



OFID PAMPHLET SERIES

The energy–water–food nexus:
**Managing key resources
for sustainable development**

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OFID Unity against Poverty



MDGs vs. SDGs

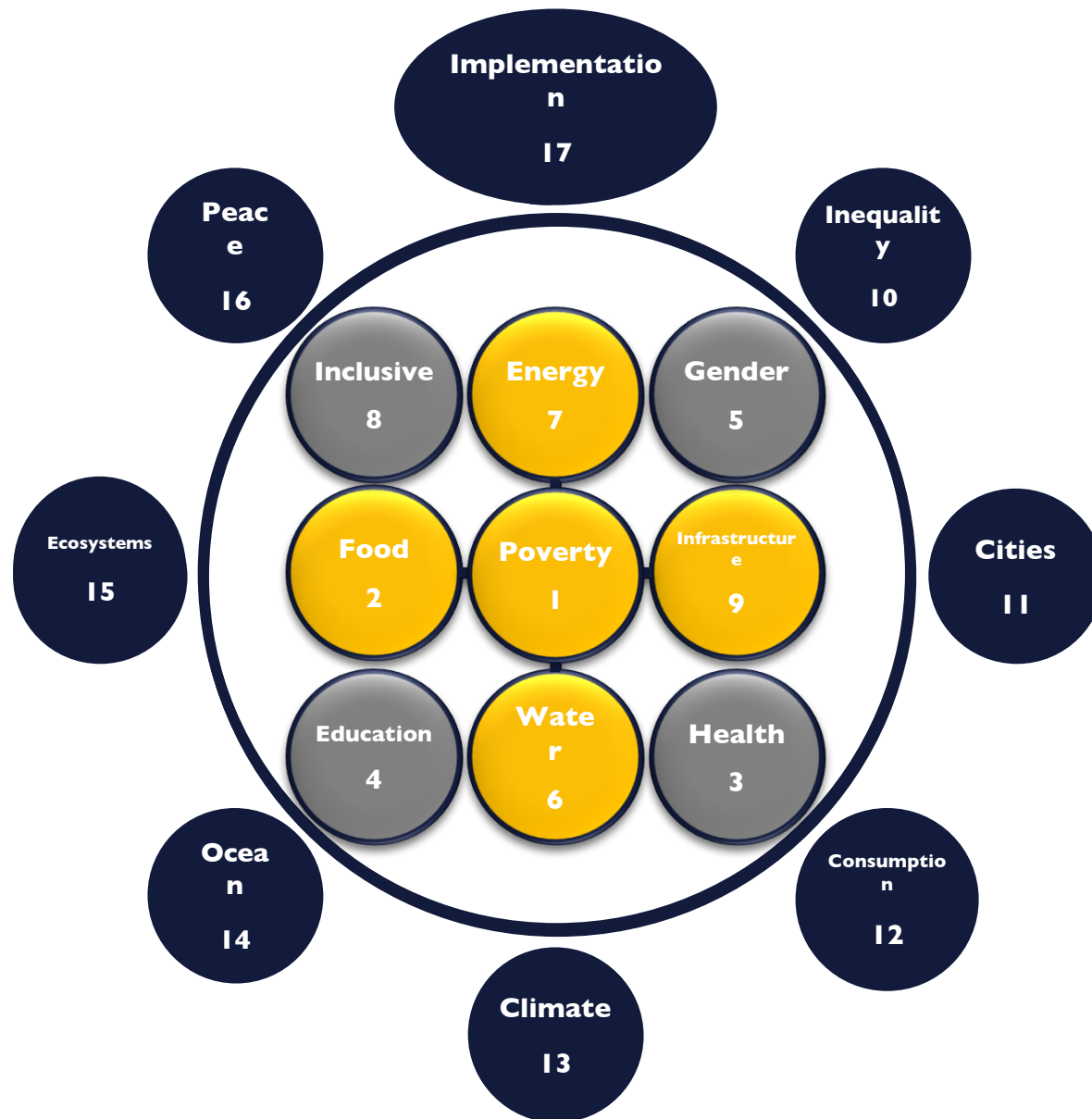
MDGs



SDGs



UNDERSTANDING THE SDGS



INTRODUCTION

- Food security, sound water management and universal access to modern energy services are key goals in the 2030 Agenda for Sustainable Development
- The three sectors were top priorities for the UN Member States
- Nutritious food and clean water are necessary for life, and energy is a prerequisite for a transformation of economy.



ENERGY, WATER & FOOD ARE LINKED

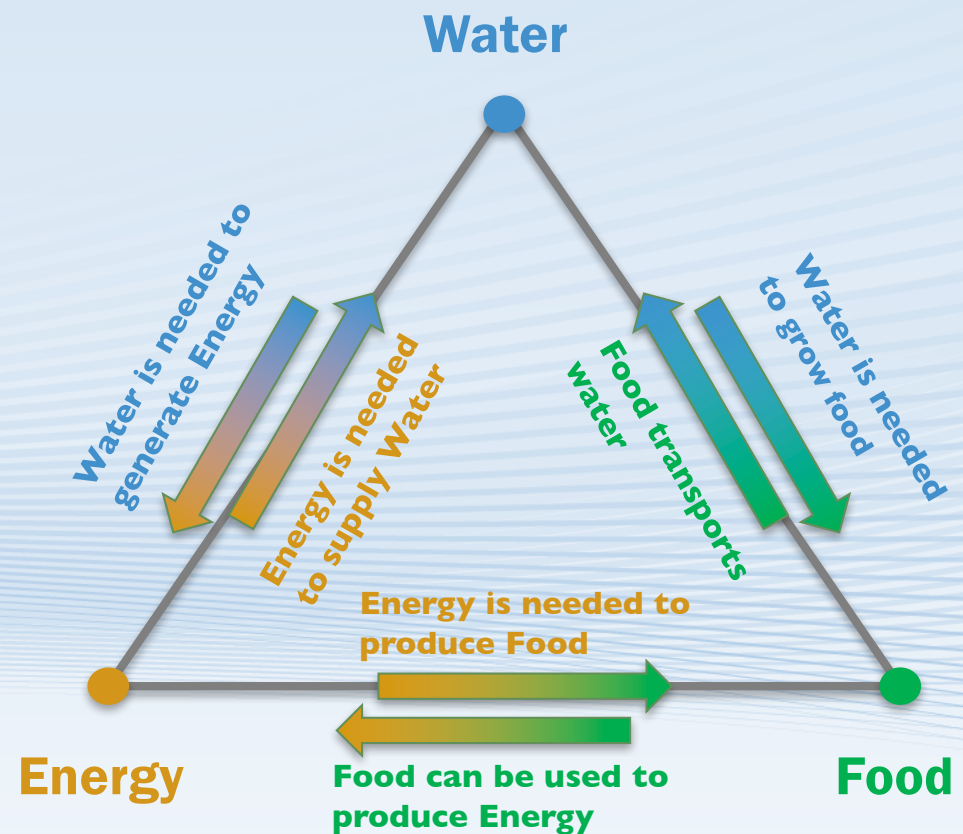
- Energy, water and food have always been high priorities in the work of development.
- This applies also to OFID, where projects are demand driven
- Most traditional development solutions have treated these three sectors separately.
- But they are interdependent and entwined.



In “silo approach”, risks and uncertainties arise if policies and interventions made without cross-sectoral coordination.



The nexus planning approach focuses on interdependence and potential consequences of one sector on another.

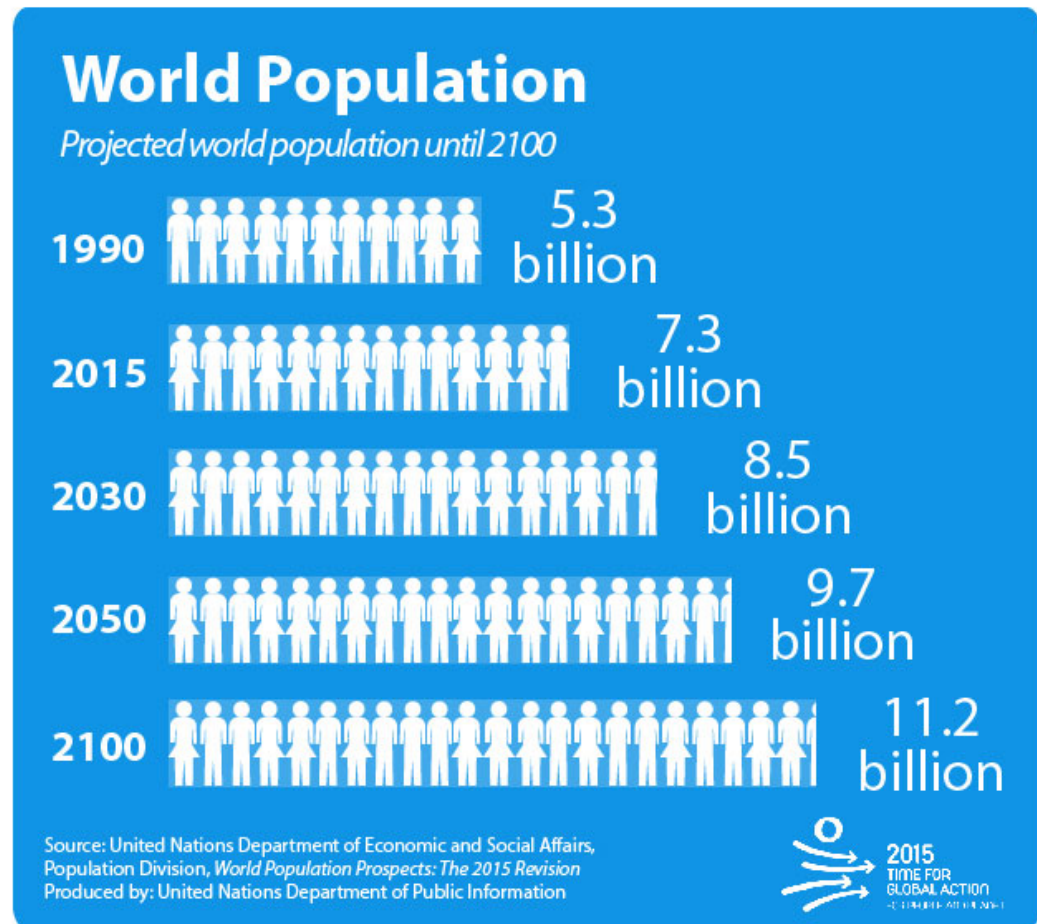


Demographic trends increasing the pressures on EWF resources.

The world population is growing, it is projected to reach 8.5 billion in 2030, and 9.7 billion in 2050.

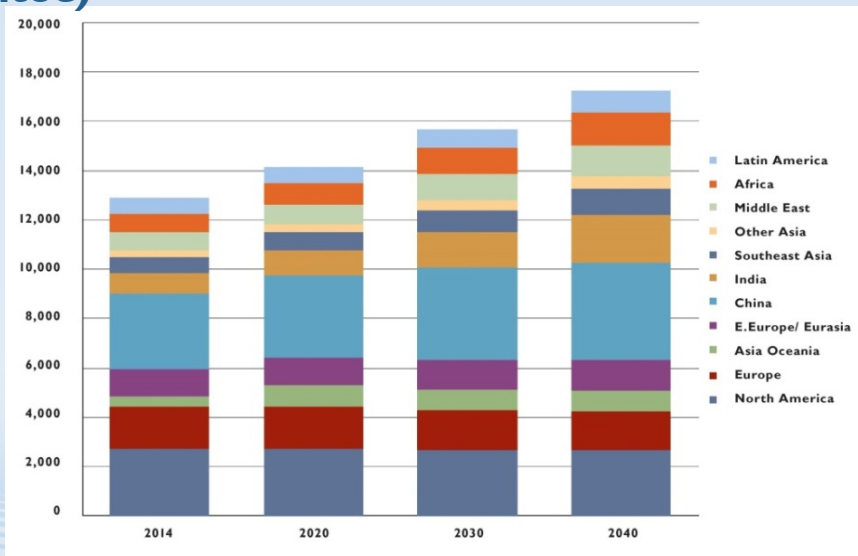
Almost all the additional 2.4 billion people will be in Africa and Asia. Where the EWF resources already under pressure.

By 2050, the world will be one-third rural and two-thirds urban.

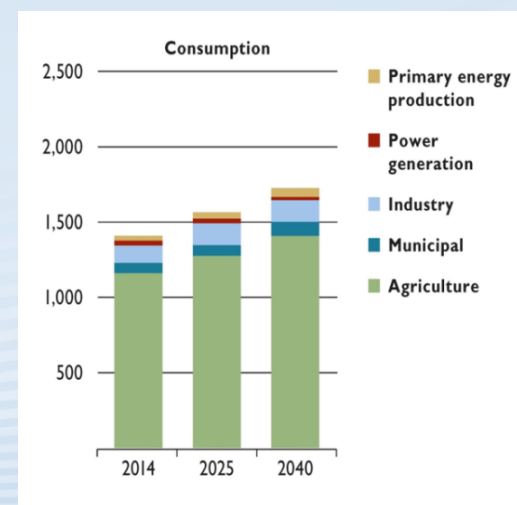


Energy-Water-Food Trends

Energy consumption will continue to grow, (in mtoe)



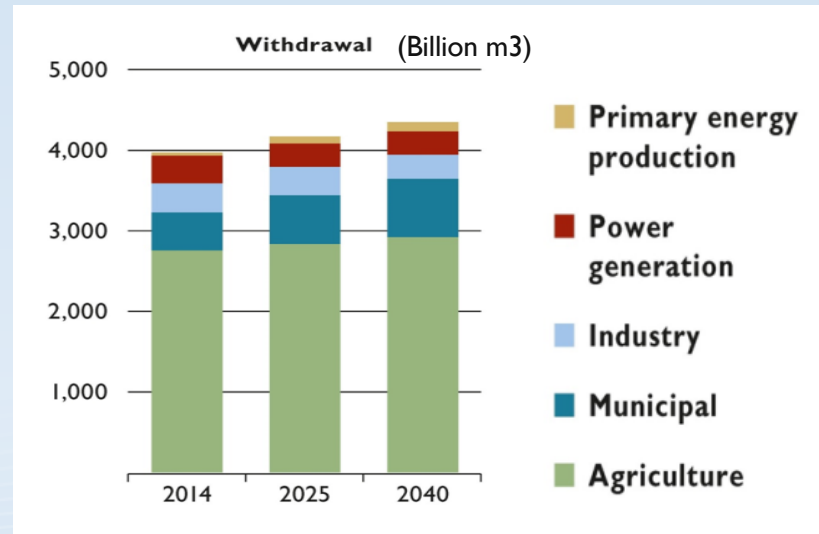
Water demand will increase by all sector (billion m3)



- **To meet the world's food needs in 2050, annual world production of crops and livestock will need to be 60 percent higher.**
- **To feed the growing populations in developing countries:**
 - Agricultural production will need to almost double by 2050.
 - Arable land will need to expand by 12 percent, almost all in sub-Saharan Africa and Latin America.
 - Water withdrawals for irrigation will need to grow by almost 11 percent by 2050.

Source: IEA & FAO

ENERGY-WATER-FOOD NEXUS



- Water demand will increase across all sectors
- Approximately 40 percent of the world's food is cultivated in artificially irrigated areas
- Massive overuse of water and falling groundwater tables in many parts of the world, causing contamination and salinity increase as well as higher pumping costs
- Global energy use in the water sector will more than double by 2040 as desalinization capacity increase by eightfold in the Middle East and North Africa.

MAPPING THE RISKS

- Global trends; but implications and risks vary regionally
- Similar concerns in developing countries:
 - millions of people still experience energy, water and food insecurity
 - constrained water and land resources
- In general, the highest priority is to close simultaneously the large gaps, requiring investment
- For emerging economies, focus is on ensuring adequate availability to support growing economy, while ensuring water, energy and food security for poor and rural households.
- In developed countries focus on improving use efficiency to enable domestic consumption, production and trade, while dealing with climate challenges
- Interlinkages demonstrate the relevance of nexus approaches

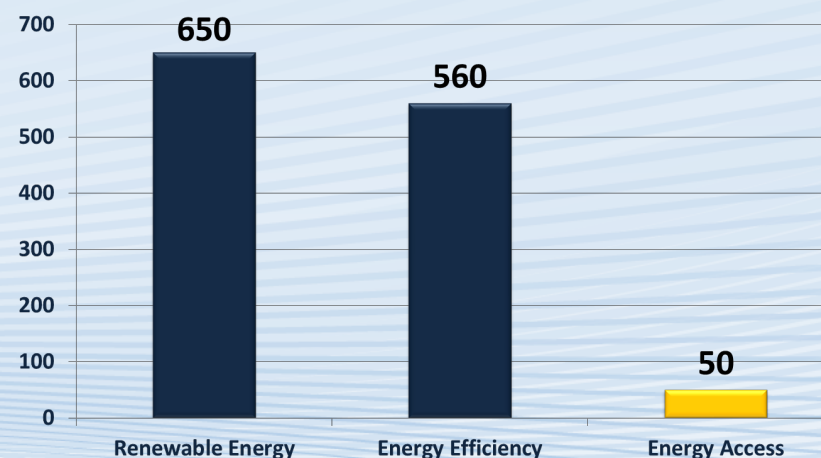
The SDGs and implementing the nexus

- While the MDGs aimed to lift people out of poverty, the SDGs aim to keep them out of poverty by **ensuring that development is both inclusive and sustainable**.
- To achieve this we need a Framework that consider the ways activities in different sectors interact.
- A nexus approach can help formulate goals and targets that minimize trade-offs and maximize synergies between goals,
- This will make the SDGs more cost-effective and efficient.
- For instance, under the post-2015 agenda, the EVWF-nexus suggests links between most of the targets under Goal 2, Goal 6 and Goal 7.
- But, in order to address them effectively, there is a need to understand the nature of those interactions as enablers of development.

Cost of Financing the SDGs and Their Sectors

| Sector | Description | Estimated current investment (latest available year) \$ billion A | 2015-2030 | |
|-----------------------------------|--|--|---|-----------------------------|
| | | | Total investment required B | Investment Gap C = B - A |
| | | | Annualized \$ billion (constant price) | |
| Power ^c | Investment in generation, transmission and distribution of electricity | ~260 | 630–950 | 370–690 |
| Transport ^c | Investment in roads, airports, ports and rail | ~300 | 350–770 | 50–470 |
| Telecommunications ^c | Investment in infrastructure (fixed lines, mobile and internet) | ~160 | 230–400 | 70–240 |
| Water and sanitation ^c | Provision of water and sanitation to industry and households | ~150 | ~410 | ~260 |
| Food security and agriculture | Investment in agriculture, research, rural development, safety nets, etc. | ~220 | ~480 | ~260 |
| Climate change mitigation | Investment in relevant infrastructure, renewable energy generation, research and deployment of climate-friendly technologies, etc. | 170 | 550–850 | 380–680 |
| Climate change adaptation | Investment to cope with impact of climate change in agriculture, infrastructure, water management, coastal zones, etc. | ~20 | 80–120 | 60–100 |
| Eco-systems/ biodiversity | Investment in conservation and safeguarding ecosystems, marine resource management, sustainable forestry, etc. | | 70–210 ^d | |
| Health | Infrastructural investment, e.g. new hospitals | ~70 | ~210 | ~140 |
| Education | Infrastructural investment, e.g. new schools | ~80 | ~330 | ~250 |

Total Annual Investment Needs to Achieve SDG7

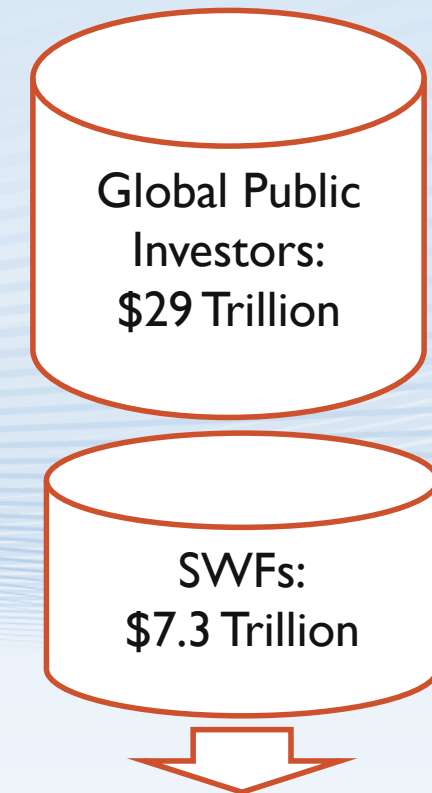


Source: SE4All 2015

Sources of Finance & Channelling them to Nexus

| 3Ts | Loan and bond finance | Equity finance |
|----------------------------|-------------------------|-----------------------------|
| Tariffs & user charges | Commercial banks | Sovereign wealth funds |
| Taxes/subsidies | Institutional investors | Institutional investors |
| Transfers (grants etc.) | Sovereign wealth funds | IFIs |
| Final user's contributions | Public bond issues | Private equity funds |
| | DFIs | Public-private partnerships |
| | Project bond | Individual shareholders |

Is the Fund Available?



Risk Mitigation & Attractive Returns



**How to Raise Fund for
Nexus**

OFID & THE EWF NEXUS

- The EWF nexus connects with all SDGs
- Nexus investments promoted
- Corporate Plan envisages that the three nexus strands, together with transportation as enabling sector, will command 70% of commitments in the coming decade.
- Builds on the emphasis on alleviating energy poverty and the importance of agriculture
- But success will depend on partner countries recognizing and understanding the nature of the nexus challenge and planning their development strategies accordingly
- Grant projects showcasing the importance of adopting a nexus perspective when planning and implementing development interventions in developing countries.

Solar pumps in the field in Kenya



Field testing of biogas-powered milk chillers





Thank You