of Labour and Employment. The beneficiaries of ESI receive protection against employment-related disablement.</p> <p>The Workmen’s Compensation Act, 1923 provides for compensation to employees and their dependents in the event of workplace related injuries and accidents (including contracting of occupational diseases) leading to disablement or death.</p> <p>In 2009, the Workmen’s Compensation (Amendment) Bill was introduced, which increased the quantum of benefit and the coverage of employees covered under the Act. For example, the amendment removed the eligibility requirement of having at least 20 employees of in an organization to receive the benefits.²³</p>	<p>Workplace related accidents or diseases contracted from workplace, are covered under ESIS and Workmen’s Compensation Act.</p> <p>Employees with monthly salary not exceeding Indian rupees 21,000 and working in a factory or firm with at least 10 workers are eligible to receive the benefits.</p> <p>Employees covered by schemes/ programmes implemented by private sector companies may choose to opt out from these schemes.</p> <p>Exclusions: Self-employed people, seasonal workers (working less than seven months a year), and agricultural workers are excluded from the scheme.</p>	<p>Insured Person: 0.75% of salary <i>(Employees who receive a daily average salary of ceiling Indian rupees 137 are exempted from payment of the contribution. Their employers, will however, contribute their shares for these employees)</i>²⁴</p> <p>Employer: 3.25% of salary²⁵</p>	<p>Temporary Disability Benefits:</p> <p>90% of the insured employee’s average daily salary is paid for the entire disability period. However, the disability should continue for a period of at least 3 consecutive days.</p> <p><i>Note: Average daily salaries are based on the salaries received by the insured employee in the last six months.</i></p> <p>Permanent Disability Benefits:</p> <p>Quantum of benefits are paid depending on assessed loss of earning capacity of the insured employee. Medical boards assess the loss of earning capacity of the employee.</p> <p>The quantum of daily permanent disability benefit payment capped at 90% of the insured's average daily salaries.²⁶</p>

²³ PRS Legislative Research (accessible via: <https://prsindia.org/billtrack/the-workmens-compensation-amendment-bill-2009-767>)

²⁴ Employers’ State Insurance Corporation (accessible via: <https://www.esic.nic.in/contribution>)

²⁵ Employers’ State Insurance Corporation (accessible via: <https://www.esic.nic.in/contribution>)

²⁶ International Social Security Association (accessible via: <https://www.issa.int/en/country-details?countryId=IN®ionId=ASI&filtered=false>)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
Unemployment	<p>The Rajiv Gandhi Shramik Kalyan Yojana (RGSKY) scheme was introduced in 2005 as part of ESIS, which provide allowance to beneficiaries who have been unemployed due to closure of a factory/ establishment or retrenchment.</p> <p>Atal Bimit Vyakti Kalyan Yojana (ABVKY) scheme has been launched as a part of ESIS, and acts as a welfare measure for employees under Section 2(9) of the ESI Act 1948. This scheme was rolled out on 1 July 2018, and is currently being piloted in various states in India.</p>	<p>The Rajiv Gandhi Shramik Kalyan Yojana (RGSKY): At least three years' contribution is mandatory to get enrolled under the scheme.</p> <p>Employees with monthly salary not exceeding Indian rupees 21,000 and working in a factory or firm with at least 10 workers are eligible to receive the benefits.</p> <p>Exclusions: Self-employed workforce</p> <p>Atal Bimit Vyakti Kalyan Yojana (ABVKY): To be eligible, the insured person should have been in insurable employment for a minimum period of two years. In addition, the insured person should have should have contributed at least 78 days during each of the preceding four contribution periods. In addition, the employee should not get unemployed due to misconduct, superannuation or voluntary retirement.²⁷</p>		<p>The Rajiv Gandhi Shramik Kalyan Yojana (RGSKY): 50% of the beneficiary's average daily salary (in two years preceding unemployment) is paid for a duration of a maximum two years. 25% of the beneficiary's average daily salary for an additional year is also paid.</p> <p>Atal Bimit Vyakti Kalyan Yojana' (ABVKY) provides 25% of the average daily salary (calculated for the previous four contribution periods) for a maximum period of 90 days of unemployment. This benefit can be received only once in the lifetime of the insured person.²⁸</p>
Maternity	The Employees State Insurance Scheme (ESIS) provides maternity benefits in cash to beneficiaries.	The insured individual should be employed for at least 70 working days in two consecutive six-monthly periods before childbirth.		Maternity Benefit is payable to an insured woman in the following cases subject to contributory conditions:

²⁷ Ministry of Labour and Employment (accessible at <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1579082>)

²⁸ Ministry of Labour and Employment (accessible at <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1579082>)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
	<p>This was implemented in 1963 and further amended in 2008, 2016, and 2017. Under this sub-scheme, employers are liable to pay maternity benefits to employees in factories and establishments which are not covered under the Employees' State Insurance Act 1948.²⁹</p>	<p>Exclusions: Self-employed, seasonal workers employed for less than seven months annually, workers in the agricultural sector.³⁰</p>		<ul style="list-style-type: none"> • Confinement- Payable for a period of 12 weeks (84 days) • Miscarriage or Medical Termination of Pregnancy (MTP)- Payable for 26 weeks (182 days) from the date following miscarriage • Sickness arising out of Pregnancy, Confinement, Premature birth- Payable for a period not exceeding one month <p>In the event of the death of the insured woman during confinement leaving behind a child, maternity benefit is payable to her nominee</p> <p>Maternity benefit rate is 100% of average daily salaries³¹</p>
<p>Sickness</p>	<p>Sickness Benefit is under ESIS, and is paid to those who are unable to work for few days on medical grounds</p>	<p>Sickness Benefit: To qualify workers should be employed for a minimum period of 78 days in six-month's period (before getting sick).</p> <p>Employees with monthly salary not exceeding Indian rupees 21,000 and working in a factory (or firm) employing at least 10 workers are eligible to receive the benefits.</p>		<p>Sickness benefit: Benefits are provided periodically through cash disbursement to the insured person. There is a two-day waiting period for the employees.</p> <p>Quantum of sickness benefit is 70% of the average daily salaries and is payable for 91 days during 2 consecutive benefit periods.³²</p> <p>Extended sickness benefit: The quantum of benefit is determined by a Medical Board. This benefit is</p>

²⁹ International Social Security Association (ISSA) (accessible via: <https://www.issa.int/en/country-details?countryId=IN®ionId=ASI&filtered=false>)

³⁰ International Social Security Association (ISSA) (accessible via: <https://www.issa.int/en/country-details?countryId=IN®ionId=ASI&filtered=false>)

³¹ Employers' State Insurance Corporation (accessible via: <https://www.esic.nic.in/permanent-disablement-benefit>)

³² Employers' State Insurance Corporation (accessible via: <https://www.esic.nic.in/sickness-benefits>)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
		<p>Exclusions: Self-employed people seasonal workers (working for less than seven months a year), and agricultural workers.</p> <p>Extended sickness benefit: Employees with age less than 60 years, diagnosed with any of 34 malignant and long-term diseases, and having utilized cash sickness benefits are eligible under the scheme. However, they should be continuously employed for at least two years, and have contributed for at least 156 days.</p> <p>Family planning (Enhanced Sickness Benefits): Employees who have undergone a sterilization procedure are covered under the scheme.</p>		<p>payable for an initial period of 124 days and can be extended to 309 days (in chronic cases).³³</p> <p>Family planning (Enhanced Sickness Benefits): Insured employee eligible to ordinary sickness benefit are paid enhanced sickness benefit at a rate of 100% of average daily salaries. Duration of enhanced sickness benefits is capped at 7 days (in the case of vasectomy) and 14 days (in the case of the tubectomy).</p> <p><i>Note: The count of days is calculated from the date of operation or from the date of admission in the hospital. This period is extendable in event of post-operative complications.</i>³⁴</p>

Administrative features:

The social insurance program in India was conceived through an Act called ESI (Employee State Insurance) Act, 1948. This comprehensive and multi-pronged social security program is administered by an apex body called the Employees' State Insurance Corporation (ESIC). The ESIC comprises members representing various interest groups, including employees, employers, the Central and State Government, representatives of Parliament and medical profession. It is chaired by the Union Minister of Labour and Employment, Government of India.

Registration process: The onus of registration of the employees under the scheme remains with the employer. After submitting the declaration form to the regional office of ESIC, the employer will receive a code along with an Insurance Number for each employee that is subsequently used for employee registration. The payment of contribution can either be made to an authorized bank or through online mechanism by furnishing appropriate details and documents in the required forms.

(source: The ESI Act, 1948)

Pension Scheme

³³ Employers' State Insurance Corporation (accessible via: <https://www.esic.nic.in/extended-sickness-benefit>)

³⁴ Employers' State Insurance Corporation (accessible at <https://www.esic.nic.in/enhanced-sickness-benefits>)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
<p>National Pension Scheme</p>	<p>National Pension Scheme (NPS) is a voluntary defined contribution pension system overseen by Pension Fund Regulatory and Development Authority (PFRDA), set in 2003.</p> <p>The NPS has the following models³⁵:</p> <ul style="list-style-type: none"> • All Citizen Model • Government Sector Model • Corporate Model <p>The NPS has two tiers for each of these models- Tier I and Tier II. ³⁶</p>	<p>All Indian citizens between the age of 18 to 60 are eligible to invest under NPS</p>	<p>All citizen Model:</p> <ul style="list-style-type: none"> • Tier I: Minimum contribution equivalent to Indian rupees 500 while opening of pension account is required. In addition, a minimum contribution of Indian rupees 1,000 should be made annually. • Tier II: Minimum contribution is Indian rupees 1,000 and for each subsequent transaction, the minimum amount is Indian rupees 250. <p>Government Sector Model:</p> <p>Tier I enrollment is mandatory for all government employees, while contribution to Tier II NPS is optional.</p> <p>The quantum of monthly matching contribution (by employer and employee) is 10% of accumulated salary and dearness allowance (DA) paid by the employee.</p> <p>Corporate Model:</p> <p>Three variants of contributions under NPS exist in the corporate model, such as:</p> <ul style="list-style-type: none"> • Equal and matching contributions by employee and employer • Unequal contributions by employee and employer 	<p>NPS offers two types of accounts. The withdrawal rules (or benefits) under the two types of accounts are given below:</p> <ul style="list-style-type: none"> • Tier I: Before the individual reaches the age of 60, only 20% of the contribution can be withdrawn. The balance 80% of benefit can be withdrawn on an annuity basis. • Tier II: The accumulated fund can be withdrawn without any limits. However, unlike in Tier I, fund accumulated under Tier II of NPS does not yield tax benefit to the beneficiary.

³⁵ NSDL e-Governance Infrastructure Limited (accessible at <https://npscra.nsdl.co.in/all-citizens-of-india.php>)

³⁶ Pension Fund Regulatory Authority (PFRDA) (accessible via: <https://www.pfrda.org.in/index1.cshtml?lsid=585>)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
			<ul style="list-style-type: none"> • Contribution from either employee or employer 	
Employers' Provident Fund	The Employers' Provident Funds (EPF) scheme is the primary scheme under the Employees' Provident Funds and Miscellaneous Provisions Act, 1952. ³⁷ The scheme is managed under the aegis of Employees' Provident Fund Organisation (EPFO).	The scheme covers organisations employing at least 20 employees.	<p>Insured Person (employee): Employees pay 12% of their monthly salary. Any contribution exceeding these rates goes towards the Voluntary Provident Fund (VPF).</p> <p><i>(Note: The contribution rate of employees working in establishments employing less than 20 employees/ sick industrial unit/ establishments incurring loss exceeding entire net worth/ establishments in jute, beedi, brick, coir and gum industries, is 10% of their monthly salary)</i></p> <p>Employer: 12% of the monthly salary (of which 8.33% is contributed to the Employees' Pension Scheme) for organizations employing at least 20 employees. 10% of the monthly contribution is paid by employer employing less than 20 employees.³⁸</p>	<p>Employees can withdraw from their provident fund account once they retire (i.e. 58 years of age). However, 50% of the fund can be withdrawn during following events:</p> <ul style="list-style-type: none"> • Marriage (marriage of self, son/daughter, brother/sister) • Education • Purchase of land or house • Home loan repayment • Renovation of house <p>The balance amount, along with interest rate can be withdrawn after retirement.</p>

Administrative features:

Employer's Provident Fund:

These are mandatory social security schemes framed under the provisions of the Employees Provident Fund and Miscellaneous Provisions Act 1952 covering any establishment engaging at least 20 employees. The schemes are administered by Employees Provident Fund Organization (EPFO). There is a Defined Contribution (DC) component in the form of provident fund and a quasi-Defined Benefit (DB) pension under EPS-95.

The EPFO Act is administered by the central board of trustees consisting of a Chairman, a Vice-Chairman, 5 Central government representatives, 15 State government representatives, and 10 representatives of the employer and the employee. Additionally, the EPFO constitutes an executive committee comprising a Chairman, Central

³⁷ Employers Provident Fund India (accessible via: https://www.epfindia.gov.in/site_docs/PDFs/MiscPDFs/ContributionRate.pdf)

³⁸ Employers Provident Fund India (accessible via: https://www.epfindia.gov.in/site_docs/PDFs/MiscPDFs/ContributionRate.pdf)

Social security type and scheme	Programme Context	Coverage and Eligibility criteria	Quantum of contribution	Quantum and Structure of Benefits
<p>PF Commissioner, 2 Central government representatives, and 3 representatives of each from State government, employer and the employee. In addition, the regulative structure of the EPFO is divided into zones, headed by an Additional Central Provident Fund Commissioner.</p>				
<p>The contribution made by the employee goes directly to the EPF Account. Whereas out of the contribution made by the employer, 3.67% goes to the EPF account and 8.33% goes towards pension scheme. All these contributions are then invested by a trust which generates an interest income at a rate which is decided by the Government.</p>				
<p>National Pension Scheme:</p>				
<p>The National Pension System (NPS) is regulated by PFRDA (Pension Fund Regulatory and Development Authority). The PFRDA was created as a regulator for the entire pension sector under PFRDA Act. Disbursement of benefits under NPS is done through personal retirement accounts (PRAs) created for individual members. NPS accumulates savings into subscriber's PRA while he is working and use the accumulations at retirement to procure an annuity from Annuity Service Providers (ASPs) who are empaneled with NPS. NPS architecture consists of NPS Trust which is entrusted with safeguarding subscribers' interests, a Central Recordkeeping Agency (CRA) which maintains the data and records, Point of Presence (POP) and aggregators as collection and distribution arms, competing pension fund managers for generating and maximizing returns on investments of subscribers, custodian to take care of the assets purchased by the Fund managers and Trustee bank to manage the banking operations. Funds are managed by professional Fund Managers from Public & Private sector with proven track record and as per the PFRDA approved investment guidelines.</p>				
<p><i>(Source: Employee's provident fund and miscellaneous provisions Act, 1952; PFRDA Act, 2013)</i></p>				

Table 18: Practices followed in Chile to implement social insurance schemes

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
Social Insurance				
Accidental	Social insurance benefit for workplace related accidents was enacted through Social Insurance Programme Act 1924, which was further amended in 1952.	<p>The scheme covers employee of public and private sector companies, self-employed persons who are contributors to old-age and sickness schemes, household workers, contract and temporary workers, students, apprentices, and trade union representatives.</p> <p>To qualify for the scheme, the intended beneficiaries are assessed based on workplace related injury or occupational disease. Accidents that occur while commuting to and from work are also covered under the scheme. In addition, self-employed professional should contribute the full amount for a year to avail the benefit.³⁹</p>	<p>Regular employees: No contribution is required</p> <p>Employers and self-employed individuals: The basic contribution is 0.95% of the worker’s remuneration, plus an additional differentiated contribution that may reach up to 3.4% of the worker’s contribution.</p> <p><i>(This additional rate depends on prevention measures taken to decrease the likelihood of occurrence of risks.)</i></p> <p>Government: The government only contributes in its capacity as an employer for those who are unable to make contribution under the scheme</p>	<p>Temporary disability benefits: For public-sector employees, 100% of monthly earnings is received as benefit. For private sector employees, the benefit is equivalent to average monthly earnings in the last three months (before occurrence of disability).</p> <p>The duration of benefit can be 52 weeks, which is extendable by a similar period under certain circumstances.</p> <p>Permanent Disability Benefits: For a total disability (i.e. where degree of disability is assessed to be at least 70%), 70% of base salary of the employee is paid as benefit</p> <p><i>(Note: The base salary is defined as the average monthly salary in six months before occurrence of disability).</i></p>
Unemployment	<p>There are several schemes under the unemployment insurance program, which was implemented through Unemployment Insurance Act 2001 (by replacing PROTAC). The key programs are given below:</p> <ul style="list-style-type: none"> • Employment related benefit 	<p>Employment related benefit: The employees should be involuntarily unemployed and should have paid contribution for at least 12 months in two years preceding realization of benefits. In addition, the beneficiary should be registered for employment, and able and willing to work.</p>	<p>a) Employment related benefit:</p> <p>Insured Person: No contribution</p> <p>Employer: No contribution</p> <p>Government: The total cost is financed by the government through the Unified Family Allowances and Unemployment Fund</p>	<p>Employment related benefit: 17,338 pesos per month is paid for the first 90 days. From 91 to 180 days, an amount of 11,560 pesos per month is paid to the beneficiary, and from 181 to 360 days, 8,669 pesos per month is paid to the beneficiary.</p> <p>Unemployment insurance: The quantum of benefits paid is dependent on the account balance and accrued interest rate. The</p>

³⁹ The United States Social Security Administration (SSA) (accessible via: <https://www.ssa.gov/policy/docs/progdesc/ssptw/2016-2017/americas/chile.html>)

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
	<ul style="list-style-type: none"> Unemployment Insurance 	<p>Unemployment Insurance: Employees holding permanent contracts with companies but are unemployed against their will are eligible beneficiaries for the scheme. In addition, the employee should have paid contribution for at least 12 months to realize the benefits.</p> <p>Individuals with fixed-term contracts must have at least six months of contributions of contributions in the last two years before unemployment.</p>	<p>b) Mandatory individual account scheme</p> <p>Insured Person: Employees contribute 0.6% of monthly earnings (employees with permanent contracts pay an additional administrative fee of 0.04% of average monthly salary). Employees with fixed-term employment do not contribute under the scheme. This contribution is deposited to the Individual Savings Account of the employee.</p> <p>Employer: Employers of permanent workers contribute 2.4% of salaries under Unemployment Insurance program. Out of the contribution, 1/3rd of the contribution (or 0.8 percent of salaries) is redirected to finance the Solidarity Severance Account.</p> <p>Government: An annual contribution of amount USD \$10 million is made by the government to the Solidarity Severance Account to</p>	<p>beneficiary can receive 50%, 45%, 40%, 35% and 30% of the average salary of a period of 12 months in the 1st, 2nd, 3rd, 4th and 5th months respectively.</p>
Maternity	Social insurance and mandatory private insurance system	<p>Qualifying conditions for cash sickness, maternity and paternity benefits (public and private systems): Eligible employees should have paid contributions for at least six months, amongst which contributions for at least three months should be made in preceding half-year. For self-employed professionals, contribution for</p>	<p>a) Public System:</p> <p>Employee: 7% of covered earnings (pensioners and beneficiaries of Solidarity Severance Fund are exempted)</p> <p>Self-employed: 7% of declared earnings</p> <p>Employer: None</p> <p>Government: The total cost of maternity benefits (deficit in the national</p>	<p>For public-sector employees, 100% of monthly earnings is paid; for private-sector employees, 100% of the insured's average monthly net earnings is paid. For self-employed persons, 100% of the average monthly declared earnings in the last six months is paid as benefit.</p> <p>The coverage duration of the benefit is six weeks (before childbirth) and 18 weeks (after the expected date of childbirth).⁴⁰ This duration may be</p>

⁴⁰ Law No. 20.5345 published in the Official Gazette of 17 October 2011, which introduced a series of modifications and incorporated new norms to Title II, Book II of the Labour Code

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
Sickness		<p>at least 12 months should be made.</p> <p>The coverage includes both public and private sector workers, self-employed persons, contract workers, pensioners, persons receiving work injury, unemployment, and social assistance benefits.</p>	<p>health system is financed by the government)</p> <p>b) Private System:</p> <p>Insured Person: Depending on the health plan, 7% of gross earnings is contributed by the beneficiary.</p> <p>Self-employed: At least 7% of declared earnings, depending on the health plan.</p> <p>Employer: None</p> <p>Government: The cost of sickness benefits maybe partially financed by the government.</p>	<p>extended in cases of premature or multiple births.</p> <p>Maternity benefit is also paid for 12 months for the adoption of a child younger than 6 months.</p> <p>For public sector employees, the benefit amount is equivalent to 100% of the insured's net earnings (before contracting the disease). For private sector employees, 100% of the insured's average monthly net earnings in the last three months (before contracting the disease) is paid as benefit. For self-employed persons, 100% of the insured's average monthly declared earnings in the last six months is paid as benefit.</p> <p>The sickness benefit is paid from the first day of employment (if the duration of sick-leave period is at least 11 days) and from the fourth day (if the duration of sick-leave is less than 11 days). The employer pays the benefit for the first three days only.</p>

In Chile, under the social benefits, the sickness and maternity come under the ambit of health insurance, wherein an employee is obligated to contribute to public health insurance (National Health Fund) or a private health insurance (ISAPRES) subject to a cap of 2,200,000 Pesos per month. Anything more than this amount is considered supplementary and is deducted from the employee's net salary.

Additionally, the employers are mandated to contribute 3.35% of the worker's remuneration (out of which, 2.40% goes towards unemployment and 0.95% goes towards occupational accident) and the employees contributes an amount equivalent to 17.6% of their respective salary (out of which 10% goes towards pension, 0.6% goes towards unemployment and 7% goes towards health insurance).

Administrative features:

- **Health care system (covering sickness and maternity):**

The health care system in Chile incorporates both the public and private medical services. The employees are mandated by legislation to participate in either of the system. The public healthcare system is financed through FONASA (National Health Fund or Fondo Nacional de Salud) and delivered by the National Health Services System (NHSS) as well as the municipal system for primary care. Both of these bodies are presided by the Ministry of Health. The financing of the NHSS and the municipal bodies is done by FONASA. In case of NHSS, the quantum of grants received depends on the type of disease. For diagnosis of most frequent diseases, the SNSS receives the funding for each diagnosis, however, for other types of diseases, it receives the funding as payment-for-services. On the other hand, the municipal

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
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system receives their fund based on assessment of parameters such as count of persons registered, their socio-economic characteristics, the volume of services delivered etc.

The private health care system in turn are handled through ISAPRES ((Instituciones de Salud Previsionales), an alternative to FONASA. It is applicable for those citizens who decide to be insured by the private sector instead of FONASA. The ISAPRES work through a network of private health care providers and facilities that are contractually linked to them.

- **Employment Injury:**

The employment injury insurance in Chile is governed by Law No. 16.7444 of 23 January 1968 on employment injury and occupational diseases as well as Law No. 20.255 of 17 March 2008 on social insurance reform. The administrative structure comprises of one public entity and three private not-for-profit entities. All four entities are legally mandated to develop and implement programmes to prevent the work-related hazards, and to provide health prevention services and treatment of occupational injuries and professional diseases.

- **Unemployment:**

The unemployment insurance in Chile is a mixed system which is financed by all three social actors (i.e., government, employers and the employees). The system is based on two principle funding mechanism: individual savings accounts for each worker financed by contributions from worker and employer in case of open-ended contracts and only by employers in the case of workers with atypical contracts. The other aspect is the solidarity fund financed by the employers and the government. The unemployed workers can only receive payments from the solidarity fund if their own savings are insufficient to cover their period of employment.

In the case of permanent employment, the contribution by the employer amounts to a total of 2.4% of the total remuneration of the employee, out of which 1.6% goes to the individual savings account and the rest 0.8% goes to the Solidarity Severance Fund. The employees in turn contributes 0.6% of their remuneration, from which the entire amount goes towards the individual savings account. Additionally, the government contributes a fixed amount to the Solidarity Severance Fund (USD 10 million annually).

The overall system is managed by a private entity chosen by the government through auctioning process. The entity quoting the lowest administrative fees for 10 years is given the responsibility to manage the funds. Through accepting the responsibility, the entity caters to six main objectives such as collect contributions, credit individual savings accounts, invest the resources in the financial market, verify the eligibility criteria, pay benefits, and pursue the debtors.

(source: ILO reports; social-security.org; World Bank discussion paper no. 0612; www.ssa.gov)

Pension Scheme

The Chilean Pension System	The pension system in Chile is basically divided into two bases: For those who have been enrolled into the system before 1983 (i.e. the year of first pension reform in Chile) and for those who are enrolled after 1983.	Social insurance: Salary earners, salaried employees, and self-employed professionals who earn less than three times the legal monthly minimum salary, those who have made their social insurance contributions before January 1, 1983 and opted to remain under the	a) Social Insurance: Insured person: Salary earners contribute 18.84% of covered salaries; salaried employees contribute 20% to 30% of earnings, depending on the type of occupation. Self-employed: 18.84% of declared earnings Employer: None	Social Insurance: The monthly benefit is 50% of the insured's base salary. In addition, 1% of the base salary over 50 week's period is paid.
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Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
		<p>social insurance system are eligible for the benefit</p> <p><i>(Note: Until December 2017, the legal monthly minimum salary is 270,000 Pesos, which was revised to 276,000 pesos since January 2018).</i></p> <p>Reformed pension system: For employees who have entered the labor force after December 31, 1982, and certain self-employed professionals are eligible for the scheme. This system underwent a major reform in 2008, and since then is based on three pillars:</p> <ul style="list-style-type: none"> • Compulsory Individual Capitalization • Voluntary Pension Savings • Solidarity Pension System 	<p>Government: The cost of administration is borne by the government</p> <p>b) Reformed pension system</p> <p>Insured person: 10% of annual covered earnings (for old age), 1.41% of annual covered earnings (for disability survivors) and 1.23% of annual covered earnings (as administrative fees) are required to be contributed.</p> <p>Self-employed: 10% of annual covered earnings (for old age), 1.41% of annual covered earnings (for disability survivors) and 1.23% of annual covered earnings (as administrative fees) are required to be contributed.</p> <p>Employer: 1% (or 2%, depending on the type of industry) of covered payroll for employees working under arduous conditions (for old age) should be contributed. In addition, 1.41% of the payroll should be contributed for disability allowance.</p> <p>Government: The government finances the guaranteed minimum old-age and disability pensions, old-age solidarity top-up benefit (APS Vejez), and disability solidarity top-up benefit (APS Invalidez).</p>	<p>Reformed pension system</p> <p>The value of the pension depends on the insured's contributions plus accrued interest. Upon retirement, the accumulated capital can be used to buy an immediate life annuity, temporary income with a deferred life annuity, programmed withdrawals, or an immediate life annuity with programmed withdrawals.</p> <p>The adults (over 65 years of age) or disabled who do not have sufficient contributions in their accounts are entitled to a basic solidarity pension which is equivalent to US \$160 per month (adjusted to inflation).</p>

Administrative features:

The Chilean pension system underwent a major reform in 2008. Under the reformed state, the system rests on three pillars: (1) Compulsory individual capitalization (2) Voluntary pension savings, and (3) Solidarity Pension System. The individual capitalization system is managed by private not-for-profit entities, known as Pension Fund Administrators (Administradoras de Fondos de Pensiones, AFP). The social security institute (Instituto de Prevision Social, IPS) manages the previous assessment scheme and the new solidarity pension system. The pension supervisor, which reports to the Ministry of Labour and Social Security, is responsible for the regulation, supervision and control of the pension system.

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of contribution	Quantum and Structure of Benefits
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(source: ILO reports; social-security.org; World Bank discussion paper no. 0612; ssa.gov)

Table 19: Practices followed in Japan to implement social insurance schemes

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of Contribution	Quantum and Structure of Benefits
Social Insurance				
Accidental	<p>Workers' Accident compensation insurance is a social insurance system based on the Workmen's Accident Compensation Law 1947. It aims to provide benefits to workers in the event of illness, injury, disability or death caused by work or while commuting to or from work.⁴¹</p>	<p>Employees who have suffered from a workplace related injury or having contracted disease from workplace are eligible for the scheme. All employees in formal sector are mandatorily covered under the scheme. Coverage is voluntary for those employed in agricultural, forestry, and fishery establishments employing less than five regular employees.</p> <p>Self-employed professionals can enroll themselves voluntarily.</p> <p>Government employees are covered by a different compensation system.</p>	<p>Insured Person: None</p> <p>Self-employed: 0.3% to 5.2% of the basic daily remuneration multiplied by 365. Here, the basic daily benefit is the insured's average salaries in the last three months prior to the occurrence of the injury or disease.</p> <p>Employer: 0.25% to 8.8% of salary (depending on type of business) (revised on April 2015).⁴²</p> <p>Government: Deficit financing to the contribution (as required)</p>	<p>Temporary disability benefits: In the temporary absence from work benefit, 60% of the basic daily benefit in addition to a disability supplement (i.e. 20% of the basic daily benefit) is paid after a three-day waiting period until recovery. The basic daily benefit is the insured's average daily salaries in the three months prior to occurrence of accident.</p> <p>After 18 months of absence from work, minimum and maximum benefits apply. Minimum benefits range from 3,920 Yen to 7,009 Yen, depending on the beneficiary's age. The maximum benefit ranges from 13,264 Yen to 25,219 Yen, which also depends on the beneficiary's age.</p> <p>Benefit adjustment: Benefits are automatically adjusted on a quarterly basis if salaries change by more than 10% from the previous quarter.⁴³</p> <p>Permanent disability benefits: For more severe disabilities, permanent</p>

⁴¹ The United States Social Security Administration (SSA), (accessible via: <https://www.ssa.gov/policy/docs/progdsc/ssptw/2016-2017/asia/japan.pdf>)

⁴² Japan External Trade Organisation (JETRO) (accessible via: <https://www.jetro.go.jp/usa/japans-social-security-system.html>)

⁴³ International Social Security Association (ISSA) (accessible via: <https://www.issa.int/en/country-details?countryId=JP®ionId=ASI&filtered=false>)

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of Contribution	Quantum and Structure of Benefits
				<p>disability benefits are provided. Quantum of benefit varies depending on assessed degree of disability.</p> <p>Workers' medical benefits and survivor benefits for dependents also exist to safeguard against workplace accidents.</p>
Unemployment	<p>Employment Insurance is a social insurance system based on the Employment Insurance Act 1974.</p>	<p>All employees are covered under the scheme. To receive unemployment benefits, the beneficiary must have paid contribution for at least 12 months in 24 months prior to being unemployed.</p> <p>Furthermore, the individual must not be unemployed due to voluntary leaving, misconduct and should be willing and able to work.</p> <p>This program excludes employees who have less than 20 scheduled weekly working hours and self-employed professionals.</p> <p>Coverage is voluntary for those employed in agricultural, forestry and fishery establishments with less than five regular employees.</p>	<p>Insured Person: 0.3% of monthly salary</p> <p>Employer: 0.6% of salary</p> <p>Government: 2.5% of the cost of unemployment benefits, and 1.25% of the of the child care leave benefit, nursing care leave benefit</p>	<p>Unemployment benefit: The quantum of benefit ranges from 50% to 80% of the insured's average daily salary (which depends on the average salary for last six months and age of the beneficiary).</p> <p>The benefit is paid after a seven-day waiting period for 90 to 330 days depending on age, reasons for unemployment and length of coverage.⁴⁴</p> <p>Other than unemployment benefits there are other schemes under this system including unemployment benefit for older workers, employment continuation benefit for older workers, child care leave benefit, and nursing care benefits</p>
Maternity	Maternity and sickness benefits are provided as part of	National Health Insurance:	<ul style="list-style-type: none"> National Health Insurance: 	National Health Insurance: Maternity benefits provided varies by

⁴⁴ International Social Security Association (ISSA) (accessible via: <https://www.issa.int/en/country-details?countryId=JP®ionId=ASI&filtered=false>)

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of Contribution	Quantum and Structure of Benefits
	<p>Japan's National Health Insurance and Employees' Health Insurance programmes. These are under the purview of the Employees Health Insurance Act 1922 (amendment in 2015) and the National Health Insurance Act, 1938.</p>	<p>National Health Insurance covers the self-employed and unemployed. Residents till the age of 75 and those who are not covered under the Employees' Health Insurance are eligible beneficiaries.</p> <p>Exclusions: Persons with disabilities, aged 65 to 74, and covered under other health and medical care program for older people.</p> <p>Employees' Health Insurance: Employees' health insurance covers those who are public servants or work in companies. These insurance schemes are further subclassified into four types: Japan Health Insurance Association (JHIA), Society Managed Health Insurance (SMHI), Mutual Aid Association, and Seamen's Insurance.</p> <p>Each of the category is either managed by a society or by an association.</p> <p>There is no minimum qualifying period for receipt of maternity allowances and grants provided under this program.</p> <p>Coverage is voluntary for private sector employees where the organization has less than five regular employees agricultural, forestry or fishery workers.</p> <p>Exclusions: Self-employed persons.</p>	<p>Insured Person: Contribution varies depending on insurer</p> <p>Employer: None</p> <p>Government: 50% of care is financed by government.</p> <ul style="list-style-type: none"> Employees' Health Insurance: <p>Insured Person: 5% of monthly salary according to 50 salary classes</p> <p>Employer: 5% of monthly salary according to 50 salary classes</p> <p>Government: 16.4% of benefit costs, 16.4% of the cost of healthcare program for older people, all administrative costs of the association-managed program and partial administrative costs of the society-managed program.</p>	<p>amount depending on municipality and insurer.</p> <p>Employees' Health Insurance:</p> <ol style="list-style-type: none"> 1) Maternity Allowance: 66.67% of average daily basic salary over the last 12 months is paid. The benefit is paid for a period of 42 days before and 56 days after excepted date of childbirth. 2) Childcare allowance: A lumpsum of 420,000 yen is paid to the insured or the dependent of an insured person.
Sickness				<p>National Health Insurance: Under this scheme, in-cash and reimbursable medical benefits are provided to the beneficiaries.</p> <p>Cash benefits: Each insurer may provide maternity allowances, child-care allowances, and funeral grants. Benefit types and quantum vary by municipalities.</p> <p>Medical benefits: Examples include medical treatment, surgery, hospitalization, and medicine.</p> <p>There is no limit to duration of benefit.</p> <p>Employees' Health Insurance: Under this</p>

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of Contribution	Quantum and Structure of Benefits
				<p>scheme, in-cash and reimbursable medical benefits are provided to the beneficiaries.</p> <p>Sickness and injury allowance (cash benefit): The benefit is paid after a three-day waiting period for up to 18 months. Depending on salary class, 66.67% of the insured's average daily basic salary (in 12 months preceding the incidence) is paid. If the insured receives salaries, benefits are suspended or partially reduced.</p> <p>Medical benefits: Examples include medical treatment, surgery, hospitalization, and medicine.⁴⁵</p> <p>Dependents' Medical benefits are provided under employees' health insurance.</p>
<p>Administrative features:</p> <p>The overall social security in Japan is managed according to Employees' Health Insurance, 1922; National Health Insurance 1938; Medical Systems for the elderly, 1982; Workmen's accident and compensation insurance, 1947; Employment Insurance, 1974; Employees' pension insurance, 1954 and National Pension Act, 1959.</p> <p>All the focus areas of the assignment (sickness, maternity, accidental and unemployment along with pension scheme) comes under the ambit of the Ministry of Health, Labour and Welfare, who holds jurisdiction over the entire social security systems. The Ministry sets national standards and promotes projects deemed necessary to be implemented from a national perspective. The Cabinet Office is in charge of planning the governmental basic policy plans related to social security. The local governments such as prefectures and notably municipalities (cities, towns and villages) execute and implement the social security services.</p> <p><i>(Source: Social security report 2014 by National Institute of Population and Social Security Research; ILO reports; social-security.org; ssa.gov)</i></p>				

⁴⁵ International Social Security Association (accessible via: <https://www.issa.int/en/country-details?countryId=JP®ionId=ASI&filtered=false>)

Product Type	Programme Context	Coverage and Eligibility Criteria	Quantum of Contribution	Quantum and Structure of Benefits
Pension scheme⁴⁶				
National Pension Programme	National Pension Programme and Employees' Pension Insurance Programmes	<p>National pension programme: Residents of Japan aged 20 to 59.</p> <p>Coverage is voluntary for residents aged 60 to 64 (age 69 in special cases) and for citizens of Japan aged 20 to 64 (age 69 in special cases) residing abroad.</p> <p>Employees' pension insurance: Employed persons younger than age 70 in covered firms.</p> <p>Voluntary coverage for employed persons aged 70 or older under certain conditions.</p> <p>Exclusions: Certain part-time employees</p>	<p>a) National Pension Programme:</p> <p>Insured Person: 16,340 yen a month (April 2018 to March 2019)</p> <p>Self-employed Person: 16,410 yen a month</p> <p>Employer: None</p> <p>Government: 50% cost of benefits and total cost of administration</p> <p>b) Employees' Pensions Programme:</p> <p>Insured Person: 9.15% of monthly salary based on 31 salary classes.</p> <p>Employer: 9.15% of monthly salary based on 31 salary classes.</p> <p>Government: The total administrative cost</p>	<p>National Pension Programme: 779,300 yen annually is paid as benefit to beneficiary.</p> <p>Employees' Pension Insurance: The pension is computed based on insured's average monthly salary over the full career. The pension is paid every two months after retirement.</p>
<p>Administrative features:</p> <p>The overall social security in Japan is managed according to Employees' Health Insurance, 1922; National Health Insurance 1938; Medical Systems for the elderly, 1982; Workmen's accident and compensation insurance, 1947; Employment Insurance, 1974; Employees' pension insurance, 1954 and National Pension Act, 1959.</p> <p>All the focus areas of the assignment (sickness, maternity, accidental and unemployment along with pension scheme) comes under the ambit of the Ministry of Health, Labour and Welfare, who holds jurisdiction over the entire social security systems. The Ministry sets national standards and promotes projects deemed necessary to be implemented from a national perspective. The Cabinet Office is in charge of planning the governmental basic policy plans related to social security. The local governments such as prefectures and notably municipalities (cities, towns and villages) execute and implement the social security services.</p> <p><i>(Source: Social security report 2014 by National Institute of Population and Social Security Research; ILO reports; social-security.org; ssa.gov)</i></p>				

⁴⁶ International Social Security Association (ISSA) (accessible via: <https://www.issa.int/en/country-details?countryId=JP®ionId=ASI&filtered=false>)

5. Overarching institutional and governance structure

This section outlines the regulatory, institutional structure and the architecture needed to operationalize the fund to implement NSIS and PVP. While conducting an assessment based on international good practices and during consultations with stakeholders (during inception phase of the engagement), we have analysed the key requirements in implementing and managing the schemes. While this section can provide key pointers to implement the social protection schemes in the country, proper implementation of the schemes requires detailed study and a concerted effort by various stakeholders that can be assessed in later course of the engagement.

5.1. Regulatory framework for implementation of NSIS and PVP

In this sub-section, we have outlined the basic structure of a new regulation that needs to be in place for the implementation of NSIS and PVP. Since we are envisaging a scenario wherein the employer is also required to contribute for employees in the formal sector, it would not be possible to implement such provisions in the absence of enabling regulatory provisions. The Table below outlines the basic structure of regulation that needs to be in place before NSIS and PVP is implemented. While the exact details of what the Act should contain is beyond the purview of this assignment, it gives the broad themes and the key salient features that needs to be kept in perspective while designing the new regulation.

Sl No	Provisions	Remarks
1.	Name of the Act	A suitable name for the implementation of NSIS and PVP will have to be chosen
2.	Geographical coverage and applicability	<p>It has to be decided whether the provisions of the Act shall extend to the entire country of Bangladesh or whether separate exclusions need to be considered</p> <p>The Act needs to mention the kind of sectors and industries wherein the provisions of the Act would be made applicable.</p> <p>Also, it can specify a threshold in terms of number of employees working in an establishment beyond which the provisions of the Act would be automatically made applicable</p> <p>There should also be an enabling provision vide which Govt of Bangladesh can from a date that it chooses to prescribe consider extending the provision of the Act to such establishment or classes of establishment as may be notified from time to time</p> <p>There should also be provision of voluntary coverage under the Act for employers having less than the threshold number of employees</p>
3.	Key definitions	All key definitions need to be defined. These would include all such items like “employer”, employee. Salary, pension, maternity, sickness, accident, disability, factory, exemptions etc.
4.	Central Board of Trustees (CBT)	<p>The Act should specify the creation of a Board of Trustees and its composition. There should be equal representation from employer and employee on the Central Board</p> <p>In addition, the Board should be headed by an officer of BCS having Secretary level status in the capacity of Chairman</p> <p>The Board should have a CEO having an appropriate designation (e.g. Chief Commissioner of Social Security) having adequate quasi-judicial powers who should be the Secretary of the CBT</p> <p>The terms and conditions subject to which a member of the CBT may be appointed and the time, place and procedure of the meetings of the Central board shall be such as may be provided for in the different schemes outlined in the Act</p>
5.	Appointment of officers	The Act should specify the appointment of officers for the implementation of NSIS and PVP by the CBT

Sl No	Provisions	Remarks
		The method of recruitment, salary and allowances, discipline and other conditions of service should be specified by the CBT
6.	Provision for various schemes	<p>The Act should specify the following Schemes</p> <ul style="list-style-type: none"> • Unemployment • Sickness • Maternity • Accident <p>For pension the following schemes should be covered</p> <ul style="list-style-type: none"> • Universal basic pension (Tier-0) • Contribution by both employer and employee (Tier-1) • Voluntary contribution by employee (Tier-2)
7.	Creation of fund for various schemes	<p>The Act should specify the creation of fund for each of the schemes that is being implemented. Each of these funds will be administered by the CBT.</p> <p>Accounting and record keeping of these funds will be done independently and a consolidated report regarding the status of the fund should be prepared within 6 months of close of financial year and presented before the Board by the CEO for approval.</p>
8.	Additional schemes	The Act should give the power to Govt of Bangladesh to come out with any additional scheme that it desires
9.	Contribution by employer, employee and Government	The Act should specify under the schemes the contribution rates for the employer, employee and the government for each of the various schemes (except that of tier 2 PVP since it is voluntary)
10.	Determination of money due from employer	<p>The Act should have an enabling provision to decide on the applicability of this Act to an establishment and determine the amount due from any employer under any provision of this Act and that of the Scheme</p> <p>It should specify the powers of the officer conducting any such inquiry regarding matters like</p> <ul style="list-style-type: none"> • Enforcing the attendance of any person or examining him on oath; • Requiring the discovery and production of documents; • Receiving evidence on affidavit; • Issuing commissions for the examination of witnesses
11.	Mode of recovery	<p>The Act should specify various modes of recovery through which the amount determined as “due” from the employer can be recovered.</p> <p>This should include (i) attachment of bank account of the employer (ii) garnishee proceedings, (iii) attachment and sale of movable and immovable properties (iv) detention and arrest</p>
12.	Priority of dues	The Act should specify how dues from an employer under this Act will be recovered when the employer has also defaulted in paying his other dues (e.g taxes, loans taken from banks) and in such a scenario how recoveries need to be prioritized across multiple Acts
13.	Review and appeal	<p>The Act should have provisions for review and appeal</p> <p>There should be an Appellate body having such staff, officers and Presiding Officer as would be mentioned in the Act</p> <p>The salary and allowances payable to, and the other terms and conditions of service of all staff and officers working in the Tribunal shall be as per the provisions of the Act</p>

Sl No	Provisions	Remarks
14.	Procedure of the Tribunal	All operating procedures of the Tribunal regarding admission of cases for hearing, ex- parte hearing, passing of orders, deposition of money for admission of cases to be taken up for hearing, appeal of order passed by the Tribunal and all such matters should be mentioned in the Act.
15.	Provision of penalties	The Act should have provisions for imposition of penalties on any employer who wants to avoid any payment to be made as per the provisions of the Act.
16.	Exclusion from the purview of operation	There could be a scenario where the Government of Bangladesh may consider that the provision of this Act will not be applicable for such establishments or classes of establishments as may be notified from time to time. Hence a provision to that effect will be required
17.	Liability in case of transfer of an establishment from one employer to another	Where an employer in relation to an establishment, transfers that establishment in whole or in part, by sale, gift, lease or licence or in any other manner whatsoever, the employer and the person to whom the establishment is so transferred shall jointly and severally be liable to pay the contribution and other sums due from the employer under any provision of this Act. An enabling provision to that effect will be necessary
18.	Power to give directions	The Act needs to have a provision vide which Govt of Bangladesh may, from time to time, give such directions to the CBT as it may think fit for the efficient administration of this Act which will require the CBT to comply with such direction.
19.	Power to makes Rules	Govt of Bangladesh will also have complete powers to frame official rules as may be notified from time to time to implement the various provisions of the Act and the schemes
20.	Power to remove difficulties	If any difficulty arises in giving effect to the provisions of this Act, , the Government of Bangladesh may, , make such provisions, not inconsistent with the provisions of this Act, as appear to it to be necessary or expedient for the removal of the difficulty

Corresponding to this Act, Govt of Bangladesh will have to make “Rules” for implementing the various provisions of NSIS and PVP. Actual operationalization will start once the Act and the Rules are both in place. It may be noted that specific rules need to be drafted for each of the different schemes as mentioned in Sl No 6 above.

5.2. Proposed institutional features for scheme implementation

In line with the regulatory framework that we have proposed, we would also like to outline the basic administrative requirements that needs to be in place in order to operationalize the provisions of the Act. Our proposed structure to implement NSIS and PVP is based on the premise that the contributions received from various stakeholders will be consolidated in a pooled fund. This section focuses on the operational aspect of such pooled fund.

Before operationalizing the funds, it is important for the GoB to create safeguard mechanisms and ensure that:

- The interests of the beneficiaries of the schemes are maintained
- Employers and employees comply with the Act and the Rules

Thus, it becomes essential to **establish an institutional structure to manage the operational aspects** of the fund. The key features of such an administrative body is highlighted in **Table 20**.

Table 20: Key features of the administrative body

Objective	The objective of the institution may be formulated considering the protection of beneficiary’s interests and effective regulation of the pooled funds to implement NSIS and PVP
Composition	The institution should be headed by

- A senior level functionary having the required experience and expertise in insurance and pension domain. He should be vested with quasi judicial powers to discharge his duties in an effective manner.
- The institutional should also have enough officers at junior and middle management level who would be tasked with effective implementation of the various scheme provisions. All officers should have adequate quasi-judicial powers to conduct hearings, determine due and enforce recovery of dues from defaulting employers
- In addition, there will be a requirement to have assistants and inspectors to assist the officers in the implementation process.

However, in order to determine the duties, powers, and composition of the administrative body, a detailed study can be undertaken at a later phase.

Key Policies

The institution needs to come up with key policies and procedures that can help to operationalize the functioning of the institution. The principal ones would include the following:

- Operational policies and Standard operating procedures for implementation of all scheme provisions
- Accounting and financial management of all scheme provisions
- Delegation of financial powers
- Service delivery processes and procedures for all schemes
- Investment policies
- Enforcement and recovery of dues from defaulting establishments
- HR Policy (including recruitment, remuneration, performance management and grievances)
- Procurement policy
- Whistleblower policy
- IT policy, systems and processes
- Policies on internal controls, audits and oversight mechanisms

Internal Committees

In addition to the key managerial personnel, the institution needs to consider setting up of the following committees to provide necessary assistance in policy making and implementation

- Medical Council:** From our assessment of international good practices, it is suggested that a medical council should be established which will advise on matters related to the administration of the medical benefits, certify additional grants/ extension of benefits (if any) and other related matters.
- Research and Awareness Council:** To increase the count of beneficiaries under the schemes and periodically revise the structure of the schemes considering the emerging needs of beneficiaries, it is essential to establish the council.
- Audit Committee:** To protect the beneficiary's interest, the Audit and Compliance reports prepared by various fund managers might need review by the audit committee.
- IT Committee/ department:** For the scheme to be implemented on a wide scale and to streamline the process (from opening a unique account to receiving the claim), the role of an IT department remains vital.

- e) **Investment committee:** There should be an investment committee that should recommend the investment to be made in line with approved investment policies

In order to implement the schemes and manage the fund, it is important to establish the key players and stakeholders, which is outlined in **Table 21**.

Table 21: Key stakeholders

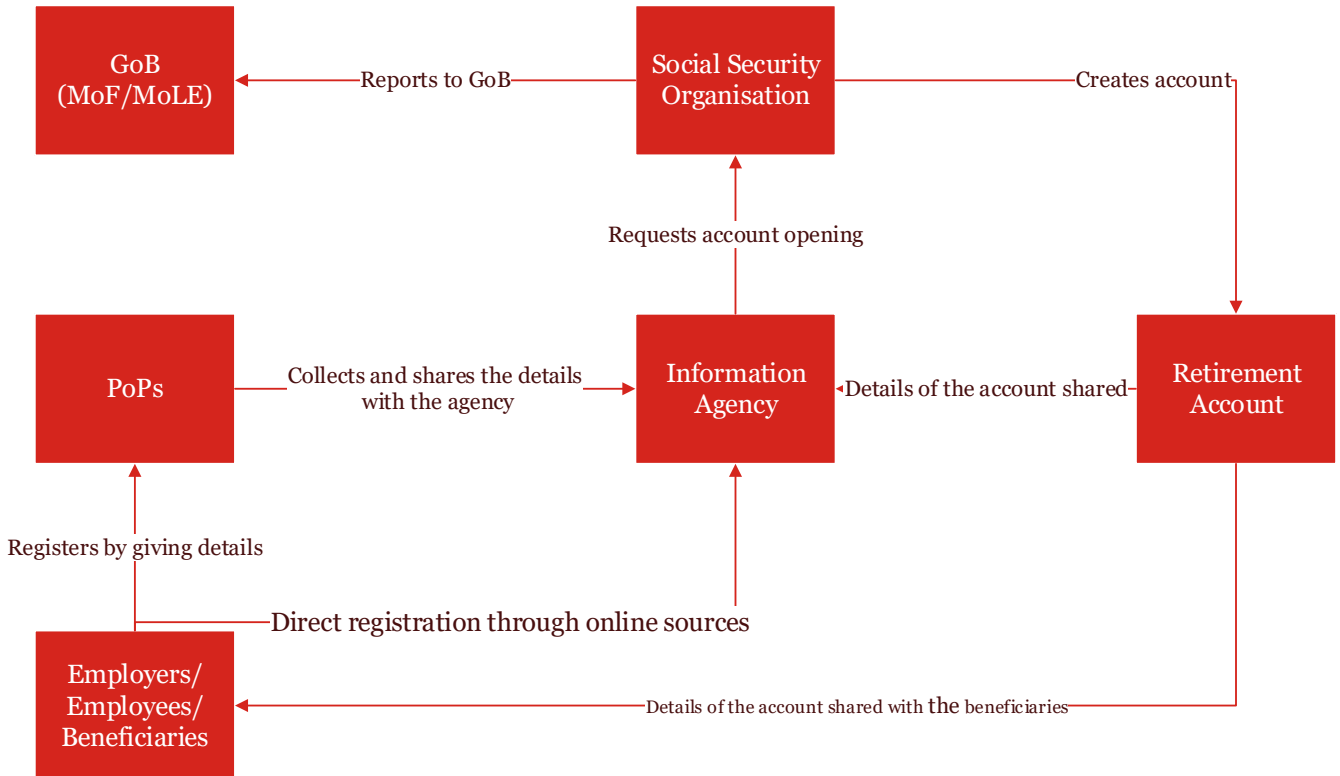
Stakeholders	Roles
Central Record Keeping Agency	We envisage the support of an agency like Central record Keeping Agency (CRA) that will help to store the records of the subscribers in a digitized manner. They will be responsible for keeping and maintaining the records of the beneficiaries. They may also act as an intermediate between the administrative body and the Point of Presence (PoP).
Point of Presence (PoP)	A point of presence is described as a registered financial institution that will be responsible for collecting the beneficiary's data and share it with the CRA/ institution for further processing. This could include public sector banks, private sector banks, microfinance institutions and other financial institutions (such as non-banking financial institutions).
Fund Managers	The fund managers will be responsible for managing the investment of the entire corpus of the centralized fund. They are responsible for investing the funds in specific asset classes to gain a good return on assets (ROI). A list of fund managers should be shared with beneficiaries; the beneficiaries can choose their fund managers accordingly.
Trustee Bank	This may be a banking institution where in the entire corpus of the fund is managed by the administrative body.

5.3. Proposed architecture

In this section, we have outlined the process of registration of an employee, which is the first step to become an eligible beneficiary of the schemes. In addition, we have presented an illustration of the process of claims and the fund flow (from employees to fund managers) which can serve as a guideline for creation of the functional requirement specifications of the IT system to manage the fund. However, these process flows can be modified based on emerging need of the stakeholders in subsequent phase. In all these processes, the Government of Bangladesh (GoB) can supervise the flow through its ministries such as the Ministry of Finance or Labour and Employment.

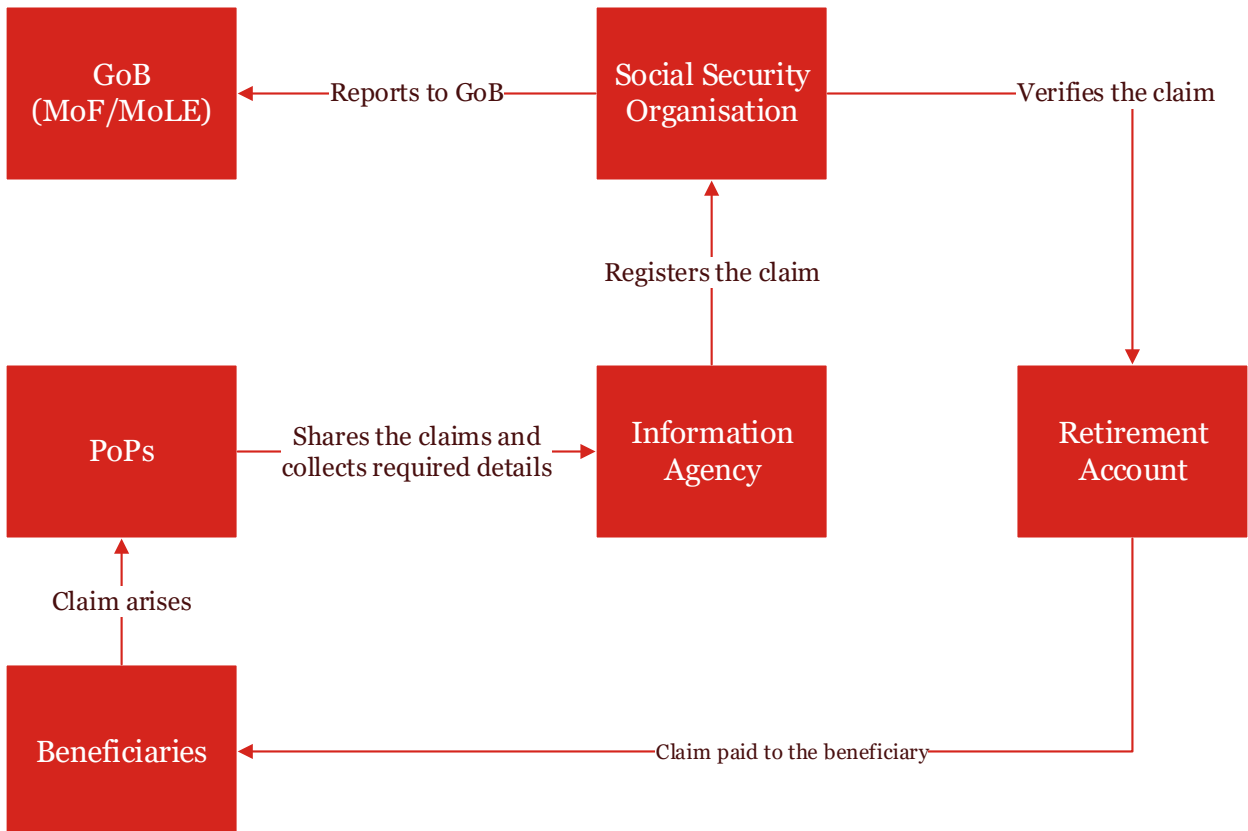
- **Process of registration:** The beneficiary may register themselves in the NSIS and PVP scheme through a point of presence (PoP) or directly through online sources. The PoP will then collect and verify their necessary details and share the information with the information agency. The agency will collate and maintain records of the beneficiaries in a centralized database and requests the Social Security Organisation (SSO) to create an account for the beneficiary to track their contributions. The SSO creates the Retirement Account and shares the details with the Information Agency and the beneficiary. The detailed process mapping of the same is captured in **Figure 7**.

Figure 7: Proposed registration process



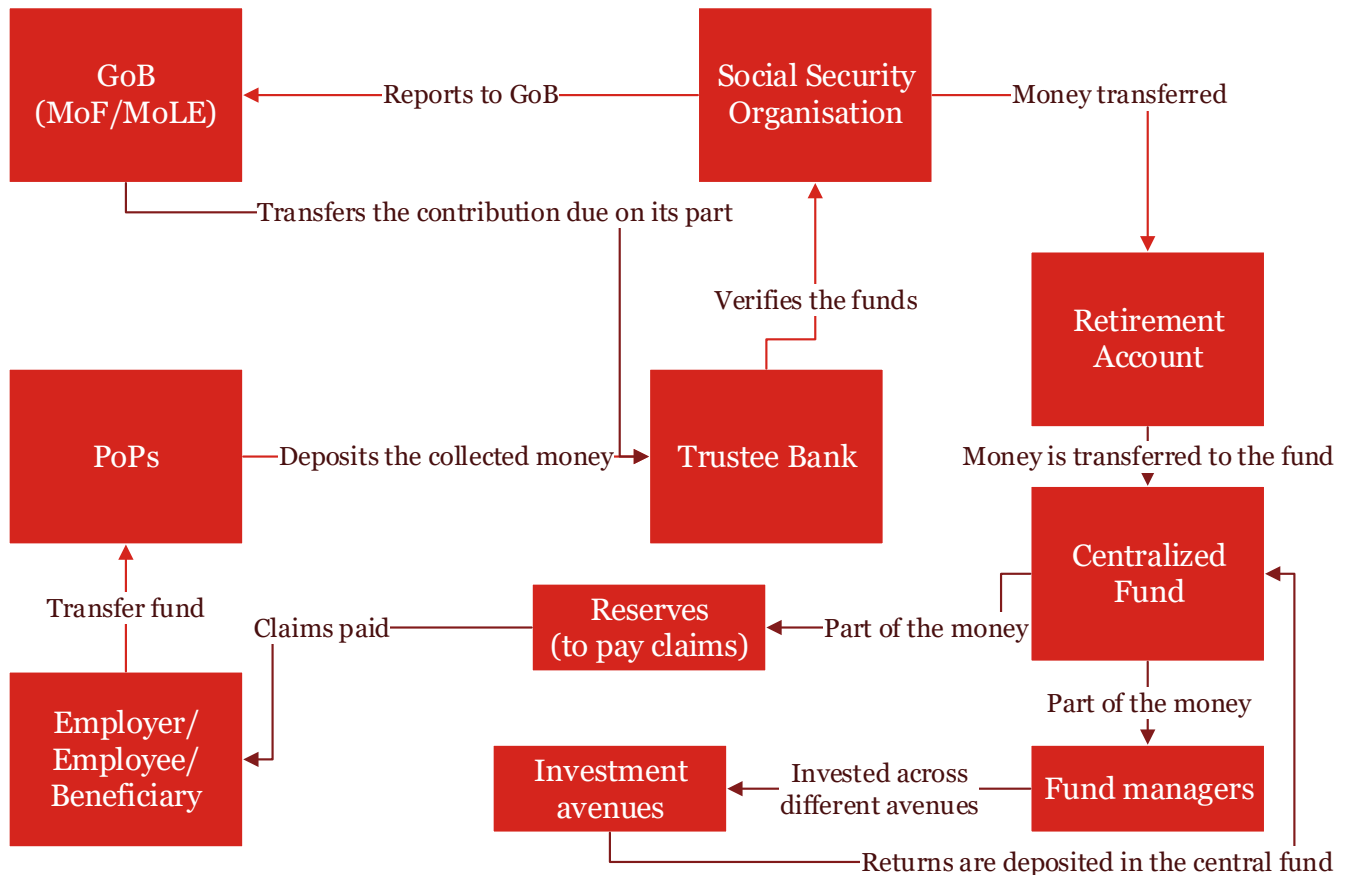
- Claims processing-** Once the beneficiary wishes to raise a claim, he can submit the details of the claim along with supported documents to the PoPs who forwards the same to the information agency. The SSO then verifies the claims and processes it to the retirement account which is then transferred to the beneficiary. The detailed process mapping is captured in **Figure 8**.

Figure 8: Claims processing



- **Funds flow process:** The employers and the employees deposit their contributions to the PoP and the GoB deposits its part of the contribution in the Trustee Bank. The PoP also deposits the aggregate amount to the trustee bank (under the SSO). The SSO will then verify the nature of funds of received and process it to the retirement account from where it is deposited in the Centralized fund. From the pooled fund, a part of the amount is reserved for payment of claims and the balance amount is invested in short term, medium and long term financial instruments (depending upon the type of scheme) (note: an assessment of investment options is outlined in the section 5.4). The whole process, which is shown in **Figure 9**, will be under the supervision of SSO.

Figure 9: Fund flow process of our proposed framework



5.4. Investment options

In order to increase the count of beneficiaries under the ambit of social protection schemes, the investment guidelines (under PvP scheme and especially for the Tier 1 and 2 schemes) should consider providing alternative investment opportunities to the beneficiaries. The rationale for such activity is given below.

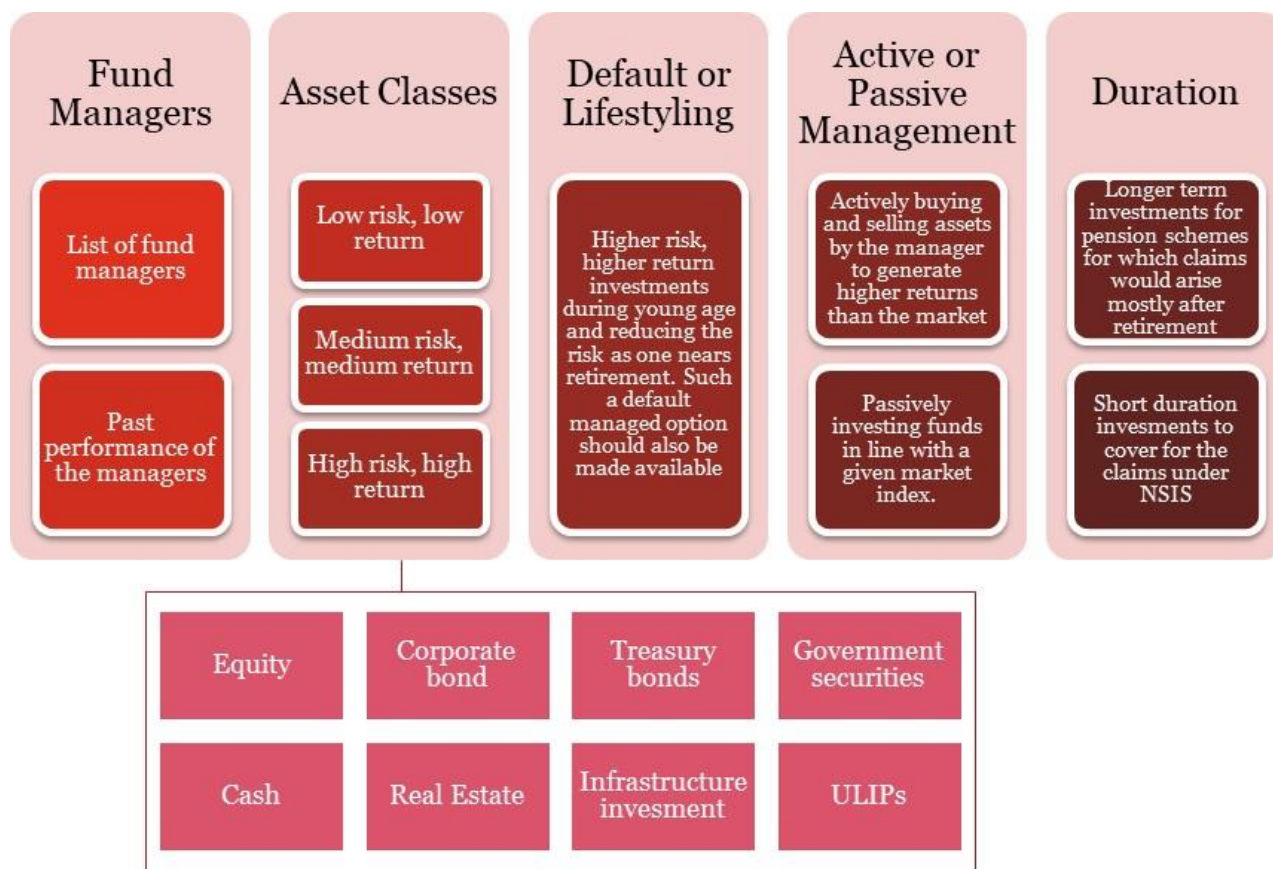
Based on the above hypothesis, we have classified the portfolio for an individual under 3 asset classes as given below:

- **Low risk, low return** – The portfolio would majorly consist of safer investment classes such as government bonds and a very small portion in equity investments. For risk averse individuals approaching retirement, their portfolios should belong to this class.
- **Medium risk, medium return** – This is classified by investments with a sizeable portion in equity as well as bonds. Portfolios of individuals transitioning from middle to old age belong to this class.
- **High risk, high return** – High investments in volatile assets or capital market, especially for individuals with a greater risk tolerance are categorised under this class. Portfolio of young aged employees represent this asset class.

(Note: We have not considered the impact of external sector on preference of asset class by individuals/beneficiaries).

Along with the option of choosing the asset class, the fund manager also holds a key position in determining investment choice of assets wisely. The guidelines should provide a list of fund managers which the individuals can entrust with their funds. For individuals with low financial knowledge, passive investment can be an option. The major considerations in the investment guidelines are highlighted in **Figure 10**.

Figure 10: Major considerations in investment guidelines



5.5. Proposed roadmap for implementation

Smooth implementation of NSIS and PVP would depend on following a glide path that would make it easy to reach out to all concerned stakeholders, sensitize them about the benefits, take them into confidence about the implementation arrangements that are being considered and address their concerns. In many ways, creation of a new institutional structure will be a game changer and thus the concern of employers and employees needs to be taken into account before rolling out these processes. Two most important stakeholders in this endeavour would be the industry associations and the trade unions. The new measures that are going to be implemented should not be perceived as imposition of new burden because of additional monetary considerations that are to be borne by the employers. Communication strategies should be carefully crafted that can help the employer to understand that investing in social security is an investment for the future that can generate higher returns in the long run by boosting consumption, create a more healthy labour force and thus help to create a more thriving and sustainable business ecosystem that can drive economic growth in Bangladesh. Workers will also have to understand the long-term benefits of taking ownership of their retirement in their own hands and focus on building a retirement corpus that can help them to lead a decent standard of life even after retirement.

It will be a difficult proposition to ensure to make all stakeholders agree in one go. Hence the proper way to start the implementation would be through a phased or a gradual approach. Various options that can be considered are given below:

1. **Geographical targeting:** NSIS and PVP can be considered for piloting in specific municipal areas or cities. Establishments falling within those areas will be asked to comply with the provisions of these schemes on mandatory basis. For a big city like Dhaka, it can consider targeting specific municipal areas to roll out these provisions

2. **Applicability for certain establishments or classes of establishment:** Govt of Bangladesh can think of rolling out these scheme provisions only for certain categories of establishment on selective basis. The idea would be to target those establishments where employer employee relationship can be easily identified and thus brought within the purview of the Act and scheme provisions.
3. **Targeting establishments having more than a certain number of employees:** Ramping up of subscribers would be rapid if the targeting is focussed, to start with, on establishments that have more than a certain threshold number of employees (e.g > 100 employees). Targeting would be relatively easier, and compliance would also be relatively straightforward.
4. **Applicability in certain sectors:** Other option for the decision makers would be to consider the rollout of these provisions on sectors that can have the highest impact on social protection. RMG sector can be a case in point and Govt of Bangladesh can think of rolling out these provisions for this sector to start with.
5. **Combination of the various options:** A combination of various options outlined in Sl No 1 to 4 above can also be considered from a piloting perspective. The key aspect would be to learn from the experience regarding the implementation challenges the organization is going to face, quickly come to terms with it and provide the levels of service the institution is mandated to provide. Establishing the credibility of the institution before all its stakeholders would be of paramount importance since good professional conduct evidenced through prompt and timely service deliveries will go a long way in reducing the frictional aspects of employer employee relationship with each side able to witness first-hand the potential benefits accruing to them from close quarters.

Annexures

Annexure 1. People met during inception phase

S.L.	Name of the stakeholder	Designation	Organisation
1.	Mohammad Tajul Islam	Director General	Bangladesh Bureau of Statistics
2.	Ghose Subobrata	Deputy Director General	
1.	Md. Mashud Alam	Director (Deputy Secretary)	
2.	Engr. C. S. Roy	Senior Maintenance Engineer-IT	
3.	Asif Ayub	Additional Secretary	Bangladesh Employers' Federation
4.	Md. Masudar Rahman	Deputy Secretary	
5.	AKM Asaduzzaman Patwary	Additional Secretary (R&D)	Dhaka Chamber of Commerce and Industry
6.	Gokul Chand Das	Member, Admin	Insurance Development and Regulatory Authority
7.	Tania Afrin	Public Relations Officer	
8.	Sakeun Nahar Begum	Additional Secretary	Ministry of Labour and Employment
9.	Farid Ahmed Mollah	Deputy Director (Programme-2)	Ministry of Social Welfare
10.	Sheikh Fazle Fahim	President	The Federation of Bangladesh Chambers of Commerce and Industry
11.	Md. Munir Hossain	Director	
12.	Aminul Arifeen	National Project Manager-Social Security Policy Support Programme (SSPS)	United Nations Development Programme
13.	Mohammad Mahfuzul Bari	ICT Expert	

(Note: The names of organizations are arranged in alphabetical order. Hence, the names of officials appear against respective organizations)

Annexure 2. Estimation of fiscal space

Parameters	Units	Sources	Financial years						
			2016-17	2017-18	2018-19	2019-20 (est.)	2020-21 (est.)	2022-23	2023-24 (est.)
GDP (nominal)	Billion USD	IMF databank	235.62	262.08	288.42	317.46	347.99	380.86	416.84
GDP (nominal)	Billion BDT (assumption: 1 USD = 84.84 BDT)	Bangladesh Bureau of Statistics	19990.00	22234.87	24469.55	26933.31	29523.47	32312.16	35364.71
Budget size	Billion BDT	UNDP data	3171.74	3714.95	4425.21	4874.93	5509.08	6210.40	6995.14
Budget size as a % of GDP (nominal)			15.87%	16.71%	18.08%	18.10%	18.66%	19.22%	19.78%
Total budget allocated for current social programs	Billion BDT	UNDP data	408.57	485.24	644.04	743.67	679.04	743.18	813.39
		Assumption based on NSSS Action plan	2.04%	2.18%	2.63%	2.76%	2.30%	2.30%	2.30%
Budget for social spending as a % of total budget			12.88%	13.06%	14.55%	15.25%	15.84%	16.43%	17.02%
Forecasted budget for the social protection programs (current as well as NSSS)	Billion BDT					743.67	872.91	1,020.68	1,190.92
Scenario 1: Assuming that after implementation of NSIS and PVP, GoB will continue implementing current programs/schemes									
Estimated fiscal space	Billion BDT						193.87	277.50	377.53
							0.7198%	0.9399%	1.1684%
Scenario 2: Consolidation of programs with similar scope									
Fiscal space available under Scenario 1	Billion BDT						193.87	277.50	377.53
Additional fiscal headroom generated through consolidation of schemes	Billion BDT						310.66	310.66	310.66
Gross fiscal space available under scenario 2	Billion BDT						504.53	588.16	688.19

Annexure 3. Estimation of count of beneficiaries

Focus areas	Parameters (independent & dependent variables)	Units	Data source	Financial Years			
				2019-20	2020-21	2021-22	2022-23
Sickness							
For universal schemes	Population	Millions	IMF economic outlook	168.31	170.06	171.82	173.60
	Working age population	Millions	PwC analysis	113.78	114.96	116.15	117.35
	Morbidity rate	in %	Statistical pocketbook 2018	11.21%	11.21%	11.21%	11.21%
	No. of beneficiaries	Millions	PwC calculations	12.75	12.89	13.02	13.15
For the working population in formal sector	No. of persons working in the formal sector	Millions	Labour force survey 2016-17	8.91	9.05	9.19	9.33
	Morbidity rate	in %	Statistical pocketbook 2018	11.21%	11.21%	11.21%	11.21%
	No. of beneficiaries	Millions	PwC calculations	1.00	1.01	1.03	1.05
For the entire working population	No. of working population	Millions	Labour force survey 2016-17	63.67	64.66	65.66	66.67
	Morbidity rate	in %	Statistical pocketbook 2018	11.21%	11.21%	11.21%	11.21%
	No. of beneficiaries	Millions	PwC calculations	7.14	7.25	7.36	7.47
Maternal insurance							
For universal schemes	Population (number of women)	Millions	IMF economic outlook	83.74	84.60	85.48	86.37
	No. of working age women	Millions	PwC Analysis	57.28	57.87	58.47	59.08
	Fertility rate per women		Statistical pocketbook 2018	2.05	2.05	2.05	2.05
	Average number of births per women per year		PwC calculations	0.06	0.06	0.06	0.06
	Total beneficiaries	Millions	PwC calculations	3.67	3.71	3.75	3.78
For the working population in formal sector	No. of women working in the formal sector	Millions	Labour force survey 2016-17	1.49	1.52	1.54	1.57
	Fertility rate		Statistical pocketbook 2018	2.05	2.05	2.05	2.05
	Average number of births per women per year		PwC calculations	0.06	0.06	0.06	0.06
	No. of beneficiaries	Millions	PwC calculations	0.10	0.10	0.10	0.10
For the entire working population	No. of working women	Millions	Labour force survey 2016-17	19.52	19.82	20.13	20.44
	Fertility rate per women		Statistical pocketbook 2018	2.05	2.05	2.05	2.05
	Average number of births per women per year		PwC calculations	0.06	0.06	0.06	0.06
	No. of beneficiaries	Millions	PwC calculations	1.25	1.27	1.29	1.31

Focus areas	Parameters (independent & dependent variables)	Units	Data source	Financial Years			
				2019-20	2020-21	2021-22	2022-23
Employment related injury							
Joint contributions between employer and employee	No. of persons working in the formal sector	Millions	Labour force survey 2016-17	8.91	9.05	9.19	9.33
	Temporary disability	Per million people		0.0061	0.0061	0.0061	0.0061
	Permanent disability	Per million people		0.000044	0.000044	0.000044	0.000044
	Partial disability	Per million people		0.000477	0.000477	0.000477	0.000477
	People having received healthcare facility	Per million people		0.000004	0.000004	0.000004	0.000004
	Aggregate incidence rate	Per million people	ILO Technical Recommendation on Feasibility Assessment of Employment Injury Scheme in Bangladesh	0.006625	0.006625	0.006625	0.006625
	No. of beneficiaries	Millions	PwC calculations	0.06	0.06	0.06	0.06
Co-contributions government, employer and employee	No. of working population	Millions	Labour force survey 2016-17	63.67	64.66	65.66	66.67
	Incident rate	Per million people	ILO Technical Recommendation	0.06	0.06	0.06	0.06
	No. of beneficiaries	Millions	PwC calculations	3.76	3.88	4.00	4.12
Unemployment							
Joint contributions between employer and employee	Population	Millions	IMF economic outlook	168.31	170.06	171.82	173.60
	Labour force participation		PwC calculations	39%	39%	39%	39%
	Total labour force	Millions	PwC calculations	65.64	66.32	67.01	67.70
	No. of persons working in the formal sector	Millions	Labour force survey 2016-17	8.91	9.05	9.19	9.33
	Unemployment as a % of labour force		IMF economic outlook	4.17%	4.17%	4.17%	4.17%
	Total unemployment in the labour force	Millions	PwC calculations	2.74	2.77	2.79	2.82
	Number of beneficiaries	Millions	PwC calculations	0.38	0.39	0.39	0.40
Co-contributions government, employer and employee	Population	Millions	IMF economic outlook	168.31	170.06	171.82	173.60
	Labour force growth		PwC calculations	39%	39%	39%	39%
	Total labour force	Millions	PwC calculations	65.64	66.32	67.01	67.70
	Unemployment as a % of labour force		IMF economic outlook	4.17%	4.17%	4.17%	4.17%
	Number of beneficiaries	Millions	PwC calculations	2.74	2.77	2.79	2.82

Annexure 4. Possible consolidation of programmes

Sickness		Employment Injury/ Accident		Maternity		Unemployment		Pension	
Program(s)	Budget (in crore BDT)	Program(s)	Budget (in crore BDT)	Program(s)	Budget (in crore BDT)	Program(s)	Budget (in crore BDT)	Program(s)	Budget (in crore BDT)
Community Based Health Care	1001.9	Welfare Trust for Physical disabilities	10	Maternal, Neo-natal, Child and Adolescent Health	987.6	Income Support Program for the Poorest	432.02	Pension for Retired Government Employees and their Families	22639.46
T.B., Leprosy, Communicable Non-communicable Disease	859.97	Total	10	Maternity Allowance Programme for the Poor	693	Development of living standards of extinct enclaves	68.75	Honorarium for Freedom Fighters	3305
Urban Primary Health Care (Urban Primary Health Care Service Delivery)	19.91			Allowances for Urban Low-income Lactating Mothers	248.5	Programme for Improving the Livelihood of Harijan, Dalit, Bade community (Bede and disadvantage community 2017-18)	27	Honorarium & Medical Allowances for Injured Freedom Fighters	295.07
Total	1881.78			Maternal, Child, Reproductive and Adolescent Health	194	Rehabilitation and Creation of Alternative Employment for Beggars Profession	3	Ration for Shaheed Family and Injured Freedom Fighters	33.05
				Child and Maternal Health & Health Management Development	151.01	Income Generating Activities for Women at Upazila Level	61.16	Universal Pension Insurance Scheme	12
				Total	2274.11	Employment of Ultra Poor in Northern Areas	23.28	Total	26284.58
						Total	615.21		

Annexure 5. Estimation of tenure of contribution

	Unit	Data Source	FY 2019-20
Sickness			
Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568
Contribution of employee per month	BDT	PwC Analysis	155
Total contribution per employee per year	BDT	PwC Analysis	1,864.67
Employee corpus	Million BDT	PwC Analysis	16,621.12
Contribution of employer per month for each employee	BDT	PwC Analysis	155
Contribution of employer per year for each employee	BDT	PwC Analysis	1,864.67
Employer corpus	Million BDT	PwC Analysis	16,621
Total pooled fund	Million BDT	PwC Analysis	33,242.24
Monthly benefit amount	BDT	ILO Convention	9,341
Benefit amount per day per person	BDT	PwC Analysis	311.36
Total benefit amount per day	Million BDT	PwC Analysis	311.09
No of days of benefits that can be received per year	Days	PwC Analysis	107
No of years required for 91 days of benefits		PwC Analysis	0.85
No. of months of contribution required to have 91 days of benefits	Months	PwC Analysis	10
Maternity			
Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568
Contribution per month	BDT	PwC Analysis	121.45
Total contribution per employee per year	BDT	PwC Analysis	1,457.38
Employee corpus	Million BDT	PwC Analysis	2,178.44
Contribution of employer per month for each employee	BDT	PwC Analysis	121.45
Contribution of employer per year for each employee	BDT	PwC Analysis	1,457.38
Employer corpus	Million BDT	PwC Analysis	2,178.44
Total pooled fund	Million BDT	PwC Analysis	4,356.89
Monthly benefit amount	BDT	ILO Convention	10,378.73
benefit amount per day per beneficiary	BDT	PwC Analysis	346
Total benefit amount per day	Million BDT		33.13
No of days of benefits that can be received in per year	Days	PwC Analysis	132
No of weeks of benefits received per year	Weeks	PwC Analysis	18.79
No. of years required to have 16 weeks of benefits	Years	PwC Analysis	1
No. of months of contribution required to have 91 days of benefits	Months	PwC Analysis	10.22

Unemployment			
Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568
Contribution per month	BDT	PwC Analysis	76
Total contribution per employee per year	BDT	PwC Analysis	906.69
Employee corpus	Million BDT	PwC Analysis	8,082.01
Contribution of employer per month for each employee	BDT	PwC Analysis	75.56
Contribution of employer per year for each employee	BDT	PwC Analysis	906.69
Employer corpus	Million BDT	PwC Analysis	8,082.01
Total pooled fund	Million BDT	PwC Analysis	16,164.02
Monthly benefit amount	BDT	ILO Convention	7,006
Benefit amount per day per person	BDT	PwC Analysis	233.52
Benefit amount per day	Million BDT	PwC Analysis	639.21
No of days of benefits that can be received per year	Days	PwC Analysis	25
No. of years required for 182 days of benefits	Years	PwC Analysis	7.20
No of months of contribution required	Months	PwC Analysis	86
Employment Injury			
Average monthly wage per person	BDT	LFS 2016-17 and PwC Analysis	15,568
Contribution per month	BDT	PwC Analysis	123.23
Total contribution per employee per year	BDT	PwC Analysis	1,478.76
Employee corpus	Million BDT	PwC Analysis	13,181
Contribution of employer per month for each employee	BDT	PwC Analysis	123
Contribution of employer per year for each employee	BDT	PwC Analysis	1,478.76
Employer corpus	Million BDT	PwC Analysis	13,181
Total pooled fund	Million BDT	PwC Analysis	26,363
Monthly benefit amount	BDT	ILO Convention	9,341
Benefit amount per day per person	BDT	PwC Analysis	311.36
Benefit amount per day	Million BDT	PwC Analysis	18
No of days of benefits that can be received per year	Days	PwC Analysis	1,434
No. of years required for 31 days of benefits		PwC Analysis	0.02
No. of months of contribution required	Months	PwC Analysis	0.259
No. of days of contribution required	Days	PwC Analysis	8

Annexure 6. Calculation of Cost and Contribution rates

Sickness

Scenario 1: Universal scheme (Government sponsored)							
	Units	Data Source					Average
			2019-20	2020-21	2021-22	2022-23	
No of beneficiaries	Millions	LFS 2016-17	12.75	12.89	13.02	13.15	
Expected duration of benefits	Days	ILO Convention and PwC Analysis	91.00	91.00	91.00	91.00	
Benefit cost per day per beneficiary	BDT	ILO Convention	311.36	328.49	346.55	365.61	
Total cost	Million BDT	PwC Analysis	361,356.13	385,180.92	410,573.96	437,645.48	
Scenario 2: For the working population in the formal sector							
No of persons in the working pool	Million	LFS 2016-17	8.91	9.05	9.19	9.33	
No. of beneficiaries	Million	PwC Analysis	1.00	1.01	1.03	1.05	
Expected duration of benefits	Days	ILO Convention and PwC Analysis	91	91	91	91	
Benefit cost per day per beneficiary	BDT	ILO convention	311	328	347	366	
Total cost	Million BDT	PwC Calculation	28,310	30,329	32,493	34,811	
Net income	Million BDT	PwC Calculation	1,418,138	1,519,312	1,627,703	1,743,828	
Total contribution required		PwC Calculation	2.00%	2.00%	2.00%	2.00%	2.00%
Contribution by Employer		PwC Calculation	1.00%	1.00%	1.00%	1.00%	1.00%
Contribution by Employee		PwC Calculation	1.00%	1.00%	1.00%	1.00%	1.00%
Scenario 3: For the entire working population							
Target population	Million	LFS 2016-17	63.67	64.66	65.66	66.67	
No. of beneficiaries	Million	PwC Analysis	7.14	7.25	7.36	7.47	
Expected duration of benefits	Days	ILO Convention and PwC Analysis	91	91	91	91	
Benefit cost per day per beneficiary	BDT	ILO Convention	311.36	328.49	346.55	365.61	
Total cost	Million BDT	PwC Calculation	202,211	216,637	232,093	248,651	
Total cost for government-employee contribution	Million BDT	PwC Calculation	89,579	95,970	102,817	110,152	
Total cost for self-employed individuals	Million BDT	PwC Calculation	112,632	120,667	129,276	138,499	
Net income	Million BDT	PwC Calculation	11,894,546	12,743,132	13,652,259	14,626,246	
Net income for self employed persons	Million BDT	PwC Calculation	5,269,284	5,645,208	6,047,951	6,479,427	
Net income for employed persons	Million BDT	PwC Calculation	6,625,262	7,097,925	7,604,309	8,146,819	
Total contribution required for employer-employee scheme		PwC Calculation	1.70%	1.70%	1.70%	1.70%	1.70%
Contribution by Employer		PwC Calculation	0.85%	0.85%	0.85%	0.85%	0.85%
Contribution by Employee		PwC Calculation	0.85%	0.85%	0.85%	0.85%	0.85%
Total contribution required for self-employed individuals		PwC Calculation	1.70%	1.70%	1.70%	1.70%	1.70%
Contribution by Government		PwC Calculation	1.36%	1.36%	1.36%	1.36%	1.36%
Contribution by Employee		PwC Calculation	0.34%	0.34%	0.34%	0.34%	0.34%

Maternity

Scenario 1: Universal Scheme (Government Sponsored)							
	Units	Data Source	2019-20	2020-21	2021-22	2022-23	Average
No of beneficiaries	Million	PwC Analysis	3.67	3.71	3.75	3.78	
Expected duration of benefits	Days	PwC Analysis	112	112	112	112	
Benefit cost per day per beneficiary	BDT	ILO Convention	319.76	337.35	355.90	375.47	
Total expected cost	Million BDT	PwC Calculation	131,407	140,071	149,305	159,150	
Scenario 2: For the working population in the formal sector							
No of working women in formal sector	Millions	LFS 2016-17	1.49	1.52	1.54	1.57	
No. of beneficiaries	Millions	PwC Analysis	0.10	0.10	0.10	0.10	
Expected duration of benefits	Days	PwC Analysis	112	112	112	112	
Benefit cost per day per beneficiary	BDT	ILO Convention	319.76	337.35	355.90	375.47	
Total cost	Million BDT	PwC Calculation	3,429.41	3,674.07	3,936.18	4,217.00	
Net income	Million BDT	LFS 2016-17	219,803	235,484	252,284	270,283	
Required contribution		PwC Calculation	1.56%	1.56%	1.56%	1.56%	1.56%
Contribution by Employer		PwC Calculation	0.78%	0.78%	0.78%	0.78%	0.78%
Contribution by Employee		PwC Calculation	0.78%	0.78%	0.78%	0.78%	0.78%
Scenario 3: For the entire working population							
No of working women	Millions	LFS 2016-17	19.52	19.82	20.13	20.44	
No. of beneficiaries	Millions	PwC Analysis	1.25	1.27	1.29	1.31	
Expected duration of benefits	Days	PwC Analysis	112	112	112	112	
Benefit cost per day per beneficiary	BDT	ILO Convention	319.76	337.35	355.90	375.47	
Total cost	Million BDT	PwC Calculation	44,777	47,972	51,394	55,061	
Total cost for self employed individuals	Million BDT	PwC Calculation	19,836	21,252	22,768	24,392	
Total cost for employer-employee contribution	Million BDT	PwC Calculation	24,941	26,720	28,627	30,669	
Net income	Million BDT	LFS 2016-17	3,370,000	3,610,424	3,868,001	4,143,954	
Net income for self employed persons	Million BDT	PwC Calculation	1,492,910	1,599,418	1,713,524	1,835,771	
Net income for employed persons	Million BDT	PwC Calculation	1,877,090	2,011,006	2,154,476	2,308,182	
Required contribution for employer-employee scheme		PwC Calculation	1.33%	1.33%	1.33%	1.33%	1.33%
Contribution by Employer		PwC Calculation	0.66%	0.66%	0.66%	0.66%	0.66%
Contribution by Employee		PwC Calculation	0.66%	0.66%	0.66%	0.66%	0.66%
Total contribution required for self-employed individuals		PwC Calculation	1.33%	1.33%	1.33%	1.33%	1.33%
Contribution by Government		PwC Calculation	1.06%	1.06%	1.06%	1.06%	1.06%
Contribution by Employee		PwC Calculation	0.27%	0.27%	0.27%	0.27%	0.27%

Employment Injury

Scenario 2		For the working population in the formal sector					Average
	Units	Data Source	2019-20	2020-21	2021-22	2022-23	
No of persons in the formal sector		LFS 2016-17	8.91	9.05	9.19	9.33	
Incident rates							
<i>Temporary disability</i>	per million people	ILO Technical Recommendation on Feasibility Assessment of Employment	0.006100	0.006100	0.006100	0.006100	
<i>Permanent disability</i>	per million people		0.000044	0.000044	0.000044	0.000044	
<i>Partial disability</i>	per million people		0.000477	0.000477	0.000477	0.000477	
<i>People having received healthcare facility</i>	per million people		0.000004	0.000004	0.000004	0.000004	
Aggregated incident rate			0.006625	0.006625	0.006625	0.006625	
No. of beneficiaries							
<i>Temporary disability</i>	Million	PwC Calculation	0.054374	0.055216	0.056071	0.056940	
<i>Permanent disability</i>	Million		0.000392	0.000398	0.000404	0.000411	
<i>Partial disability</i>	Million		0.004252	0.004318	0.004385	0.004453	
<i>People having received healthcare facility</i>	Million		0.000036	0.000036	0.000037	0.000037	
Total no of beneficiaries	Million		0.059053	0.059968	0.060897	0.061840	
Duration (temporary disability)	Days		31	31	31	31	
Cost for temporary disability	Million	PwC Calculation	524.83	562.27	602.38	645.36	
PV of permanent disability		ILO Technical Recommendation on Feasibility Assessment of Employment	28	28	28	28	
Expected level of permanent disability		Injury Scheme in	43.70%	43.70%	43.70%	43.70%	
Expected level of partial disability			7.80%	7.80%	7.80%	7.80%	
Monthly Benefit cost	BDT	PwC Calculation	9,341	9,855	10,397	10,968	
Annual Benefit cost	BDT	PwC Calculation	112,090.26	118,255.23	124,759.27	131,621.03	
Cost for Permanent disability	Million BDT	PwC Calculation	538	576	617	661	
Cost for Partial disability	Million BDT	PwC Calculation	1,041	1,115	1,195	1,280	
Annual benefit cost for care assist		ILO Technical Recommendation	93,408.55	98,546.02	103,966.05	109,684.19	
PV of care and assist benefit			28	28	28	28	
Cost for people having received healthcare facility	Million BDT	PwC Calculation	93.25	99.91	107.03	114.67	
Total cost associated	Million BDT	PwC Calculation	2,197	2,354	2,522	2,701	
Net Income	Million BDT	LFS 2016-17	138,770	148,670	159,276	170,640	
Contribution rate		PwC Calculation	1.58%	1.58%	1.58%	1.58%	1.58%
Contribution by Employer		PwC Calculation	0.79%	0.79%	0.79%	0.79%	0.79%
Contribution by Employee		PwC Calculation	0.79%	0.79%	0.79%	0.79%	0.79%

Scenario 3		For the entire working population				
Target population			63.67	64.66	65.66	66.67
Incident rates						
Temporary disability	per million people	ILO Technical Recommendation on Feasibility Assessment of Employment	0.006100	0.006100	0.006100	0.006100
Permanent disability	per million people		0.000044	0.000044	0.000044	0.000044
Partial disability	per million people		0.000477	0.000477	0.000477	0.000477
People having received healthcare facility	per million people		0.000004	0.000004	0.000004	0.000004
Aggregated incident rate			0.006625	0.006625	0.006625	0.006625
No. of beneficiaries						
Temporary disability	Million	PwC Calculation	0.388384	0.394400	0.400509	0.406714
Permanent disability	Million		0.002801	0.002845	0.002889	0.002934
Partial disability	Million		0.030370	0.030841	0.031319	0.031804
People having received healthcare facility	Million		0.000255	0.000259	0.000263	0.000267
Total no. of beneficiaries	Million		0.421810	0.428344	0.434980	0.441718
Duration (temporary disability)	Days	PwC Analysis	31	31	31	31
Cost of temporary disability	Million	PwC Calculation	3,748.76	4,016.21	4,302.74	4,609.71
PV of permanent disability		ILO Technical Recommendation	28	28	28	28
Expected level of permanent disability		on Feasibility	43.70%	43.70%	43.70%	43.70%
Expected level of partial disability			7.80%	7.80%	7.80%	7.80%
Monthly Benefit cost	BDT	PwC Calculation	9,341	9,855	10,397	10,968
Annual Benefit cost	BDT	PwC Calculation	112,090.26	118,255.23	124,759.27	131,621.03
Cost for Permanent disability	Million BDT	PwC Calculation	3,842	4,116	4,410	4,725
Cost for Partial disability	Million BDT	PwC Calculation	7,435	7,965	8,533	9,142
Annual benefit cost for care assist		ILO Technical Recommendation	93,408.55	98,546.02	103,966.05	109,684.19
PV of care and assist benefit			28	28	28	28
Cost for people having received healthcare facility	Million BDT	PwC Calculation	666.09	713.62	764.53	819.07
Total cost associated	Million BDT	PwC Calculation	15,692	16,811	18,011	19,296
Cost for employer-employee scheme	Million BDT	PwC Calculation	8,740	9,364	10,032	10,748
Cost for self-employed individuals	Million BDT	PwC Calculation	6,952	7,447	7,979	8,548
Net Income	Million BDT	LFS 2016-17	11,894,546	12,743,132	13,652,259	14,626,246
Net Income for employed individuals	Million BDT	LFS 2016-17	6,625,262	7,097,925	7,604,309	8,146,819
Net Income for self-employed individuals	Million BDT	LFS 2016-17	5,269,284	5,645,208	6,047,951	6,479,427
Total contribution required for employer-employee scheme		PwC Calculation	0.13%	0.13%	0.13%	0.13%
Contribution by Employer		PwC Calculation	0.07%	0.07%	0.07%	0.07%
Contribution by Employee		PwC Calculation	0.07%	0.07%	0.07%	0.07%
Total contribution required for self-employed individuals			0.13%	0.13%	0.13%	0.13%
Contribution by government			0.11%	0.11%	0.11%	0.11%
Contribution by employee			0.03%	0.03%	0.03%	0.03%

Unemployment

Scenario 2	For the working population in the formal sector						Average
	Units	Data Source	2019-20	2020-21	2021-22	2022-23	
Eligible population	Million	LFS 2016-17	8.914	9.052	9.192	9.334	
No of beneficiaries	Million	PwC Analysis	0.383	0.387	0.391	0.395	
Duration of benefit	Days	ILO Convention and PwC Analysis	182	182	182	182	
Benefit cost per person per day	BDT	ILO Convention and PwC Calculation	234	246	260	274	
Net benefit cost	Million BDT	PwC Calculation	16,287	17,361	18,505	19,726	
Net income	Million BDT	LFS 2016-17	1,665,236	1,784,039	1,911,316	2,047,674	
Required contribution		PwC Calculation	0.98%	0.97%	0.97%	0.96%	0.97%
Contribution by Employer		PwC Calculation	0.49%	0.49%	0.48%	0.48%	0.49%
Contribution by Employee		PwC Calculation	0.49%	0.49%	0.48%	0.48%	0.49%
Scenario 3	For the entire working population						
Population in labour pool	Million	LFS 2016-17	65.642	66.322	67.009	67.703	
No of beneficiaries	Million	PwC Analysis	2.74	2.77	2.79	2.82	
Duration of benefit	Days	ILO Convention and PwC Analysis	182	182	182	182	
Benefit cost per person per day	BDT	ILO Convention and PwC Calculation	234	246	260	274	
Net benefit cost	Million BDT	PwC Calculation	116,336	124,006	132,181	140,897	
Total cost for government-employee contribution	Million BDT	PwC Calculation	51,537	54,935	58,556	62,417	
Total cost for employer-employee contribution	Million BDT	PwC Calculation	64,799	69,071	73,625	78,479	
Net income	Million BDT	LFS 2016-17	12,262,989	13,071,507	13,933,246	14,851,945	
Net income for self employed persons	Million BDT	PwC Calculation	5,432,504	5,790,678	6,172,428	6,579,412	
Net income for employed persons	Million BDT	PwC Calculation	6,830,485	7,280,829	7,760,818	8,272,534	
Total contribution required for employer-employee scheme		PwC Calculation	0.95%	0.95%	0.95%	0.95%	0.95%
Contribution by Employer		PwC Calculation	0.47%	0.47%	0.47%	0.47%	0.47%
Contribution by Employee		PwC Calculation	0.47%	0.47%	0.47%	0.47%	0.47%
Total contribution required for self-employed individuals		PwC Calculation	0.95%	0.95%	0.95%	0.95%	0.95%
Contribution by Government		PwC Calculation	0.76%	0.76%	0.76%	0.76%	0.76%
Contribution by Employee		PwC Calculation	0.19%	0.19%	0.19%	0.19%	0.19%

Annexure 7. Distribution of contributions

Scenario 2: For the working population in the formal sector	
	Contribution required
Sickness	2.00%
Maternity	1.56%
EII	1.58%
Unemployment	0.97%
Total contribution required	6.11%
Employer's contribution	3.06%
Employee's contribution	3.06%
Scenario 3: For the entire working population	
Sickness	1.70%
Maternity	1.33%
EII	0.13%
Unemployment	0.95%
Total contribution required for employer-employee scenario	4.11%
Employer's contribution	2.05%
Employee's contribution	2.05%
Total contribution required for self-employed persons	4.11%
Government contribution	3.29%
Employee's contribution	0.82%
Share of government contribution in scenario 3 (80:20 contribution)	418,927
When the government contribution is in ratio 90:10	
Total contribution required for self-employed persons	4.11%
Government contribution	3.70%
Employee's contribution	0.41%
Share of government contribution in scenario 3 (80:20 contribution)	471,292
When the government contribution is in ratio 70:30	
Total contribution required for self-employed persons	4.11%
Government contribution	2.88%
Employee's contribution	1.23%
Share of government contribution in scenario 3 (80:20 contribution)	366,561

Annexure 8. Estimation of cost and rate of contribution in PvP

Tier o (contribution up to 60 years)

Age(x)	Mortality rate(qx)	px	tpx	v	v ^t	v ^t *tpx
28	0.001017	0.998983				
29	0.001034	0.998966	0.998966	0.911951119	0.911951119	0.911008162
30	0.001056	0.998944	0.997911092	0.911951119	0.831654844	0.829917594
31	0.001084	0.998916	0.996829356	0.911951119	0.758428566	0.756023859
32	0.001119	0.998881	0.995713904	0.911951119	0.69164978	0.688685303
33	0.001164	0.998836	0.994554893	0.911951119	0.630750791	0.627316286
34	0.001218	0.998782	0.993343525	0.911951119	0.57521389	0.571384993
35	0.001282	0.998718	0.992070059	0.911951119	0.524566951	0.520407166
36	0.001358	0.998642	0.990722828	0.911951119	0.478379418	0.47394141
37	0.001447	0.998553	0.989289252	0.911951119	0.436258646	0.431585989
38	0.001549	0.998451	0.987756843	0.911951119	0.39784656	0.392975662
39	0.001667	0.998333	0.986110252	0.911951119	0.362816616	0.357777185
40	0.001803	0.998197	0.984332295	0.911951119	0.330871019	0.32568703
41	0.001959	0.998041	0.982403988	0.911951119	0.301738196	0.296428808
42	0.00214	0.99786	0.980301644	0.911951119	0.275170486	0.26975008
43	0.00235	0.99765	0.977997935	0.911951119	0.250942033	0.24542079
44	0.002593	0.997407	0.975461986	0.911951119	0.228846868	0.22323142
45	0.002874	0.997126	0.972658509	0.911951119	0.208697157	0.202991066
46	0.003197	0.996803	0.969548919	0.911951119	0.190321606	0.184526107
47	0.003567	0.996433	0.966090538	0.911951119	0.173564002	0.16767854
48	0.003983	0.996017	0.9622426	0.911951119	0.158281886	0.152305573
49	0.004444	0.995556	0.957966394	0.911951119	0.144345343	0.138277987
50	0.004946	0.995054	0.953228292	0.911951119	0.131635897	0.125479061
51	0.005483	0.994517	0.948001741	0.911951119	0.120045504	0.113803346
52	0.006051	0.993949	0.942265383	0.911951119	0.109475631	0.103155098
53	0.006643	0.993357	0.936005914	0.911951119	0.099836425	0.093447484
54	0.007256	0.992744	0.929214255	0.911951119	0.091045939	0.084601184
55	0.007888	0.992112	0.921884613	0.911951119	0.083029446	0.076543569
56	0.008543	0.991457	0.914008953	0.911951119	0.075718796	0.069207658
57	0.009225	0.990775	0.90557722	0.911951119	0.069051841	0.062531774
58	0.009944	0.990056	0.89657216	0.911951119	0.062971904	0.056458856
59	0.010709	0.989291	0.886970769	0.911951119	0.057427298	0.050936335
60	0.011534	0.988466	0.876740448	0.911951119	0.052370889	0.045915677

Calculation of temporary annuity payable

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	9.66%
Temporary annuity payable in arrears	BDT	PwC Analysis	9.64940105

Legends:	
px	Probability that an individual aged x is alive at x+1
tpx	Probability that an individual aged x is alive x+t
v	Discount factor for an assured annuity
t	Time period, in Integers

Tier o (60 years to life)

Age(x)	Mortality rate(qx)	px	tpx	v	v ^t	v ^t *tpx
60	0.011534	0.9885				
61	0.012431	0.9876	0.987569	0.912	0.912	0.900614655
62	0.013414	0.9866	0.974321749	0.912	0.8317	0.810299403
63	0.014497	0.9855	0.960197007	0.912	0.7584	0.728240839
64	0.015691	0.9843	0.945130556	0.912	0.6916	0.653699341
65	0.017009	0.983	0.92905483	0.912	0.6308	0.586002069
66	0.018462	0.9815	0.91190262	0.912	0.5752	0.524539053
67	0.020061	0.9799	0.893608941	0.912	0.5246	0.468757718
68	0.021819	0.9782	0.874111288	0.912	0.4784	0.418156849
69	0.023746	0.9763	0.853354641	0.912	0.4363	0.37228334
70	0.025855	0.9741	0.831291157	0.912	0.3978	0.330726328
71	0.028159	0.9718	0.807882829	0.912	0.3628	0.293113314
72	0.030673	0.9693	0.783102639	0.912	0.3309	0.259105968
73	0.033412	0.9666	0.756937614	0.912	0.3017	0.22839699
74	0.036394	0.9636	0.729389626	0.912	0.2752	0.200706498
75	0.039637	0.9604	0.70047881	0.912	0.2509	0.175779576
76	0.043162	0.9568	0.670244743	0.912	0.2288	0.15338341
77	0.046991	0.953	0.638749273	0.912	0.2087	0.133305157
78	0.051149	0.9489	0.606077886	0.912	0.1903	0.115349717
79	0.055662	0.9443	0.572342379	0.912	0.1736	0.099338034
80	0.060558	0.9394	0.537682469	0.912	0.1583	0.085105395
81	0.06587	0.9341	0.502265325	0.912	0.1443	0.07249966
82	0.07163	0.9284	0.46628806	0.912	0.1316	0.061380247
83	0.077876	0.9221	0.429975411	0.912	0.12	0.051616615
84	0.084645	0.9154	0.393580142	0.912	0.1095	0.043087435
85	0.091982	0.908	0.357377853	0.912	0.0998	0.035679327
86	0.09993	0.9001	0.321665085	0.912	0.091	0.0292863
87	0.10854	0.8915	0.286751556	0.912	0.083	0.023808823
88	0.117866	0.8821	0.252953297	0.912	0.0757	0.019153319
89	0.127963	0.872	0.220584635	0.912	0.0691	0.015231775
90	0.138895	0.8611	0.189946532	0.912	0.063	0.011961295
91	0.150727	0.8493	0.161316461	0.912	0.0574	0.009263968
92	0.163532	0.8365	0.134936057	0.912	0.0524	0.007066721
93	0.177387	0.8226	0.111000155	0.912	0.0478	0.005301333
94	0.192374	0.8076	0.089646611	0.912	0.0436	0.003904514
95	0.208585	0.7914	0.070947673	0.912	0.0397	0.002818012
96	0.226114	0.7739	0.054905411	0.912	0.0362	0.001988801
97	0.245067	0.7549	0.041449906	0.912	0.033	0.001369214
98	0.265555	0.7344	0.030442677	0.912	0.0301	0.000917069
99	0.287699	0.7123	0.021684349	0.912	0.0275	0.000595713
100	0.311628	0.6884	0.014926899	0.912	0.0251	0.000373966
101	0.337482	0.6625	0.009889339	0.912	0.0228	0.000225944
102	0.365411	0.6346	0.006275666	0.912	0.0208	0.000130757
103	0.395577	0.6044	0.003793157	0.912	0.019	7.20739E-05
104	0.428153	0.5718	0.002169105	0.912	0.0173	3.75863E-05
105	0.463327	0.5367	0.0011641	0.912	0.0158	1.83955E-05
106	0.501298	0.4987	0.000580539	0.912	0.0144	8.3661E-06
107	0.542284	0.4577	0.000265722	0.912	0.0131	3.49213E-06
108	0.586516	0.4135	0.000109872	0.912	0.012	1.3168E-06
109	0.634244	0.3658	4.01863E-05	0.912	0.0109	4.39222E-07
110	0.685737	0.3143	1.26291E-05	0.912	0.01	1.25878E-07
111	0.741283	0.2587	3.26735E-06	0.912	0.0091	2.96993E-08
112	0.801191	0.1988	6.49579E-07	0.912	0.0083	5.3846E-09
113	0.865795	0.1342	8.71768E-08	0.912	0.0076	6.59012E-10
114	0.935453	0.0645	5.627E-09	0.912	0.0069	3.87919E-11
115	0.985796	0.0142	7.99259E-11	0.912	0.0063	5.02485E-13

Calculation of contribution amount:

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	9.66%
1+i		PwC Analysis	1.10
International poverty line	USD	WB	1.90
Exchange rate	BDT	Bangladesh Bank	84.91
Annual income of a person at poverty line	BDT	HIES 2016	58,885.09
Temporary annuity payable annually in arrears for 13 year	BDT	PwC Analysis	6.57
Whole life annuity payable annually in arrears	BDT	PwC Analysis	7.93
Deferred annuity	BDT	PwC Analysis	1.36
Assured annuity for 13 years	BDT	PwC Analysis	7.23
Guaranteed annuity	BDT	PwC Analysis	8.59
Temporary annuity payable in arrears	BDT	PwC Analysis	9.65
Discounting factor		PwC Analysis	0.05
Yearly contribution amount	BDT	PwC Analysis	2,407.72
Daily contribution amount	BDT	PwC Analysis	6.60

Other Calculation

%age of popn					0.68	
%age of formal popn to total popn					0.05	
	Units	Data Source	2019-20	2020-21	2021-22	2022-23
Working age population			113780000	114960000	116150000	117350000
Total population			168310000	170060000	171820000	173600000
Total cost	BDT		2.7395E+11	2.87648E+11	3.0203E+11	3.17131E+11
Total cost to be paid by state	BDT		2.46555E+11	2.58883E+11	2.71827E+11	2.85418E+11
Number of Formal employees			8910000	9050000.00	9190000	9330000
Total cost in USD	USD		3287401201	3451771261	3624359824	3805577815

Legends:

px	Probability that an individual aged x is alive at x+1
tpx	Probability that an individual aged x is alive x+t
v	Discount factor for an assured annuity
t	Time period, in integers

Tier 1 (up to 60 years)

Age(x)	Mortality rate(qx)	px	tpx	v	v ^t	v ^t *tpx	v ^t v'	v ^t	v ^t *tpx
28	0.001017	0.999							
29	0.001034	0.999	0.999	0.912	0.912	0.911	0.958	0.958	0.957
30	0.001056	0.999	0.998	0.912	0.832	0.83	0.958	0.917	0.915
31	0.001084	0.999	0.997	0.912	0.758	0.756	0.958	0.878	0.875
32	0.001119	0.999	0.996	0.912	0.692	0.689	0.958	0.841	0.837
33	0.001164	0.999	0.995	0.912	0.631	0.627	0.958	0.805	0.801
34	0.001218	0.999	0.993	0.912	0.575	0.571	0.958	0.771	0.766
35	0.001282	0.999	0.992	0.912	0.525	0.52	0.958	0.738	0.732
36	0.001358	0.999	0.991	0.912	0.478	0.474	0.958	0.707	0.7
37	0.001447	0.999	0.989	0.912	0.436	0.432	0.958	0.677	0.67
38	0.001549	0.998	0.988	0.912	0.398	0.393	0.958	0.648	0.64
39	0.001667	0.998	0.986	0.912	0.363	0.358	0.958	0.621	0.612
40	0.001803	0.998	0.984	0.912	0.331	0.326	0.958	0.594	0.585
41	0.001959	0.998	0.982	0.912	0.302	0.296	0.958	0.569	0.559
42	0.00214	0.998	0.98	0.912	0.275	0.27	0.958	0.545	0.534
43	0.00235	0.998	0.978	0.912	0.251	0.245	0.958	0.522	0.51
44	0.002593	0.997	0.975	0.912	0.229	0.223	0.958	0.5	0.487
45	0.002874	0.997	0.973	0.912	0.209	0.203	0.958	0.478	0.465
46	0.003197	0.997	0.97	0.912	0.19	0.185	0.958	0.458	0.444
47	0.003567	0.996	0.966	0.912	0.174	0.168	0.958	0.439	0.424
48	0.003983	0.996	0.962	0.912	0.158	0.152	0.958	0.42	0.404
49	0.004444	0.996	0.958	0.912	0.144	0.138	0.958	0.402	0.385
50	0.004946	0.995	0.953	0.912	0.132	0.125	0.958	0.385	0.367
51	0.005483	0.995	0.948	0.912	0.12	0.114	0.958	0.369	0.35
52	0.006051	0.994	0.942	0.912	0.109	0.103	0.958	0.353	0.333
53	0.006643	0.993	0.936	0.912	0.1	0.093	0.958	0.338	0.316
54	0.007256	0.993	0.929	0.912	0.091	0.085	0.958	0.324	0.301
55	0.007888	0.992	0.922	0.912	0.083	0.077	0.958	0.31	0.286
56	0.008543	0.991	0.914	0.912	0.076	0.069	0.958	0.297	0.271
57	0.009225	0.991	0.906	0.912	0.069	0.063	0.958	0.284	0.257
58	0.009944	0.99	0.897	0.912	0.063	0.056	0.958	0.272	0.244
59	0.010709	0.989	0.887	0.912	0.057	0.051	0.958	0.261	0.231
60	0.011534	0.988	0.877	0.912	0.052	0.046	0.958	0.25	0.219

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	9.66%
Temporary annuity payable in arrears	BDT	PwC Analysis	9.6494011
Temporary annuity increasing in arrears	BDT	PwC Analysis	15.692426

Legends:	
px	Probability that an individual aged x is alive at x+1
tpx	Probability that an individual aged x is alive x+t
v	Discount factor for an assured annuity
t	Time period, in Integers
v'	Modified discount factor for an assured annuity

Tier 1 (60 years to life) – scenario 1

Age(x)	Mortality rate(px)	tpx	v	v ^t	v ^t	v ^t	v ^t	v ^t tpx	v ^t tpx
60	0.011534	0.9885							
61	0.012431	0.9876	0.987569	0.912	0.912	0.9575	0.9575	0.900614655	0.945645388
62	0.013414	0.9866	0.974321749	0.912	0.8317	0.9575	0.9169	0.810299403	0.893355092
63	0.014497	0.9855	0.960197007	0.912	0.7584	0.9575	0.878	0.728240839	0.843029802
64	0.015691	0.9843	0.945130556	0.912	0.6916	0.9575	0.8407	0.653699341	0.794575634
65	0.017009	0.983	0.92905483	0.912	0.6308	0.9575	0.805	0.586002069	0.747903636
66	0.018462	0.9815	0.91190262	0.912	0.5752	0.9575	0.7708	0.524539053	0.702932499
67	0.020061	0.9799	0.893608941	0.912	0.5246	0.9575	0.7381	0.468757718	0.659589183
68	0.021819	0.9782	0.874111288	0.912	0.4784	0.9575	0.7068	0.418156849	0.617808113
69	0.023746	0.9763	0.853354641	0.912	0.4363	0.9575	0.6768	0.37228334	0.57753365
70	0.025855	0.9741	0.831291157	0.912	0.3978	0.9575	0.6481	0.330726328	0.538718338
71	0.028159	0.9718	0.807882829	0.912	0.3628	0.9575	0.6205	0.293113314	0.501323238
72	0.030673	0.9693	0.783102639	0.912	0.3309	0.9575	0.5942	0.259105968	0.465317092
73	0.033412	0.9666	0.756937614	0.912	0.3017	0.9575	0.569	0.22839699	0.430676589
74	0.036394	0.9636	0.729389626	0.912	0.2752	0.9575	0.5448	0.200706498	0.397385137
75	0.039637	0.9604	0.70047881	0.912	0.2509	0.9575	0.5217	0.175779576	0.365433115
76	0.043162	0.9568	0.670244743	0.912	0.2288	0.9575	0.4995	0.15338341	0.334816748
77	0.046991	0.953	0.638749273	0.912	0.2087	0.9575	0.4783	0.133305157	0.305537862
78	0.051149	0.9489	0.606077886	0.912	0.1903	0.9575	0.458	0.115349717	0.277602847
79	0.055662	0.9443	0.572342379	0.912	0.1736	0.9575	0.4386	0.099338034	0.251022263
80	0.060558	0.9394	0.537682469	0.912	0.1583	0.9575	0.42	0.085105395	0.225809949
81	0.06587	0.9341	0.502265325	0.912	0.1443	0.9575	0.4021	0.07249966	0.201981342
82	0.07163	0.9284	0.46628806	0.912	0.1316	0.9575	0.3851	0.061380247	0.179553225
83	0.077876	0.9221	0.429975411	0.912	0.12	0.9575	0.3687	0.051616615	0.158541658
84	0.084645	0.9154	0.393580142	0.912	0.1095	0.9575	0.3531	0.043087435	0.138961283
85	0.091982	0.908	0.357377863	0.912	0.0998	0.9575	0.3381	0.035679327	0.120822866
86	0.09993	0.9001	0.321665085	0.912	0.091	0.9575	0.3237	0.0292863	0.104132496
87	0.10854	0.8915	0.286751556	0.912	0.083	0.9575	0.31	0.023808823	0.0888892
88	0.117866	0.8821	0.252953297	0.912	0.0757	0.9575	0.2968	0.019153319	0.075083485
89	0.127963	0.872	0.220584635	0.912	0.0691	0.9575	0.2842	0.015231775	0.062696052
90	0.138895	0.8611	0.189946532	0.912	0.063	0.9575	0.2722	0.011961295	0.051696026
91	0.150727	0.8493	0.161316461	0.912	0.0574	0.9575	0.2606	0.009263968	0.042040255
92	0.163532	0.8365	0.134936057	0.912	0.0524	0.9575	0.2495	0.00706721	0.033672513
93	0.177387	0.8226	0.111000155	0.912	0.0478	0.9575	0.239	0.005301333	0.026523569
94	0.192374	0.8076	0.089646611	0.912	0.0436	0.9575	0.2288	0.003904514	0.020511769
95	0.208585	0.7914	0.070947673	0.912	0.0397	0.9575	0.2191	0.002818012	0.015544195
96	0.226114	0.7739	0.054905411	0.912	0.0362	0.9575	0.2098	0.001988801	0.01151877
97	0.245067	0.7549	0.041449906	0.912	0.033	0.9575	0.2009	0.001369214	0.008326747
98	0.265555	0.7344	0.030442677	0.912	0.0301	0.9575	0.1924	0.000917069	0.005855925
99	0.287699	0.7123	0.021684349	0.912	0.0275	0.9575	0.1842	0.000595713	0.003994109
100	0.311628	0.6884	0.014926899	0.912	0.0251	0.9575	0.1764	0.000373966	0.002632716
101	0.337482	0.6625	0.009889339	0.912	0.0228	0.9575	0.1689	0.000225944	0.001670177
102	0.365411	0.6346	0.006275666	0.912	0.0208	0.9575	0.1617	0.000130757	0.001014883
103	0.395577	0.6044	0.003793157	0.912	0.019	0.9575	0.1549	7.20739E-05	0.000587378
104	0.428153	0.5718	0.002169105	0.912	0.0173	0.9575	0.1483	3.75863E-05	0.000321631
105	0.463327	0.5367	0.0011641	0.912	0.0158	0.9575	0.142	1.83955E-05	0.000165283
106	0.501298	0.4987	0.000580539	0.912	0.0144	0.9575	0.136	8.3661E-06	7.8928E-05
107	0.542284	0.4577	0.000265722	0.912	0.0131	0.9575	0.1302	3.49213E-06	3.4593E-05
108	0.586516	0.4135	0.000109872	0.912	0.012	0.9575	0.1247	1.3168E-06	1.36964E-05
109	0.634244	0.3658	4.01863E-05	0.912	0.0109	0.9575	0.1194	4.39222E-07	4.79680E-06
110	0.685737	0.3143	1.26291E-05	0.912	0.01	0.9575	0.1143	1.25878E-07	1.44340E-06
111	0.741283	0.2587	3.26735E-06	0.912	0.0091	0.9575	0.1094	2.96909E-08	3.57602E-07
112	0.801191	0.1988	6.49579E-07	0.912	0.0083	0.9575	0.1048	5.3846E-09	6.80764E-08
113	0.865795	0.1342	8.71768E-08	0.912	0.0076	0.9575	0.1004	6.59012E-10	8.74835E-09
114	0.935453	0.0645	5.627E-09	0.912	0.0069	0.9575	0.0961	3.87919E-11	5.40709E-10
115	0.985796	0.0142	7.99259E-11	0.912	0.0063	0.9575	0.092	5.02485E-13	7.35419E-12

Calculation of Contribution:

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	0.09655
i+1			1.09655
Monthly average income	BDT		16424
Rate of growth of income			0.05
Annual income	BDT		197088
Annual salary after growth at age 60	BDT		939112.7842
Discounting factor			0.045915677
Modified interest rate (i')			0.044333333
Temporary increasing annuity payable in arrears at age 28	BDT		15.69242623
Guaranteed annuity	BDT	PwC Analysis	8.5928968
Temporary annuity payable in arrears	BDT	PwC Analysis	9.6494011
Contribution amount in 1st year	BDT		23,611.75
% of current income			0.119803101
Contribution by employee			5.99%
Contribution by employer			5.99%

Other Calculation:

	2019-20	2020-21	2021-22	2022-23
Formal sector popn		8910000	9050000	9190000
Total corpus value	BDT	2.10381E+11	224.370.688.110.77	2.39234E+11
Total corpus value	USD	2524568690	2692448257	2870804360
3060264953				
Legends:				
px	Probability that an individual aged x is alive at x+1			
tpx	Probability that an individual aged x is alive at x+t			
v	Discount factor for an assured annuity			
t	Time period, in Integers			
v'	Modified discount factor for an assured annuity			

Tier 1 (60 years to life)- scenario 2

Age(x)	Mortality rate(qx)	px	tpx	v	v ^t	v ^t *tpx
60	0.011534	0.9885				
61	0.012431	0.9876	0.9876	0.912	0.912	0.9006
62	0.013414	0.9866	0.9743	0.912	0.8317	0.8103
63	0.014497	0.9855	0.9602	0.912	0.7584	0.7282
64	0.015691	0.9843	0.9451	0.912	0.6916	0.6537
65	0.017009	0.983	0.9291	0.912	0.6308	0.586
66	0.018462	0.9815	0.9119	0.912	0.5752	0.5245
67	0.020061	0.9799	0.8936	0.912	0.5246	0.4688
68	0.021819	0.9782	0.8741	0.912	0.4784	0.4182
69	0.023746	0.9763	0.8534	0.912	0.4363	0.3723
70	0.025855	0.9741	0.8313	0.912	0.3978	0.3307
71	0.028159	0.9718	0.8079	0.912	0.3628	0.2931
72	0.030673	0.9693	0.7831	0.912	0.3309	0.2591
73	0.033412	0.9666	0.7569	0.912	0.3017	0.2284
74	0.036394	0.9636	0.7294	0.912	0.2752	0.2007
75	0.039637	0.9604	0.7005	0.912	0.2509	0.1758
76	0.043162	0.9568	0.6702	0.912	0.2288	0.1534
77	0.046991	0.953	0.6387	0.912	0.2087	0.1333
78	0.051149	0.9489	0.6061	0.912	0.1903	0.1153
79	0.055662	0.9443	0.5723	0.912	0.1736	0.0993
80	0.060558	0.9394	0.5377	0.912	0.1583	0.0851
81	0.06587	0.9341	0.5023	0.912	0.1443	0.0725
82	0.07163	0.9284	0.4663	0.912	0.1316	0.0614
83	0.077876	0.9221	0.43	0.912	0.12	0.0516
84	0.084645	0.9154	0.3936	0.912	0.1095	0.0431
85	0.091982	0.908	0.3574	0.912	0.0998	0.0357
86	0.09993	0.9001	0.3217	0.912	0.091	0.0293
87	0.10854	0.8915	0.2868	0.912	0.083	0.0238
88	0.117866	0.8821	0.253	0.912	0.0757	0.0192
89	0.127963	0.872	0.2206	0.912	0.0691	0.0152
90	0.138895	0.8611	0.1899	0.912	0.063	0.012
91	0.150727	0.8493	0.1613	0.912	0.0574	0.0093
92	0.163532	0.8365	0.1349	0.912	0.0524	0.0071
93	0.177387	0.8226	0.111	0.912	0.0478	0.0053
94	0.192374	0.8076	0.0896	0.912	0.0436	0.0039
95	0.208585	0.7914	0.0709	0.912	0.0397	0.0028
96	0.226114	0.7739	0.0549	0.912	0.0362	0.002
97	0.245067	0.7549	0.0414	0.912	0.033	0.0014
98	0.265555	0.7344	0.0304	0.912	0.0301	0.0009
99	0.287699	0.7123	0.0217	0.912	0.0275	0.0006
100	0.311628	0.6884	0.0149	0.912	0.0251	0.0004
101	0.337482	0.6625	0.0099	0.912	0.0228	0.0002
102	0.365411	0.6346	0.0063	0.912	0.0208	0.0001
103	0.395577	0.6044	0.0038	0.912	0.019	7E-05
104	0.428153	0.5718	0.0022	0.912	0.0173	4E-05
105	0.463327	0.5367	0.0012	0.912	0.0158	2E-05
106	0.501298	0.4987	0.0006	0.912	0.0144	8E-06
107	0.542284	0.4577	0.0003	0.912	0.0131	3E-06
108	0.586516	0.4135	0.0001	0.912	0.012	1E-06
109	0.634244	0.3658	4E-05	0.912	0.0109	4E-07
110	0.685737	0.3143	1E-05	0.912	0.01	1E-07
111	0.741283	0.2587	3E-06	0.912	0.0091	3E-08
112	0.801191	0.1988	6E-07	0.912	0.0083	5E-09
113	0.865795	0.1342	9E-08	0.912	0.0076	7E-10
114	0.935453	0.0645	6E-09	0.912	0.0069	4E-11
115	0.985796	0.0142	8E-11	0.912	0.0063	5E-13

Calculation of contribution amount:

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	9.655%
1+i		PwC Analysis	1.09655
Contribution percentage			10%
Monthly average income	BDT	HIES 2016	16,424.00
Annual income of a person at poverty line	BDT		197,088.00
Temporary annuity payable annually in arrears for 13 years	BDT	PwC Analysis	6.57
Whole life annuity payable annually in arrears	BDT	PwC Analysis	7.93
Deferred annuity	BDT	PwC Analysis	1.36
Assured annuity for 13 years	BDT	PwC Analysis	7.23
Guaranteed annuity	BDT	PwC Analysis	8.59
Temporary annuity payable in arrears	BDT	PwC Analysis	9.65
Discounting factor		PwC Analysis	0.04592
Yearly contribution amount	BDT	PwC Analysis	19,708.80
Pension received annually	BDT	PwC Analysis	482,014.34
Pension received monthly	BDT	PwC Analysis	40,167.86

Other Calculation:

		2019-20	2020-21	2021-22	2022-23
Formal sector popn		8910000	9050000	9190000	9330000
Total corpus value	BDT	1.75605E+11	1.78365E+11	1.8112E+11	1.83883E+11
Total corpus value	USD	2107264896	2140375680	2173486464	2206597248
Legends:					
px	Probability that an individual aged x is alive at x+1				
tpx	Probability that an individual aged x is alive x+t				
v	Discount factor for an assured annuity				
t	Time period, in Integers				

Tier 1 (up to 60 years)- scenario 3

Age(x)	Mortality rate(qx)	px	tpx	v	v^t	v^t*tpx	v'	v'^t	v'^t*tpx
28	0.001017	0.999							
29	0.001034	0.999	0.999	0.912	0.912	0.911	0.9302	0.9302	0.9292
30	0.001056	0.9989	0.9979	0.912	0.8317	0.8299	0.9302	0.8653	0.8634
31	0.001084	0.9989	0.9968	0.912	0.7584	0.756	0.9302	0.8049	0.8023
32	0.001119	0.9989	0.9957	0.912	0.6916	0.6887	0.9302	0.7487	0.7455
33	0.001164	0.9988	0.9946	0.912	0.6308	0.6273	0.9302	0.6964	0.6926
34	0.001218	0.9988	0.9933	0.912	0.5752	0.5714	0.9302	0.6478	0.6435
35	0.001282	0.9987	0.9921	0.912	0.5246	0.5204	0.9302	0.6026	0.5978
36	0.001358	0.9986	0.9907	0.912	0.4784	0.4739	0.9302	0.5605	0.5553
37	0.001447	0.9986	0.9893	0.912	0.4363	0.4316	0.9302	0.5214	0.5158
38	0.001549	0.9985	0.9878	0.912	0.3978	0.393	0.9302	0.485	0.479
39	0.001667	0.9983	0.9861	0.912	0.3628	0.3578	0.9302	0.4511	0.4449
40	0.001803	0.9982	0.9843	0.912	0.3309	0.3257	0.9302	0.4196	0.413
41	0.001959	0.998	0.9824	0.912	0.3017	0.2964	0.9302	0.3903	0.3835
42	0.00214	0.9979	0.9803	0.912	0.2752	0.2698	0.9302	0.3631	0.3559
43	0.00235	0.9977	0.978	0.912	0.2509	0.2454	0.9302	0.3377	0.3303
44	0.002593	0.9974	0.9755	0.912	0.2288	0.2232	0.9302	0.3142	0.3064
45	0.002874	0.9971	0.9727	0.912	0.2087	0.203	0.9302	0.2922	0.2842
46	0.003197	0.9968	0.9695	0.912	0.1903	0.1845	0.9302	0.2718	0.2635
47	0.003567	0.9964	0.9661	0.912	0.1736	0.1677	0.9302	0.2528	0.2443
48	0.003983	0.996	0.9622	0.912	0.1583	0.1523	0.9302	0.2352	0.2263
49	0.004444	0.9956	0.958	0.912	0.1443	0.1383	0.9302	0.2188	0.2096
50	0.004946	0.9951	0.9532	0.912	0.1316	0.1255	0.9302	0.2035	0.194
51	0.005483	0.9945	0.948	0.912	0.12	0.1138	0.9302	0.1893	0.1795
52	0.006051	0.9939	0.9423	0.912	0.1095	0.1032	0.9302	0.1761	0.1659
53	0.006643	0.9934	0.936	0.912	0.0998	0.0934	0.9302	0.1638	0.1533
54	0.007256	0.9927	0.9292	0.912	0.091	0.0846	0.9302	0.1524	0.1416
55	0.007888	0.9921	0.9219	0.912	0.083	0.0765	0.9302	0.1417	0.1307
56	0.008543	0.9915	0.914	0.912	0.0757	0.0692	0.9302	0.1318	0.1205
57	0.009225	0.9908	0.9056	0.912	0.0691	0.0625	0.9302	0.1226	0.111
58	0.009944	0.9901	0.8966	0.912	0.063	0.0565	0.9302	0.1141	0.1023
59	0.010709	0.9893	0.887	0.912	0.0574	0.0509	0.9302	0.1061	0.0941
60	0.011534	0.9885	0.8767	0.912	0.0524	0.0459	0.9302	0.0987	0.0865

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	9.66%
Temporary annuity payable in arrears	BDT	PwC Analysis	9.64940105
Temporary annuity increasing in arrears	BDT	PwC Analysis	11.5350614

Legends:	
px	Probability that an individual aged x is alive at x+1
tpx	Probability that an individual aged x is alive x+t
v	Discount factor for an assured annuity
t	Time period, in Integers
v'	Modified discount factor for an assured annuity

Tier 1 (60 years to life)- scenario 3

Age(x)	Mortality rate	px	tpx	v	v ^t	v'	v' ^t	v ^t *tpx	v' ^t *tpx
60	0.011534	0.9885							
61	0.012431	0.9876	0.987569	0.912	0.912	0.9302	0.9302	0.900614655	0.918626948
62	0.013414	0.9866	0.974321749	0.912	0.8317	0.9302	0.8653	0.810299403	0.843035499
63	0.014497	0.9855	0.960197007	0.912	0.7584	0.9302	0.8049	0.728240839	0.772815005
64	0.015691	0.9843	0.945130566	0.912	0.6916	0.9302	0.7487	0.653699341	0.70738519
65	0.017009	0.983	0.92995483	0.912	0.6308	0.9302	0.6964	0.586002069	0.646993635
66	0.018462	0.9815	0.91190262	0.912	0.5752	0.9302	0.6478	0.524539053	0.590716169
67	0.020061	0.9799	0.893608941	0.912	0.5246	0.9302	0.6026	0.468757718	0.538455272
68	0.021819	0.9782	0.874111288	0.912	0.4784	0.9302	0.5605	0.418156849	0.489937395
69	0.023746	0.9763	0.853354641	0.912	0.4363	0.9302	0.5214	0.37228334	0.444913053
70	0.025855	0.9741	0.831291157	0.912	0.3978	0.9302	0.485	0.330726328	0.403153548
71	0.028159	0.9718	0.807882829	0.912	0.3628	0.9302	0.4511	0.293113314	0.364449565
72	0.030673	0.9693	0.783102639	0.912	0.3309	0.9302	0.4196	0.259105968	0.328609018
73	0.033412	0.9666	0.756937614	0.912	0.3017	0.9302	0.3903	0.22839699	0.295455861
74	0.036394	0.9636	0.729389626	0.912	0.2752	0.9302	0.3631	0.200706498	0.264827962
75	0.039637	0.9604	0.70047881	0.912	0.2509	0.9302	0.3377	0.175779576	0.236571666
76	0.043162	0.9568	0.670244743	0.912	0.2288	0.9302	0.3142	0.15338341	0.210562553
77	0.046991	0.953	0.638749273	0.912	0.2087	0.9302	0.2922	0.133305157	0.186659493
78	0.051149	0.9489	0.606077886	0.912	0.1903	0.9302	0.2718	0.115349717	0.1647478
79	0.055662	0.9443	0.572342379	0.912	0.1736	0.9302	0.2528	0.099338034	0.144716757
80	0.060558	0.9394	0.537682469	0.912	0.1583	0.9302	0.2352	0.085105395	0.12646214
81	0.06587	0.9341	0.502265325	0.912	0.1443	0.9302	0.2188	0.07249966	0.109885295
82	0.07163	0.9284	0.46628806	0.912	0.1316	0.9302	0.2035	0.061380247	0.094892614
83	0.077876	0.9221	0.429975411	0.912	0.12	0.9302	0.1893	0.051616615	0.081394202
84	0.084645	0.9154	0.393580142	0.912	0.1095	0.9302	0.1761	0.043087435	0.069303435
85	0.091982	0.908	0.357377863	0.912	0.0998	0.9302	0.1638	0.035679327	0.058535718
86	0.09993	0.9001	0.321665085	0.912	0.091	0.9302	0.1524	0.0292863	0.049008224
87	0.10854	0.8915	0.286751556	0.912	0.083	0.9302	0.1417	0.023808823	0.040638958
88	0.117866	0.8821	0.252953297	0.912	0.0757	0.9302	0.1318	0.019153319	0.033346392
89	0.127963	0.872	0.220584635	0.912	0.0691	0.9302	0.1226	0.015231775	0.027049267
90	0.138895	0.8611	0.189946532	0.912	0.063	0.9302	0.1141	0.011961295	0.02166623
91	0.150727	0.8493	0.161316461	0.912	0.0574	0.9302	0.1061	0.009263968	0.017116005
92	0.163532	0.8365	0.134936057	0.912	0.0524	0.9302	0.0987	0.007066721	0.013317523
93	0.177387	0.8226	0.111000155	0.912	0.0478	0.9302	0.0918	0.005301333	0.010190389
94	0.192374	0.8076	0.089646611	0.912	0.0436	0.9302	0.0854	0.003904514	0.007655486
95	0.208585	0.7914	0.070947673	0.912	0.0397	0.9302	0.0794	0.002818012	0.005635712
96	0.226114	0.7739	0.054905411	0.912	0.0362	0.9302	0.0739	0.001988801	0.00405693
97	0.245067	0.7549	0.041449906	0.912	0.033	0.9302	0.0687	0.001369214	0.002848903
98	0.265555	0.7344	0.030442677	0.912	0.0301	0.9302	0.0639	0.000917069	0.001946295
99	0.287699	0.7123	0.021684349	0.912	0.0275	0.9302	0.0595	0.000595713	0.001289567
100	0.311628	0.6884	0.014926899	0.912	0.0251	0.9302	0.0553	0.000373966	0.000825732
101	0.337482	0.6625	0.009889339	0.912	0.0228	0.9302	0.0515	0.000225944	0.000508872
102	0.365411	0.6346	0.006275666	0.912	0.0208	0.9302	0.0479	0.000130757	0.000300381
103	0.395577	0.6044	0.003793157	0.912	0.019	0.9302	0.0445	7.20739E-05	0.000168883
104	0.428153	0.5718	0.002169105	0.912	0.0173	0.9302	0.0414	3.75863E-05	8.98332E-05
105	0.463327	0.5367	0.0011641	0.912	0.0158	0.9302	0.0385	1.83955E-05	4.48454E-05
106	0.501298	0.4987	0.000580539	0.912	0.0144	0.9302	0.0358	8.3661E-06	2.08032E-05
107	0.542284	0.4577	0.000265722	0.912	0.0131	0.9302	0.0333	3.49213E-06	8.57225E-06
108	0.586516	0.4135	0.000109872	0.912	0.012	0.9302	0.031	1.3168E-06	3.40667E-06
109	0.634244	0.3658	4.01863E-05	0.912	0.0109	0.9302	0.0288	4.39222E-07	1.15002E-06
110	0.685737	0.3143	1.26291E-05	0.912	0.01	0.9302	0.0268	1.25878E-07	3.38811E-07
111	0.741283	0.2587	3.26735E-06	0.912	0.0091	0.9302	0.025	2.96993E-08	8.15360E-08
112	0.801191	0.1988	6.49579E-07	0.912	0.0083	0.9302	0.0232	5.3546E-09	1.50786E-08
113	0.865795	0.1342	8.71768E-08	0.912	0.0076	0.9302	0.0216	6.59012E-10	1.88236E-09
114	0.935453	0.0645	5.627E-09	0.912	0.0069	0.9302	0.0201	3.87919E-11	1.13019E-10
115	0.985796	0.0142	7.99259E-11	0.912	0.0063	0.9302	0.0187	5.02485E-13	1.49325E-12

Calculation of Contribution:

	Units	Data Source	FY 20-21
Interest rate (i)		Bangladesh Bank	0.09655
i+1			1.09655
Monthly average income	BDT		16424
Rate of growth of income			0.02
Annual income	BDT		197088
Annual salary after growth at age 60	BDT		371420.3362
Contribution rate			0.1
Discounting factor			0.045915677
Modified interest rate (i')			0.07504902
Temporary increasing annuity payable in arrears at age 28	BDT		11.5350614
Temporary annuity payable annually in arrears for	BDT	PwC Analysis	6.57
Whole life annuity payable annually in arrears	BDT	PwC Analysis	7.93
Deferred annuity	BDT	PwC Analysis	1.36
Assured annuity for 13 years	BDT	PwC Analysis	7.23
Guaranteed annuity	BDT	PwC Analysis	8.59
Contribution amount			19708.8
Pension received annually	BDT		576,208.30
Pension received monthly	BDT		48,017.36

Other Calculation:

		2019-20	2020-21	2021-22	2022-23
Formal sector popn			8910000	9050000	9190000
Total corpus value	BDT		1.75605E+11	1.81932E+11	1.84746E+11
Total corpus value	USD		2107264896	2183183194	2216956193

Legends:

px	Probability that an individual aged x is alive at x+1
tpx	Probability that an individual aged x is alive x+t
v	Discount factor for an assured annuity
t	Time period, in Integers
v'	Modified discount factor for an assured annuity



Social Security Policy Support (SSPS) Programme
Cabinet Division
and
General Economics Division (GED) of Bangladesh
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