**WAT part in the Integrated Solutions for Water, Energy, and Land project**

**What is the WAT part?**

**Water demand:**

Can be modelled on the user side i.e. Energy program can describe what plant need what amount of water, which amount is returned, which scenarios which solution can reduce the demand.

**Water supply:**

Can be used from several models free available with ISI-MIP or other IIASA sources (VIC model, LPJmL model). However socio-economic scenarios have not been considered in these simulations but only climate change scenarios (with four RCPs) were considered.

**What is missing and can be done by WAT**

* Dynamic link between supply and demand with an integrated hydrological model
  + to calculate real water availability for the downstream water users after water consumption and reservoir operations
  + to calculate the economic (or other) benefit of water allocation and management policies
* Incorporation groundwater use (40% of global water use), with surface water availability and demand to assess the nonrenewable part of groundwater (addressing groundwater depletion)
* Incorporate reservoirs in a multi-user, multi-objective way (hydropower, water supply, flood control, navigation, etc)
* including water quality aspects linking to agriculture (i.e. nitrate, phosphate)
* The direct link to other IIASA models (Globiom, Message) going a step further than soft linking

**What is our path:**

**First Step:**

* Using PCR-GLOBWB or LISTFLOOD to couple with Message, Globiom, Hydro-economics on 30x30min raster cell
* Using 5x5min for fine resolution (global but more for case studies)
* Implementing links to other IIASA models
* Linking water supply – demand
* Agent based approach for hydro-economic modeling

**Second step**:

Building a Community Water Model (CWatM)", including advantages from existing models (i.e PCR-GLOBEWB, LISFLOOD, MATSIRO, H08, LPJmL) and with the expertise from modelers at WAT (Yoshi, Yusuke, Peter, Taher, Amandine, Michelle, Ted ..)

* Advantage of having a “own” model at IIASA with we can fit to our needs.
* Advantage of a community model approach (community driven, modular, which different extension for different users)
* Open source for other users

**Main goal is to have a:**

**Flexible** (different resolution, different processes for different needs, links to other models )

**Adjustable** (Tailor a model to the needs at IIASA i.e. collaboration with other programs/models, including solutions and option as part of the model (i.e. environmental flow, groundwater, hydro-economics, crop modeling)

**Agent based:** to be able to incorporate the stakeholders options

**Sensitive**: (The model must be sensitive enough to evaluate different options i.e. change partly the land use of a grid cell must be reflected in the output, calculating vulnerability)

**Comparable** (i.e keeping the strong linkage to ISI-MIP for multi-model approaches, for model comparison)

**Modular** (to have the choice of using different approaches, different links to different models i.e. hydro-economics, agricultural model)

At the same time we keep our basic working framework within the multi-model group (WaterGAP, PCR-GLOB, H08, ISI-MIP) in order to produce an ensemble run and associated uncertainty in the model estimates. It is also important to keep the diversity of different approaches. We don’t want to make the same model for all.

**What we need:**

**Staff:**

At the moment: **Yusuke, Guenther**, Sylvia, **Taher, Peter**, Luzma, Simon (from May), **Yoshi** (3 month 2016, 2017) (modelers in bold)

1 more modeler 50,000 x 3 years = 150,000

1 or 1 1/2 for stakeholder relation (1 from Indus/ Zambezi catchment) for organizing meetings, conferences, water related issues (1/2 for Quantitative water projection i.e. Assumptions for technological change under each SSP. Assumption on solution/option based on countries capacities)

1 1/2 \* 50,000 x 3 years = 225,000 (might be more expensive for an experienced one)

1 for GIS work (non Post doc) Ysohi think of a shared person, but I think 1 for WAT would be good (I do not have good experience in sharing people)

40,000 x 3 years = 120,000

(I have to ask Angelika what are the cost for a post doc ? 50,000 EUR)

**Equipment:**

A general IIASA effort has to be made for keeping computational power up to date (or reaching)

But:

What do you think of ?

3 big desktop (20-36 multi-core windows machines) 10,000

30 TB ram 30,000

**Traveling:**

Total

Total budget: 3,800,000 $ = 3,400,000 EUR

Sum WAT: 535,000 EUR = 16 % of total budget

**In general cross program**

2 people for cross-program web design, web application

2 \* 40,000 x 3 years = 240,000

Computing: Cluster for running models:

500.000 (I put in a rather big amount, because I think we need to invest here)

- cluster + diskspace

**part i: project information**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Project Title: Integrated Solutions for Water, Energy, and Land | | | | |
| Country(ies): | Global | GEF Project ID:[[1]](#footnote-1) | | 6993 |
| GEF Agency(ies): |  | GEF Agency Project ID: | | 140312 |
| Other Executing Partner(s): | IIASA | Submission Date: | |  |
| GEF Focal Area (s): |  | Project Duration (Months) | | 36 |
| Integrated Approach Pilot | IAP-Cities  IAP-Commodities  IAP-Food Security | | Corporate Program: SGP | |
| Name of Parent Program | [if applicable] | Agency Fee ($) | | 180,500 |

1. [**Focal Area Strategy Framework and Other Program Strategies**](https://www.thegef.org/gef/sites/thegef.org/AppData/Local/Microsoft/Windows/Temporary%20Internet%20Files/AppData/Local/Microsoft/Windows/Temporary%20Internet%20Files/Content.Outlook/5RRT28VG/refer%20to%20the%20excerpts%20on%20GEF%206%20Results%20Frameworks%20for%20GETF,%20LDCF%20and%20SCCF.)**[[2]](#footnote-2)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Focal Area Objectives/Programs** | **Focal Area Outcomes** | Trust Fund | (in $) | |
|  |  |  | GEF Project Financing | Co-financing |
|  | Outcome B. Policy, planning and regulatory frameworks  foster accelerated low GHG development and emissions mitigation |  | 950,000 | 950,000 |
|  | Outcome 4.1 Increased water/food/energy/ecosystem security and sharing of benefits on basin/sub-basin scale underpinned by adequate regional legal/institutional frameworks for cooperation. |  | 950,000 | 950,000 |
| **Total project costs** | |  | 1,900,000 | 1,900,000 |

1. **Project description summary**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project Objective:** The project will establish a long-term systems approach to developing, refining and applying the tools, and skills essential for identifying integrated approaches to energy, water, food, and ecosystem security in selected regions in line with the GEF 2020 strategy. | | | | | | |
| **Project Components/**  **Programs** | **Financing Type[[3]](#footnote-3)** | **Project Outcomes** | **Project Outputs** | Trust Fund | (in $) | |
| GEF Project Financing | Confirmed Co-financing |
| **1. Development of a systems analysis framework for assessing solutions to nexus challenges** | TA | 1.1. Future trends and drivers systematically explored | 1.1.1 Stakeholder-informed regional scenario design for exploring nexus challenges, drivers and solutions |  | 150,000 | 150,000 |
|  |  | Quantitative water projection i.e. Assumptions for technological change under each SSP. Assumption on solution/option based on countries capacities  ½ Post Doc Stakeholder: 28,000 \* 3 | | | |
| TA | 1.2   Method and tool developed | 1.2.1 Nexus modeling tool developed and demonstrated with preliminary results: Tool will illuminate trade-offs among sectors and explore solutions for achieving multiple development and environmental objectives |  | 700,000 | 700,000 |
|  |  |  | 1 post doc (modeler WAT group) i.e. Ted  56,000 \* 3  1 for GIS work, infographics: 40,000 \* 3  Cross programm  2 people for cross-program web design, web application 112,000 \* 3  Computing: Cluster for running models:  500.000 (I put in a rather big amount, because I think we need to invest here) | | | |
| **2. Pilot studies: Regional nexus solutions in the context of global developments** | TA | 2.1 Understanding of sectorial trade-offs, synergies, and solutions for meeting nexus challenges improved among regional stakeholders | 2.1.1 Tangible strategies for improving regional decision-making across sectors identified for two selected regions. |  | 255,000 | 255,000 |
| TA | 2.2 Multi-sectorial vulnerability hotspots under different socioeconomic and hydro-climatic scenarios identified | 2.2.1 Global assessment of multi-sectorial hotspots and transformation pathways  2.2.2 Identification of knowledge and data gaps that would improve future assessments |  | 195,000 | 195,000 |
|  |  | 1 post doc: From Indus/Zambezi basin for stakeholder meeting organization, water related issues, capacity building  (Topic 2 and 3)  56,000 \* 3 | | | | |
| **3. Capacity building and knowledge management: Building the foundation for a knowledge and capacity network on nexus decision support** | TA | 3.1 Multi-level stakeholder engagement established | 3.1.1 Connections and interactions among stakeholders from a wide array of institutions and sectors established, including formation of an advisory board  3.1.2 Engagement of stakeholders in the design, development, and communication of regional case studies |  | 155,000 | 155,000 |
| TA | 3.2 Capacity building: Regional capacity for nexus assessment and solution identification improved | 3.2.1 Foundation of a regional knowledge and capacity network for systems analysis and nexus decision support established |  | 125,000 | 125,000 |
| TA | 3.3 Knowledge dissemination: Infrastructure established to disseminate findings of the project | 3.3.1 Dissemination of project outcomes through publications, events, and data sharing |  | 75,000 | 75,000 |
| **4. Monitoring & Evaluation** | TA | 4. 1 Effectiveness of the outputs assessed, corrective actions taken and experience documented | 4.1.1 Mid-term M&E report  4.1.2 End of project M&E report |  | 100,000 | 100,000 |
| Subtotal | | | |  | 1,750,000 | 1,750,000 |
| Project Management Cost (PMC)[[4]](#footnote-4) | | | |  | 150,000 | 150,000 |
| **Total project costs** | | | |  | 1,900,000 | 1,900,000 |

1. **confirmed sources of** [**Co-financing**](http://www.thegef.org/gef/policy/co-financing) **for the project by name and by type**

Please include evidence for [co-financing](http://www.thegef.org/gef/policy/co-financing) for the project with this form.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sources of Co-financing** | **Name of Co-financier** | **Type of Cofinancing** | **Amount ($)** |
|  | UNIDO |  | 75,000 |
|  | UNIDO |  | 375,000 |
|  | IIASA |  | 1,450,000 |
| **Total Co-financing** |  |  | 1,900,000 |

1. **Trust Fund Resources Requested by Agency(ies), Country(ies) and the Programming of Funds**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **GEF Agency** | **Trust Fund** | **Country**  **Name/Global** | **Focal Area** | **Programming of Funds** | **(in $)** | | |
|  |  |  |  |  | **GEF Project Financing** (a) | **Agency Fee** a) (b)2 | **Total**  (c)=a+b |
|  |  | Global |  | Cross-Cutting Capacity | 950,000 | 90,250 | 1,040,250 |
|  |  | Global |  | Cross-Cutting Capacity | 950,000 | 90,250 | 1,040,250 |
| **Total Grant Resources** | | | | | 1,900,000 | 180,500 | 2,080,500 |

a ) Refer to the [Fee Policy for GEF Partner Agencies](http://www.thegef.org/gef/sites/thegef.org/files/documents/document/gef-fee-policy.pdf)

1. Project ID number remains the same as the assigned PIF number. [↑](#footnote-ref-1)
2. When completing Table A, refer to the excerpts on [*GEF 6 Results Frameworks for GETF, LDCF and SCCF*](https://www.thegef.org/gef/sites/thegef.org/files/documents/document/GEF6%20Results%20Framework%20for%20GEFTF%20and%20LDCF.SCCF_.pdf). [↑](#footnote-ref-2)
3. Financing type can be either investment or technical assistance. [↑](#footnote-ref-3)
4. For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.  
    [↑](#footnote-ref-4)