

# Departmental retreat: Employment Policy Department

Employment Impact Assessment  
Methodologies:  
From Input – Output to DySAM

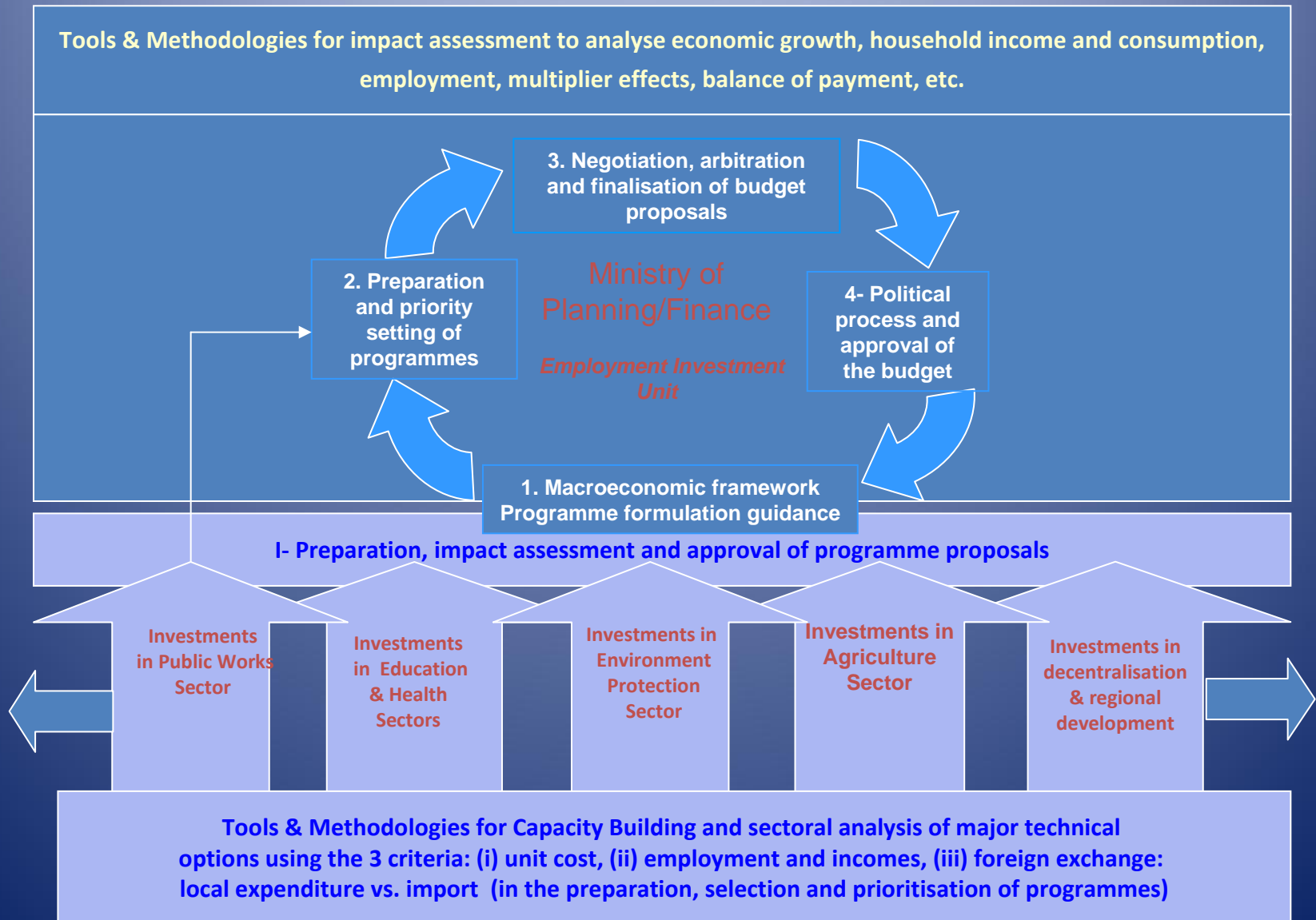


15 September 2010



# Integration of Employment in Public Investment Programmes in Infrastructure

## PROGRAMMING AND BUDGETING PROCESS





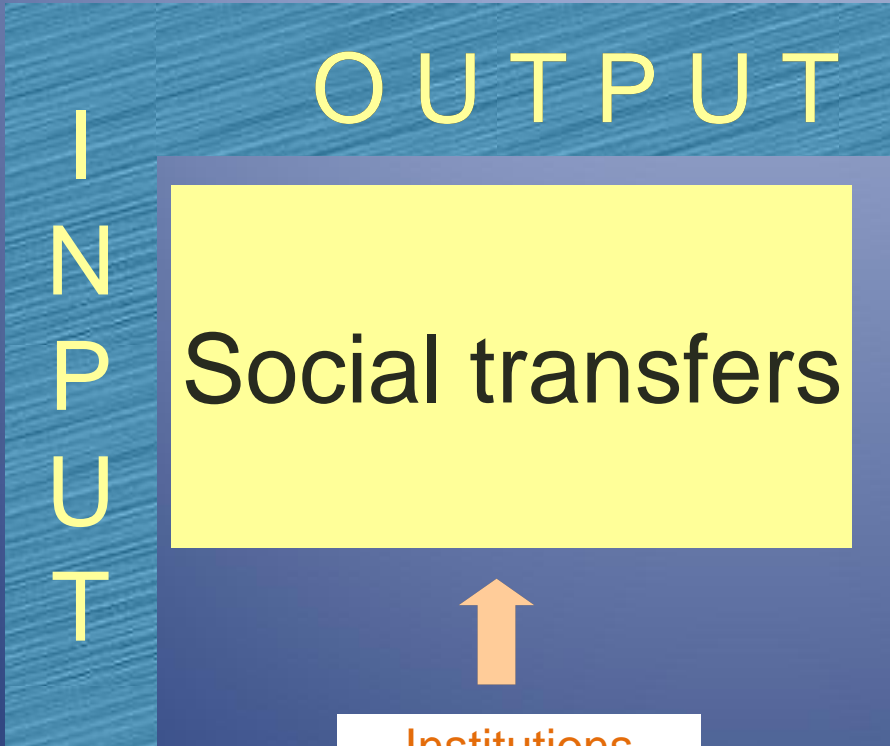
# Evolution



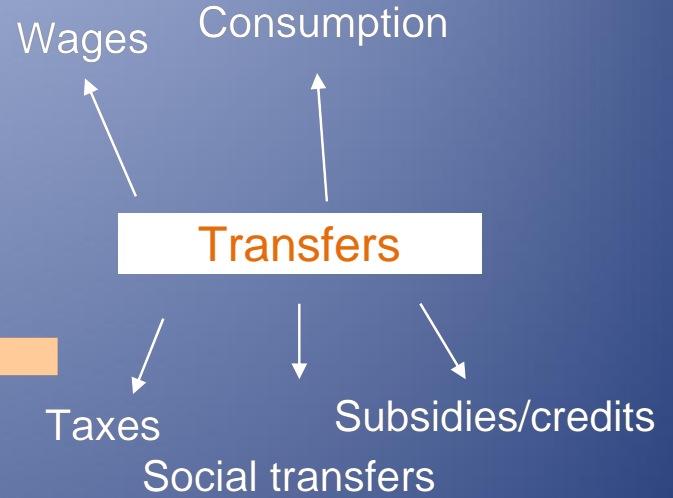
- The (Dy)SAM is the result of a natural evolution of analytical EIA tools developed and used by Emp/Invest during the last 30 years
- It is based and adds up on previous used tools, which have shown their effectiveness, but also certain limitations the (Dy)SAM intends to overcome

# SAM

Production



Social transfers

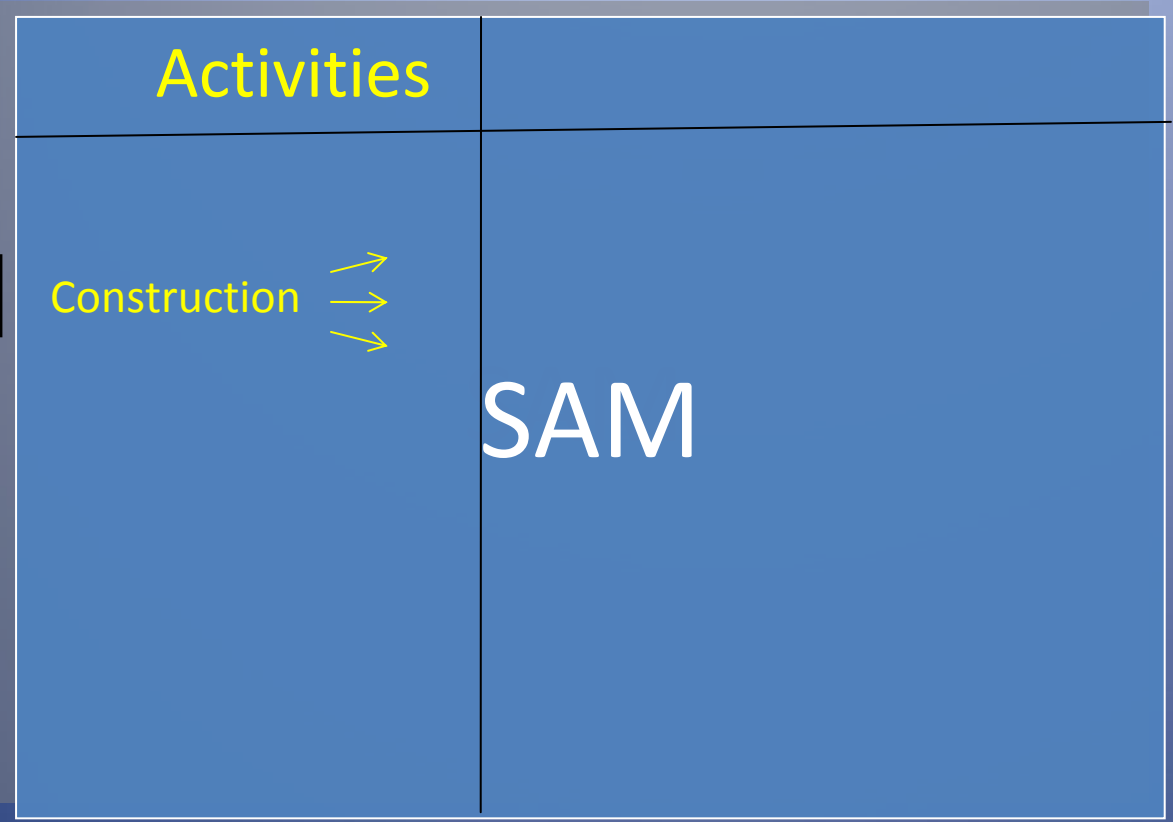


Institutions

Enterprises    Households    Government

# Expanded and extended SAM

Expansion

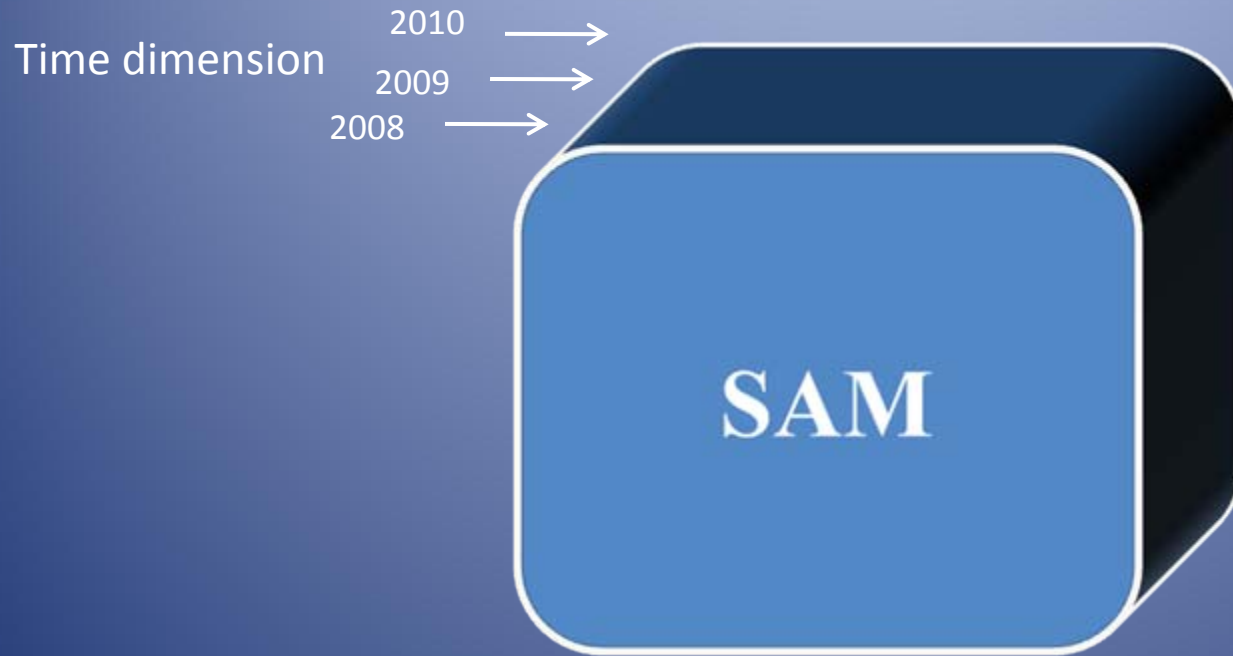


Monetary values

Employment satellite

Real values

# DYSAM



↓

Static: One specific year



# Dynamic SAM



- Static SAM: Snapshot of the economy
- Dynamic SAM: consistent evolution of the economic structure over time (incl. income and techn. coefficients)
- To create a dynamic SAM, need for forward-looking projections of key macro & financial variables, derived from macro SAM and flow-of-funds

# What is the outcome of it?

Impact analysis of:

on targets:

- Public investment:  
e.g. infrastructure
- Social transfers/prot.
- Private investment
- Sectors/sect. policies

Ex ante



Ex post

Workers

- Formal/informal
- Rural/Urban
- Gender/youth
- Skill level
- Green jobs

Households

- Decile/quintile
- Rural/urban
- Heads of HH
- Gender

Direct, indirect and induced employment effect



# Who will use the DySAM ?

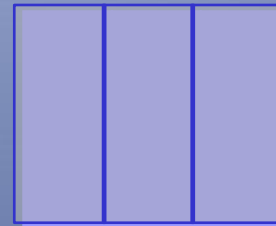
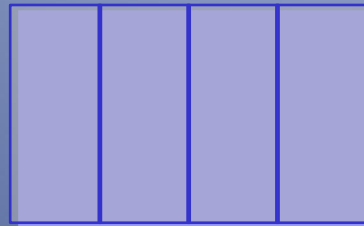


- **CMEA**: Infrastructure investment
- **Public Works**: Construction satellite account
- **Finances**: Climate change/green jobs
- **Planning**: Climate change, growth and employment (youth emp)
- **Bank of Indonesia**: Climate change & remittances (social fin.)
- **Manpower**: FDI and employment
- **BPS**: Hosting and up-dating DySAM
- **ILO projects**: Trade and employment, green jobs
- Proposals on **regional DySAMs**
- **UNWTO**: Tourism satellite account

# Conclusion



- It can do a lot, but not all  
macro, meso, micro e.g. monet. policy, project monitoring
- Helpful analytical tool for policy advise:
  - Evaluation of effectiveness of past policies
  - Decision-making on future policies & mix of policies
  - Targeting of specific groups (of workers) or indicators (e.g. MDG)
  - Bring employment considerations into decision-making process of various Ministries
  - Potential for Social Dialogue
- Way forward: Extension & expansion
  - ✓ Issues: technological change, green jobs/climate change, social protection, sectoral disaggregation
  - ✓ Method: Provincial/local DySAMs, dynamic investment
  - ✓ Training: ILO staff, local constituents, trainers of trainer



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# Additional material

# Comparative Table

	Static SAM	DySAM
<b>Method</b>	Deman-driven multiplier framework on accounting platform (input-output + social transfer)	SAM+ time series (dynamique), some behaviours
<b>Data required</b>	high: SNA, FoF, LFS, HS	very high: same as static SAM + time series for macro variables
<b>Level of analysis</b>	Macro-meso-micro + interlinkages	Macro-meso-micro + interlinkages
<b>Applicability</b>	Expost impact evaluation, exante simulation: public investment, spending, policies, exogenous shocks	Expost impact evaluation, exante simulation: public investment, spending, policies, exogenous shocks
<b>Inputs required</b>	Data, skilled staff, simple software + hardware	Data, skilled staff, dynamic software
<b>Costs Construction</b>	1-3 w/m international, 3-5 w/m national consultant	2-6 w/m international, 4-7 w/m national consultant
<b>Period implementation</b>	Construction: 1-6 months, Training: 2 days-4 weeks	Construction: 1 1/2-6 months, Training: 2 days-4 weeks
<b>Strengths</b>	full socio-economic circle, micro-meso-macro, techno choices, employment account	SAM+ dynamic + some behaviours
<b>Weaknesses</b>	Technical coefficient fix, strong assumptions	Data and skill requirements, still fixed prices
<b>Challenges</b>	Starting costs: Financial resources + national commitment	Starting costs: Financial resources + national commitment



- Matrix
- Column
- Row
- Scalar

		17							14							
		Factor (F)							Institutions (i)							
Dimension	#	#	1	2	3	4	5	6	7	8	9	10	11	12	11a	11b
ACCOUNT	81	Label	Co	A	FL	FK	iH	iCr	iG	iTx	iSu	Cc	wCu	TC	mCo	wTr
Commodity	1	24	Co	0 (Co A)	0	0	0 (Co iH)	0	0 (Co iG)	0	0	0 (Co Co)	0 (Co wCu)	0 (Co TC)	0 (Co mCo)	0
Activity	2	24	A	0 (A Co)	0	0	0	0	0	0	0 (A iSu)	0	0	0 (A TC)	0	0
Factor Labor	3	16	FL	0	0 (FL A)	0	0	0	0	0	0	0	0 (FL wCu)	0 (FL TC)	0	0 (FL wTr)
Factor Capital	4	1	FK	0	0 (Fk A)	0	0	0	0	0	0	0	0 (Fk wCu)	0 (FK TC)	0	0 (Fk wTr)
Household	5	10	iH	0	0 (iH FL)	0 (iH Fk)	0 (iH iH)	0 (iH iCr)	0 (iH iG)	0	0	0	0 (iH wCu)	0 (iH TC)	0	0 (iH wTr)
Corporate	6	1	iCr	0	0	0 (iCr Fk)	0 (iCr iH)	0 (iCr iCr)	0 (iCr iG)	0	0	0	0 (iCr wCu)	0 (iCr TC)	0	0 (iCr wTr)
Government	7	1	iG	0	0	0	0 (iG iH)	0 (iG iCr)	0 (iG iG)	0 (iG iTx)	0	0	0 (iG wCu)	0 (iG TC)	0	0 (iG wTr)
Tax	8	1	iTx	0 (iTx Co)	0	0	0	0	0	0	0	0	0 (iTx wCu)	0 (iTx TC)	0 (iTx wTr)	0
Subsidy	9	1	iSu	0	0	0	0	0	0 (iSu iG)	0	0	0	0	0 (iSu TC)	0	0
Capital A/C	10	1	Cc	0	0	0	0 (cC iH)	0 (cC iCr)	0 (cC iG)	0	0	0	0 (cC wCu)	0 (cC TC)	0	0 (cC wTr)
World Consolidated Current A/C	11	1	wCu	0	0 (wCu A)	0 (wCu FL)	0 (wCu Fk)	0 (wCu iH)	0 (wCu iCr)	0 (wCu iG)	0	0 (wCu iSu)	0 (wCu Cc)	0 (wCu TC)	(deleted)	0
Total Row/Col	12	1	TR	0 (TR Co)	0 (TR A)	0 (TR FL)	0 (TR Fk)	0 (TR iH)	0 (TR iCr)	0 (TR iG)	0 (TR iTx)	0 (TR iSu)	0 (TR Cc)	0 (TR wCu)	0 (TR mCo)	0 (TR wTr)
Balance	1	Bal	0 (TC-TR Co)	0 (TC-TR A)	0 (TC-TR FL)	0 (TC-TR Fk)	0 (TC-TR iH)	0 (TC-TR iCr)	0 (TC-TR iG)	0 (TC-TR iTx)	0 (TC-TR iSu)	0 (TC-TR Cc)	0 (TC-TR wCu)			
Import	11a	24	mCo	0	0 (mCo A)	0	0	0 (mCo iH)	0	0 (mCo iG)	0	0 (wTr iSu)	0 (mCo cC)	0 (mCo TC)		
World Transfer	11b	1	wTr	0	0	0 (wTr FL)	0 (wTr Fk)	0 (wTr iH)	0 (wTr iCr)	0 (wTr iG)	0	0	0	0 (wTr TC)		

Consolidated  
# 11 = 11a + 11b



# What is a DySAM?

- A 1. **D**ynamic, 2. **S**ocial **A**ccounting **M**atrix, 3. with extension on employment, 4. with expansion on construction sector, 5. with technology choices
- It is a social accounting system reflecting the socio-economic structure of the economy
- It considers changes over time (linkages and employment multipliers)
- It includes, to some extent, behaviours of socio-economic actors

# Employment Satellite Account

	Agricultura	Silvicultua	Pesca	Industria mineira	...
<b>TOTAL</b>	17491	188	330	89	
<b>Sexo</b>					
Homem	6206	162	310	88	
Mulher	11285	26	20	1	
<b>Area residencial</b>					
Urbano	4662	71	175	47	
Rural	12829	117	155	42	
<b>Região</b>					
Norte	5511	24	100	12	
Centro	7096	62	107	18	
Sul	4884	102	123	59	
<b>Provincias</b>					
Niassa	1333	6	3	1	
...					
Cabo Delgado	2240	11	48	1	
Maputo province	878	38	12	12	
<b>Idade</b>					
15-19	2116	24	36	7	
20-24	2471	30	58	15	
...					
60-64	783	4	9	4	
<b>Nivel educacional</b>					
Nenhum	6799	52	80	7	
Primário (1o ciclo)	8740	101	185	56	
Primário (2o ciclo)	1522	25	44	16	
Secundário e mais	430	10	21	10	

Mozambique





# Possible scenarios: Public spending



1 trillion of Rupiah on:

1. Labour-based road construction
2. Capital-based road construction
3. Subsidies to enterprises in garment industry

# INJECTION AREA



#	#	1	2	3	4	5	6	7	8	9	10	11	
Account	Co	A	FL	FK	iH	iCr	iG	iTx	iSu	Capital	wCu	TC	
Dimension	#	24	24	16	1	10	1	1	1	1	1	1	81
Commodity (24)	Co	<s3 (Co A)>				<s3 (Co iH)>		<s3 (Co iG)>			FSPC	<s3 (Co wCu)>	<s3 (Co Tc)>
Activity (24)	A	<s3 (A Co)>								<s3 (A iSu)>			<s3 (A Tc)>
Factor Labor (16)	FL	<s3 (FL A)>										<s3 (FL wTr)>	<s3 (FL Tc)>
Factor Capital (1)	FK	<s3 (Fk A)>										<s3 (Fk wTr)>	<s3 (Fk Tc)>
Household (10)	iH		<s3 (iH FL)>	<s3 (iH Fk)>	<s3 (iH iH)>	<s3 (iH iCr)>	<s3 (iH iG)>					<s3 (iH wTr)>	<s3 (iH Tc)>
Corporate (1)	iCr			<s3 (iCr Fk)>	<s3 (iCr iH)>	<s3 (iCr iCr)>	<s3 (iCr iG)>					<s3 (iCr wTr)>	<s3 (iCr Tc)>
Government (1)	iG					<s3 (iG iH)>	<s3 (iG iCr)>	<s3 (iG iG)>	<s3 (iG iTx)>			<s3 (iG wTr)>	<s3 (iG Tc)>
Tax (1)	iTx	<s3 (Itx Co)>										<s3 (iTx wTr)>	<s3 (iTx Tc)>
Subsidy (1)	iSu							<s3 (iSu iG)>					<s3 (iSu Tc)>
Capital A/C (1)	Cc					<s3 (Cc iH)>	<s3 (Cc iCr)>	<s3 (Cc iG)>				<s3 (Cc wTr)>	<s3 (Cc Tc)>
RoW Consolidated (1)	wCu	<s3 (wCu A)>	<s3 (wTr FL)>	<s3 (wTr FK)>	<s3 (wCu iH)>	<s3 (wTr iCr)>	<s3 (wCu iG)>			<s3 (wTr iSu)>	<s3 (wCu Cc)>		<s3 (wCu Tc)>
Total Row/Col	TR	<s3 (Tr Co)>	<s3 (Tr A)>	<s3 (Tr FL)>	<s3 (Tr Fk)>	<s3 (TriH)>	<s3 (TriCr)>	<s3 (TriG)>	<s3 (TriTx)>	<s3 (TriSu)>	<s3 (Tr Cc)>	<s3 (Tr wCu)>	

Note: FSPC = Part of the FSP which went into infrastructure/construction investment

# Employment account after simulation (incl. multipliers)

		Cap. Road	Lab. Road	Garment
rural	male	8	25	8
	female	2	15	12
	total	10	40	20
urban	male	14	7	10
	female	6	3	20
	total	20	10	30
16-29 years		20	25	30
Over 29 years		10	25	20
<b>Total</b>		<b>30</b>	<b>50</b>	<b>50</b>

# Or the other way around: calculating back from target

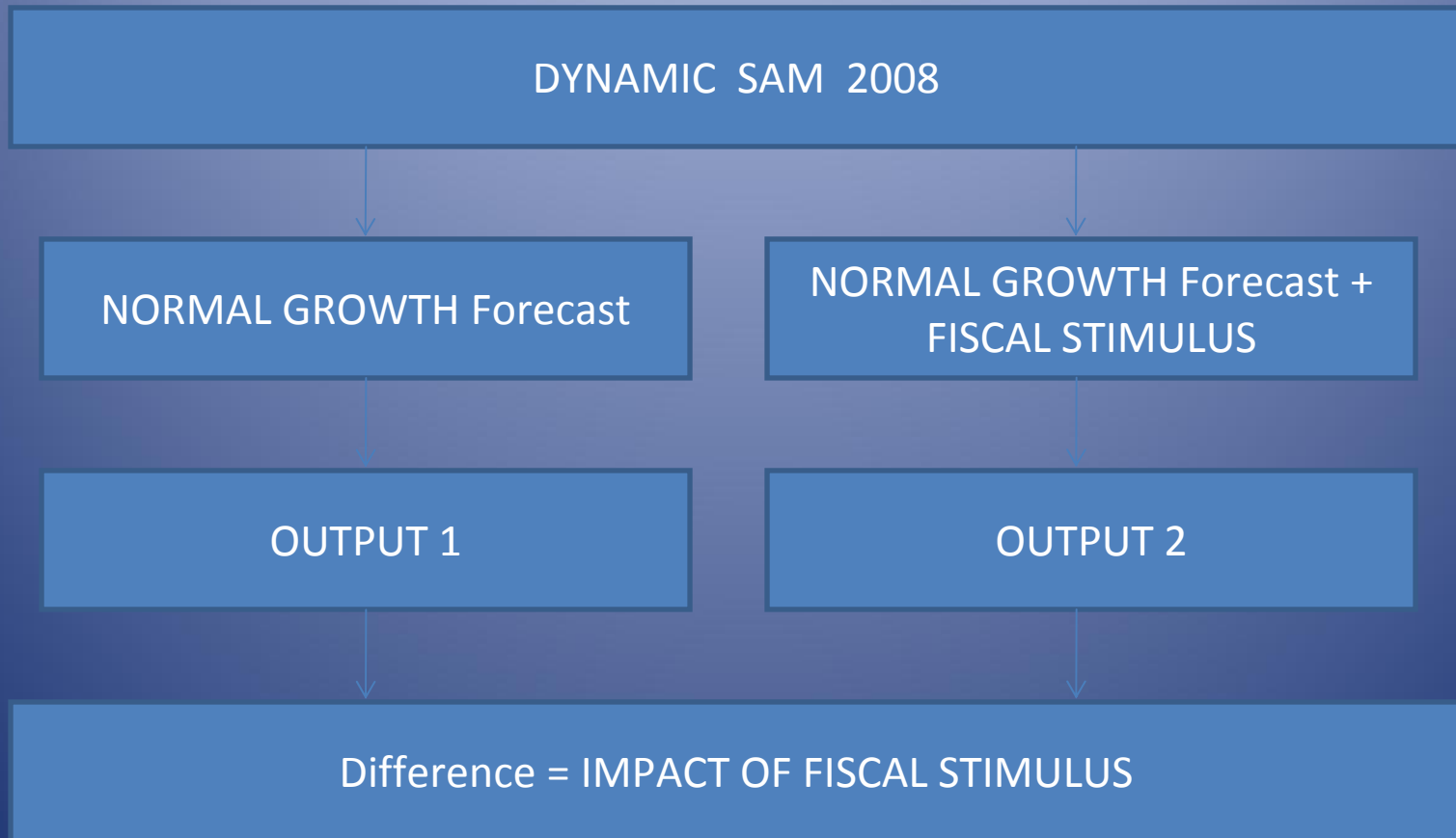
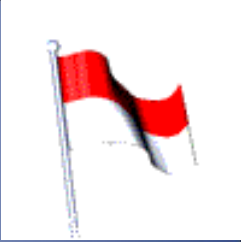
		Scenario?
rural	male	
	female	
	total	
urban	male	
	female	
	total	
16-29 years		<b>1 Million</b>
Over 29 years		
Total		



	Trillion Rupiah
Labour based road construction	1.7
Capital based road construction	1.5
Garment industry	1.3

**What is the most (cost-) effective public spending to create  
1 million jobs for the youth?**

# SIMULATION SCENARIO



# Projection for 2009



In billion Rp

Time (Year)	2000	2001	2002	2003	2004	2005	2006	2007	2008	Projected 2009
[c Construction r5]	Rp 231,039.89	Rp 273,084.25	Rp 294,978.13	Rp 348,392.50	Rp 393,896.44	Rp 487,166.69	Rp 572,677.69	Rp 677,833.75	Rp 886,423.00	Rp 1,050,135.19
Annual increase		18.20%	8.02%	18.11%	13.06%	23.68%	17.55%	18.36%	30.77%	
Average Percentage increase	18.47%									

- Annual Average Percentage increase in construction capital formation until 2008 is 18.47%
- From that data, we could have the projection for 2009 which is Rp 1,050.13 billion
- In 2009, there is fiscal stimulus which is Rp 12.2 trillion to the infrastructure sector.


# Total Impact on Job creation 2009: Economy Wide, Construction by Type and Crops

<b>JOB CREATION</b>	<b>Employment Increase (Growth)</b>	<b>Share</b>	<b>ME Factor(*)</b>	<b>ME Persons (*)</b>	<b>ME Share</b>
Total Economy Wide	287,060 (0.26%)	100%	1.02	292,801	100%
a RoadLI r2	25,722 (9%)	9.0%	1.16	29,837	10.2%
a RoadKI r2	8,539 (9%)	3.0%	1.16	9,905	3.4%
a Irrig r2	4,851 (9%)	1.7%	1.16	5,627	1.9%
a ConstRest r2	11,125 (9%)	3.9%	1.16	12,905	4.4%
a Crops r5	81,951 (0.22)	28.5%	0.80	65,204	22.3%

Note: ME = Manpower Equivalence (full-employment)

# Intra Account Impact on Job creation

## 2009: Economy Wide, Construction by Type and Crops



JOB CREATION	Employment Increase	Share	ME Persons (*)
<b>Total Economy Wide</b>	<b>113,803</b>	<b>100.0%</b>	116,079
a RoadLI r2	25,602	22.5%	29,698
a RoadKI r2	8,499	7.5%	9,859
a Irrig r2	4,829	4.2%	5,602
a ConstRest r2	11,073	9.7%	12,845
a Crops r5	2,314	2.0%	1,841

Note: Intra-account effect = production coefficient




# Employment Shares by Location and Gender



	<b>Urban Male</b>	<b>Urban Female</b>	<b>Rural Male</b>	<b>Rural Female</b>	<b>Total Urban</b>	<b>Total Rural</b>	<b>Total 2008</b>
<b>Economy wide</b>	25.4%	15.6%	36.9%	22.1%	41.0%	59.0%	100.0%
<b>Construction</b>	46.9%	1.6%	50.8%	0.8%	48.4%	51.6%	100.0%

# Net cost of the construction fiscal stimulus package in 2009 (Billion IDR)



Injection Fiscal stimulus package	Effect on Government Income	Net Cost Fiscal Stimulus Package
10,825.0	2,288.58	8,526.42

# Top Ten Increase in Final output of Production Activity Account

In billion Rp

No	Element of sector account	Projected 2009	Projected + Fiscal Stimulus	Increase in total Output	% Increase in total Output
1	a Irrig r5	Rp417,601.72	Rp422,166.47	Rp4,564.75	1.09%
2	a RoadLI r5	Rp145,135.59	Rp146,722.05	Rp1,586.45	1.09%
3	a ConstRest r5	Rp174,612.42	Rp176,521.08	Rp1,908.66	1.09%
4	a RoadKI r5	Rp332,669.78	Rp336,306.13	Rp3,636.34	1.09%
5	a MiningQuarry r5	Rp64,664.14	Rp65,303.19	Rp639.05	0.99%
6	a ForestHunt r5	Rp45,384.40	Rp45,655.21	Rp270.82	0.60%
7	a Wood r5	Rp140,248.47	Rp140,792.20	Rp543.73	0.39%
8	a RealEstate BusinessSrv r5	Rp290,101.69	Rp291,065.28	Rp963.59	0.33%
9	a BankInsuranceSrv r5	Rp288,096.88	Rp288,949.94	Rp853.06	0.30%
10	a TradeSrv r5	Rp822,734.38	Rp825,136.88	Rp2,402.50	0.29%

- In total, the fiscal stimulus in construction sector of 2009 will increase the final output in Labour Factor account for Rp 32.68 billion
- The five production activity element that have the highest % increase are: Irrigation, Road Labour intensive, Road Capital Intensive, and also mining quarry.

# Top Ten Increase in employment creation

No	Element of sector account	Projected 2009 for total employment	Projected + Fiscal Stimulus for total employment	Employment Creation due to Fiscal Stimulus	Employment Growth
1	a Irrig c5	611,780	618,468	6,687	1.09%
2	a RoadLI c5	3,345,936	3,382,510	36,574	1.09%
3	a RoadKI c5	1,054,772	1,066,302	11,530	1.09%
4	a ConstRest c5	1,392,114	1,407,331	15,217	1.09%
5	a MiningQuarry c5	1,004,287	1,014,212	9,925	0.99%
6	a ForestHunt c5	735,429	739,818	4,388	0.60%
7	a Wood c5	1,660,189	1,666,625	6,437	0.39%
8	a RealEstate BusinessSrv c5	806,399	809,077	2,679	0.33%
9	a BankInsuranceSrv c5	720,677	722,811	2,134	0.30%
10	a TradeSrv c5	18,024,584	18,077,218	52,634	0.29%

- In total, the fiscal stimulus in construction sector of 2009 will increase the employment creation by 327,793 workers.
- Elements of activity account with the biggest increase: Irrigation, Road Labour-Intensive as well as Capital-intensive and also Rest of the construction, which is the construction sector itself.

# Summary findings

- In 2009, Rp 12.2 trillion of Fiscal Stimulus in Construction sector will increase the employment creation by 0.3%.
- In 2009, Fiscal Stimulus in Construction sector will induce the economic growth in term of the increase the total output by 0.13 %.

# Unit Injection in (A A) Account: Total Impact and its Decomposition

