



REDISTRIBUTING WATER RIGHTS BETWEEN THE WEST BANK AND ISRAEL

—

MORE THAN A ZERO-SUM GAME?

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Background: Shared aquifers



| | Oslo Agreement of 1995 | Utilization 2011 |
|---|------------------------|------------------------|
| | Million m ³ | Million m ³ |
| Israel | 483 | 664 |
| Palestine | 118 | 87* |
| Additional quantity for Palestinian Development | 78 | 0 |
| Total | 679 | 751 |

* Not including water abstracted from unauthorized wells
 (World Bank, 2018; PWA, 2012)



(Brooks and Trottier, 2010)

Water balances West Bank – Israel

| | West Bank Million m ³ | Israel Million m ³ |
|---|-------------------------------------|----------------------------------|
| Wells/Springs | 87 | 1,061 |
| Desalination | 0 | 313 |
| Reclaimed water | 0 | 447 |
| Brackish water | 0 | 179 |
| Imported water | 53 | 0 |
| TOTAL | 140 | 2,000 |
| Population [Mio] | 2.34 | 7.77 |
| Water supply per capita [m ³] | 60 | 257 |

(PWA, 2012; CBS, 2012, own calculations)



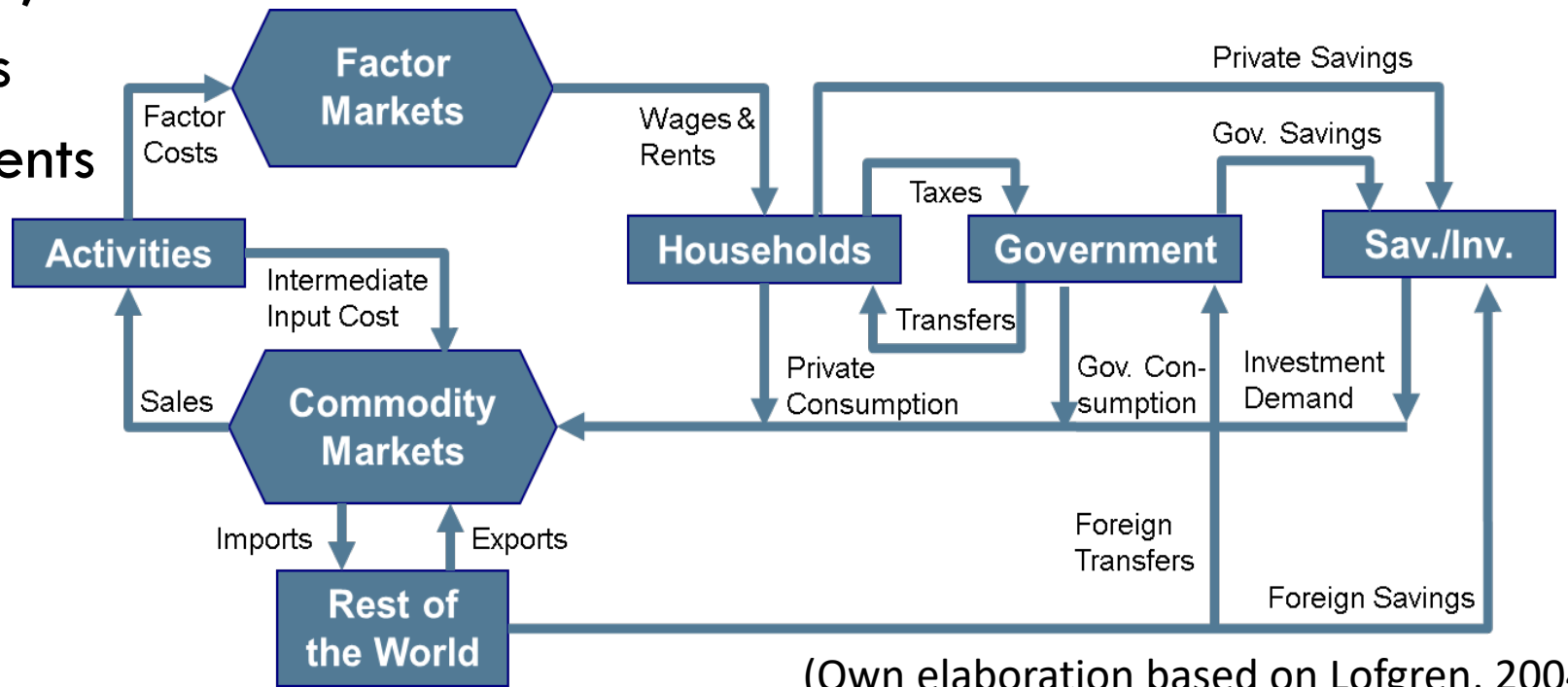
Problem statement

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- Water is a scarce resource in the whole region
- Due to geographical situation and economic development dependency on groundwater resources differs among political entities
 - Different level of severity of water scarcity
 - Potentially net gains from reallocating water resources

Approach

- Simulate economic effects of transferring water rights from Israel to the West Bank on both economies using a water focused CGE-model: STAGE_W (Luckmann & McDonald, 2014)
 - ▣ Multiple water resources, activities and commodities
 - ▣ Water satellite accounts
 - ▣ Water taxation-instruments

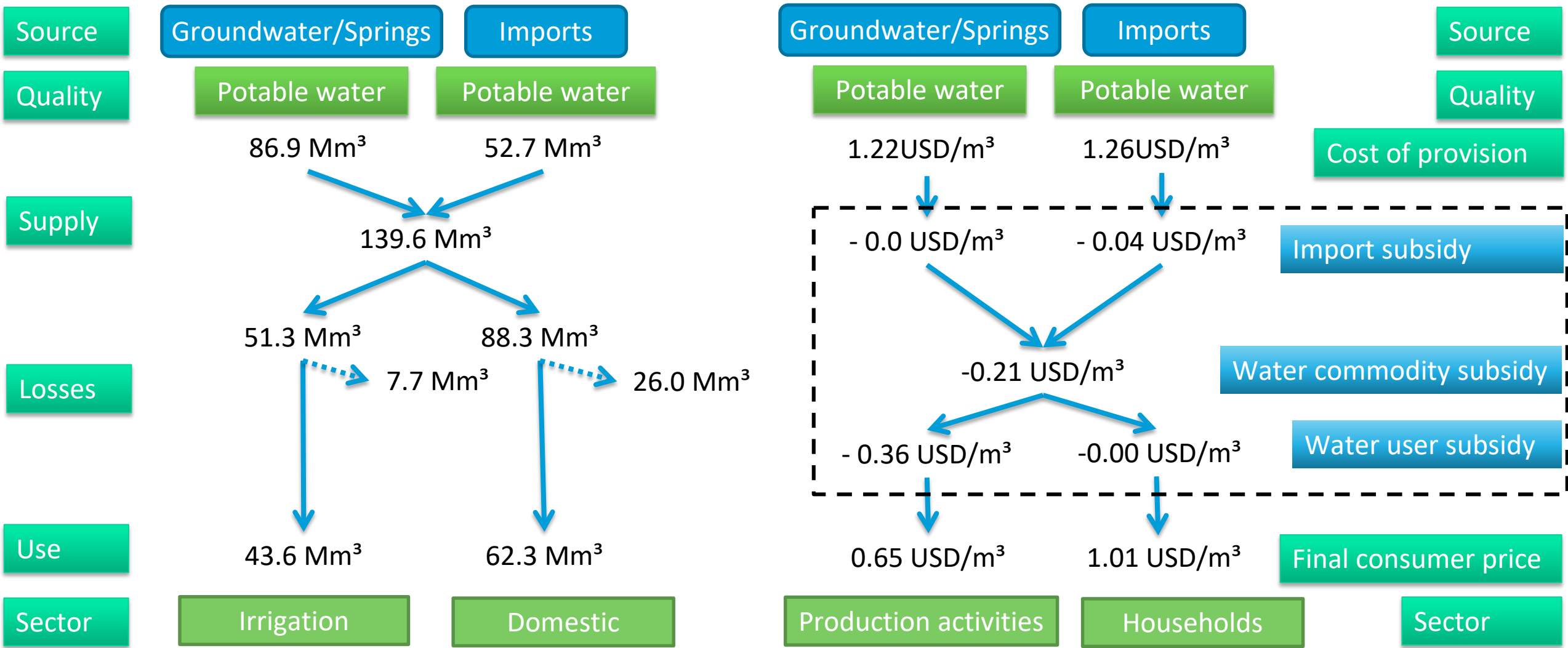


(Own elaboration based on Lofgren, 2004)

Data-bases: Social Accounting Matrices

| | West Bank | Israel |
|--------------|---|---|
| Source | based on Agbahey et al. (2016) | based on Siddig et al. (2011) |
| Base year | 2011 | 2010 |
| Accounts | 120 - 45 commodities - 37 activities - 8 factors - 10 household-groups | 205 - 45 commodities - 45 activities - 41 factors - 10 household-groups |
| Water sector | 1 resource → 1 activity → 1 water quality 3 specific tax instruments Import subsidy Commodity subsidy (non-revenue water) User subsidy (non-metered/paid water) | 4 resources → 4 activities → 3 water qualities 3 specific tax instruments Production subsidy (desalination) Commodity tax User subsidy (price discrimination) |

West Bank – Water supply and pricing



Scenarios

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□ (Scenario 1: new wells)

Palestine fully exploits its allowance according to the Oslo-Agreement

▣ West Bank: Increase domestic water supply from 87 Mm³ to 196 Mm³

□ Scenario 2: new agreement

Israel and Palestine negotiate a new agreement on the use of the mountain aquifer, allowing each side to extract an equal share of 340 Mm³ per year

▣ West Bank: Increase domestic water supply from 87 Mm³ to 340 Mm³
(+253 Mm³)

▣ Israel: Reduce potable water supply from 1061 Mm³ to 808 Mm³ (-253 Mm³)

Results: West Bank - Water supply and use

| | | Water quantity | | Change compared to base |
|--------|---------------|---------------------------|---------------|-------------------------|
| | | [Million m ³] | | [%] |
| | | base | new agreement | new agreement |
| Supply | Wells/springs | 73 | 286 | 291 |
| | Imports | 33 | 33 | 0 |
| | Total | 106 | 319 | 201 |
| Use | Agriculture | 44 | 114 | 161 |
| | Industry | 2 | 6 | 170 |
| | Services | 15 | 42 | 164 |
| | Households | 43 | 154 | 256 |
| | Government | 1 | 1 | 0 |

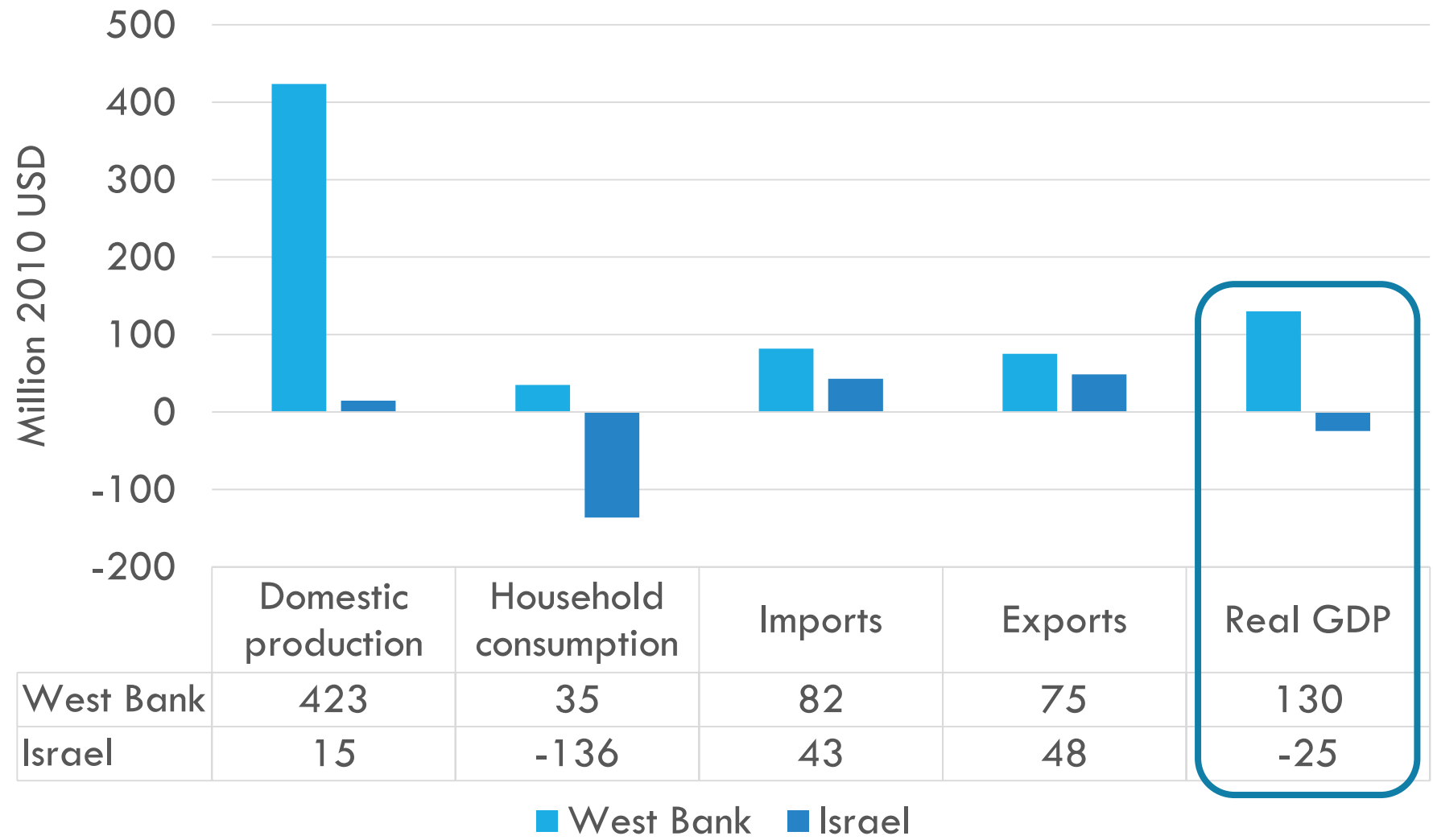
Results: Israel - Water supply and use

| | | Water quantity | | Change compared to base |
|--------|---------------|---------------------------|---------------|-------------------------|
| | | [Million m ³] | | [%] |
| | | base | new agreement | new agreement |
| Supply | Wells/springs | 1,061 | 808 | -23.8 |
| | Desalination | 313 | 564 | 80.1 |
| | Brackish | 179 | 179 | 0.0 |
| | Reclamation | 447 | 446 | -0.1 |
| | Total | 2,000 | 1,997 | -0.1 |
| Use | Agriculture | 1,062 | 1,061 | -0.1 |
| | Industry | 129 | 129 | -0.2 |
| | Services | 196 | 196 | -0.2 |
| | Households | 556 | 556 | -0.1 |
| | Government | 57 | 57 | 0.0 |

Results: Production-effects

| | West Bank | | Israel | |
|-------------|------------------|------------------|------------------|------------------|
| | Change in output | Water cost share | Change in output | Water cost share |
| Agriculture | 3% | 4.35% | -0.01% | 4.05% |
| Industry | 2% | 0.06% | 0.04% | 0.14% |
| Services | 3% | 0.13% | -0.01% | 0.24% |

Results: Macroeconomic-effects

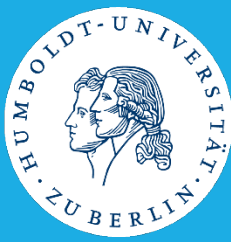


West Bank: +1.65%
 Israel: - 0.01%

Concluding remarks

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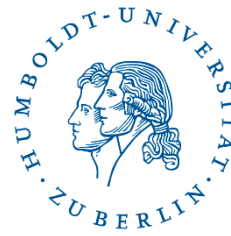
- Net economic gains from shifting water rights from Israel to the West Bank, as West Bank has:
 - ▣ Less substitution possibilities
 - ▣ Higher relative dependence on mountain aquifer
- Additional gains due to peacebuilding aspect possible
- STAGE_W can be used to substantiate political negotiation process towards final water agreement
 - ▣ Indirect effects incorporated
 - ▣ Expandable to further water resources (e.g. Jordan River)



THANK YOU FOR YOUR ATTENTION!

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References



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