



Efficient Management of Wastewater Treatment and Reuse in the Countries: Jordan, Palestine, Lebanon and Turkey,

“EMWater Project”

RMSU Meeting 05 – 07.12.05. Dead Sea, Jordan

Andreas Bethmann / Project Manager

InWEnt - Capacity Building Int., Germany



This Project is
funded by the
European Union



Overview:-



- **Introduction of InWEnt**
- **Water and wastewater situation in the MEDA countries**
- **EMWater project objectives**
- **Activities**
- **Results of the capacity building program**
- **Conclusions**



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InWEnt: Internationale Weiterbildung und Entwicklung gGmbH

Capacity Building International, Germany



**Merger between
Carl Duisberg Gesellschaft (CDG)
and
German Foundation for International
Development (DSE)
in 2002**

**A German governmental organisation for international
capacity building and sustainable development**



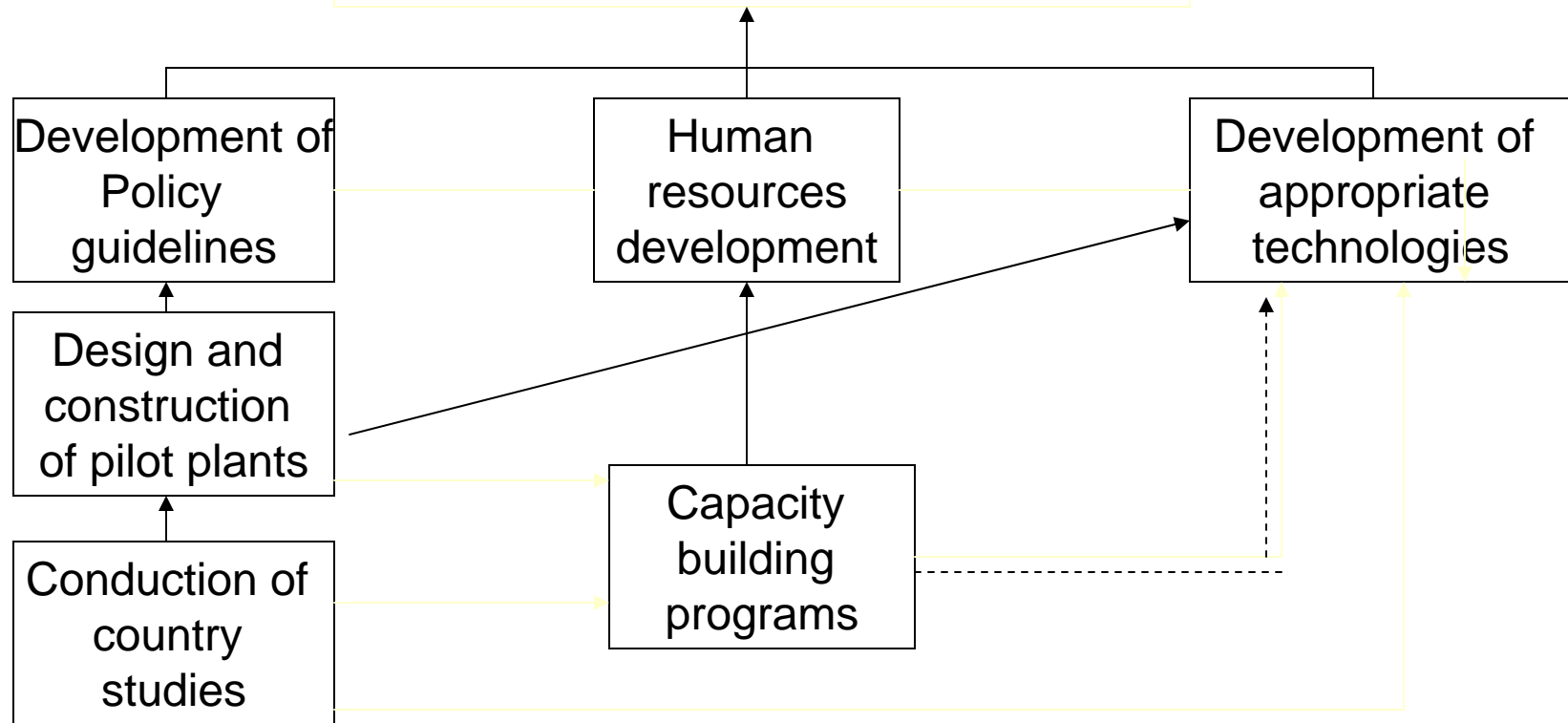
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Objectives of the EMWater Project



Efficient management of wastewater Treatment and Reuse in the MEDA Countries is increased



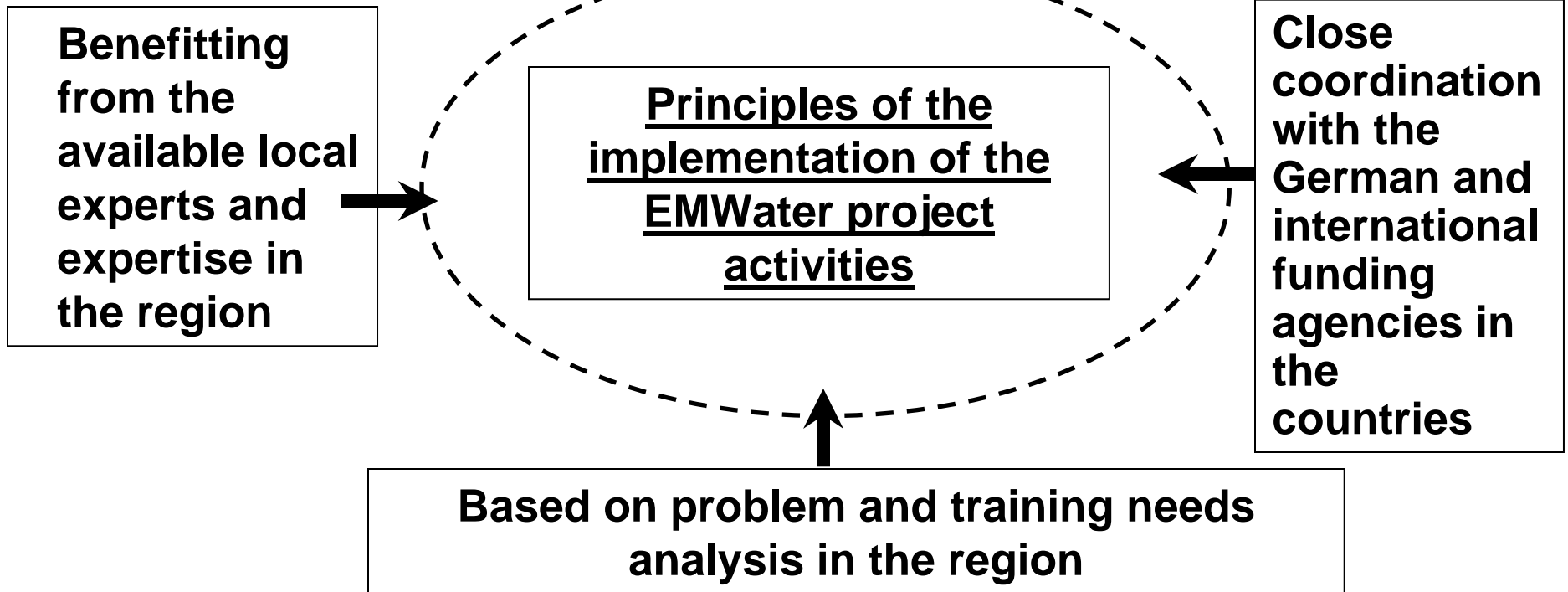
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EMWater Project 2003-2007



Very close cooperation and coordination with the partner organizations in the countries



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Partners



Europe



Internationale Weiterbildung und Entwicklung gGmbH

InWent - Capacity Building International, Germany



Adelphi Research Berlin Germany



Hamburg University of Technology Germany



ENEA, Bologna Italy



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MEDA



Lebanese American University, Byblos Lebanon



University of Balamand, Tripoli Lebanon



Yildiz Technical University, Istanbul Turkey



Birzeit University, Birzeit Palestine



Al al Bayt University, Al Mafrq Jordan



Internationale Weiterbildung und Entwicklung gGmbH

Activities of EMWater Project



Planned 2003 – 2007

- Training needs assesment**
- Conduction of country studies**
- Conduction of local, regional, E-learning and public awareness programmms**
- Design and construction of 5 pilot plants for WWTR**
- Elaboration of policy guidelines for WWTR**
- Organisation of a regional conference in 2006**



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Activities of EMWater Project



Implemented Activities 2003 – 2005

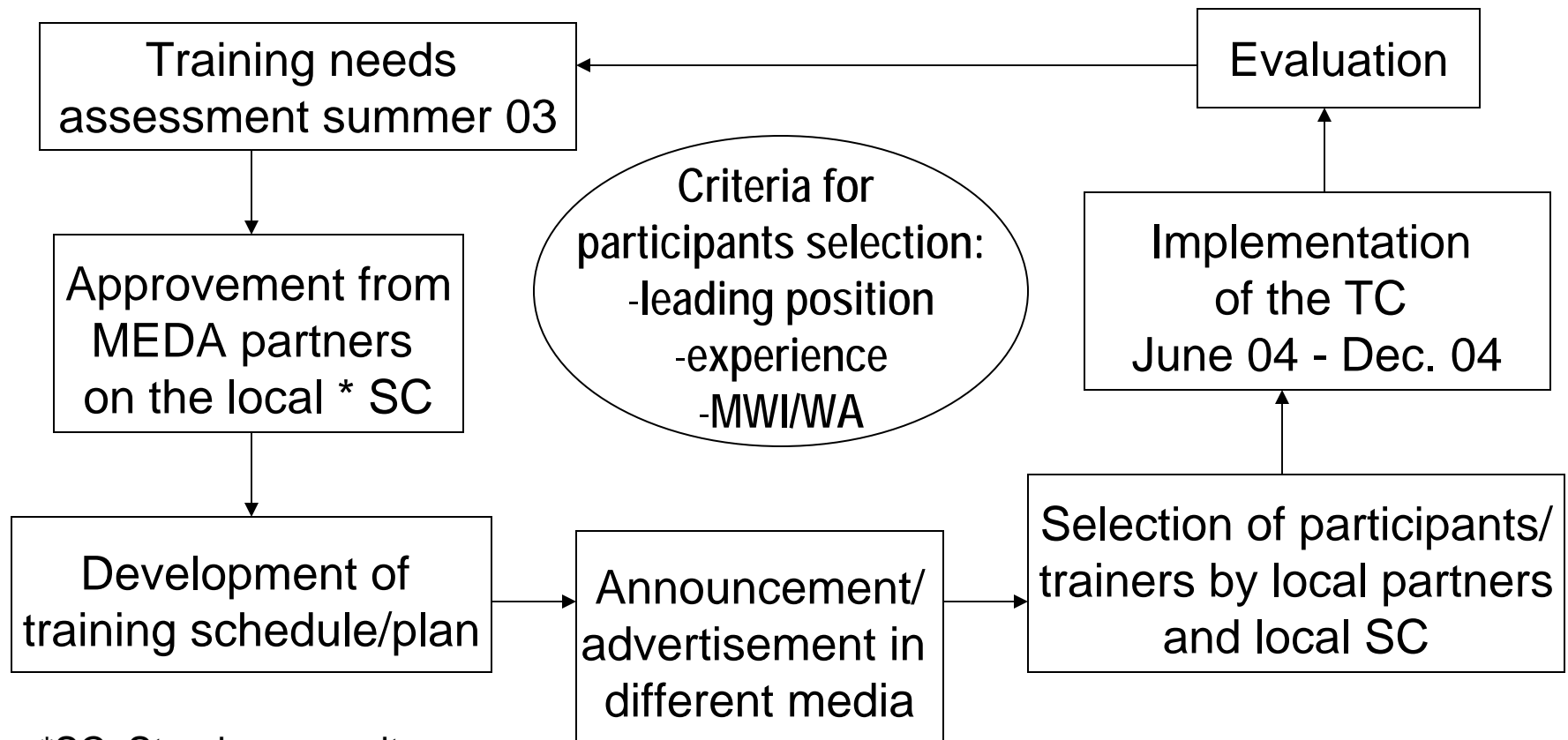
- Training needs analysis**
- Country studies conducted and published**
- Training programs for 2004 and 2005 were conducted**
- Design and construction of pilot plants have started**



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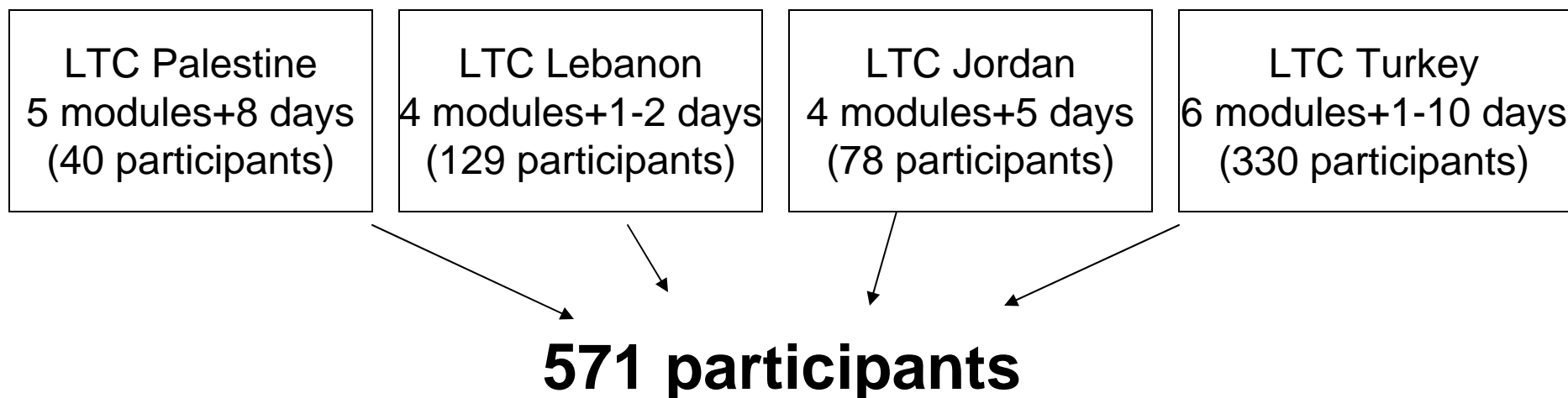


The Capacity Building Program Implementation Procedure



*SC: Steering commitees

Local Training (LTC) 2004



Regional Training (RTC) and E-learning Courses 2004

**Regional training course
in Jordan
3 modules, 3-5 days each, 39 Participants**

**E-learning course,
4 modules
(16 participants)**

**Total: 26 Modules in the year 2004
626 participants**

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Ongoing Capacity Building Programs in 2005

LTC
Jordan, Palestine,
Turkey and Lebanon
Each Country: 4 modules /
40 participants

July-Dec. 2005

RTC Lebanon
3 modules /
40 participants

Nov. 2005

E-Learning Course
4 modules /
40 participants

Sept. – Nov. 2005

Design and Construction of the Pilot Plants Lebanon and Jordan



Country	Treatment Technology	Details of Treatment
Lebanon 2 x pp	Contact Stabilization Sludge	<pre> graph LR A[Aeration 1-24] --> B[Screening Tank Gravel Steel] B --> C[Balancing Tank] C --> D[Contact Aeration Tank] D --> E[Setting Tank] E --- F[Chlorination] E --- G[Sludge Re-aeration] E --- H[Sand Filter] E --- I[Sludge Aerobic Digester] E --- J[Active Carbon Filters-Reuse Purposes] </pre>
Jordan 1 x pp	Activated Sludge Treatment	<pre> graph TD A[Sanitary sewer network] --> B[Screening Unit] B --> C[Biological Treatment] C --- D[Pre-Dinitrification] C --- E[Aeration] C --> F[Sludge stabilization tank] F --> G[Filtration tank] G --- H[Rapid filter 15 m³/m²] G --- I[Option: Wetland filtration] G --> J[Chlorination] J --- K[Option: UV-light] J --> L[Irrigation tank] </pre>



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Design and Construction of the Pilot Plants Turkey and Palestine



Country	Treatment Technology	Details of Treatment			
<p>Turkey</p> <p>1 x pp</p>	<p>Anaerobic Baffled Reactor Followed by Rotating Biological Reactor (ABR – RBC)</p>	<p>*UASB Principle ABR Reactor</p>	<p>RBC Reactor</p>	<p>Settlement Tank</p>	<p>Tertiary Treatment Wetland – Reuse Purposes</p>
<p>Palestine</p> <p>1 x pp</p>	<p>Ditto</p>	<p>Ditto</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> <p>Tertiary Treatment Sand Filtration</p> </div>			

UASB: Upflow Anaerobic Sludge Blanket

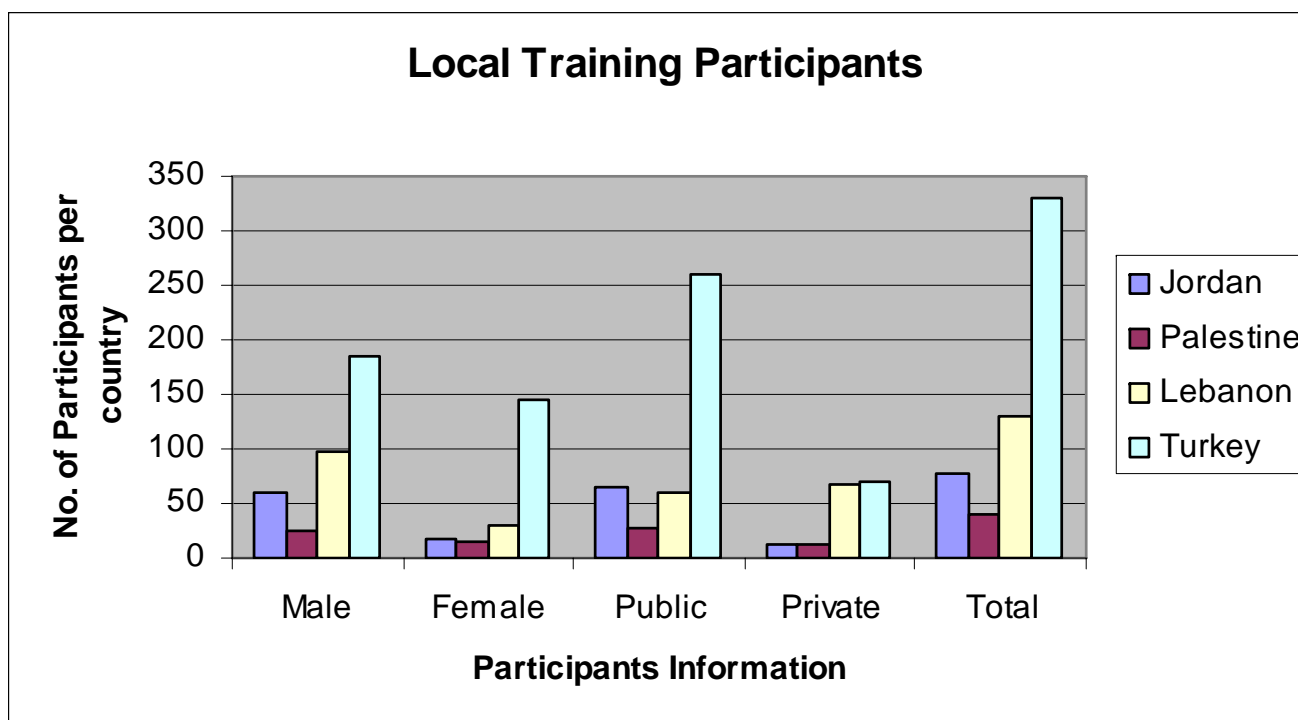


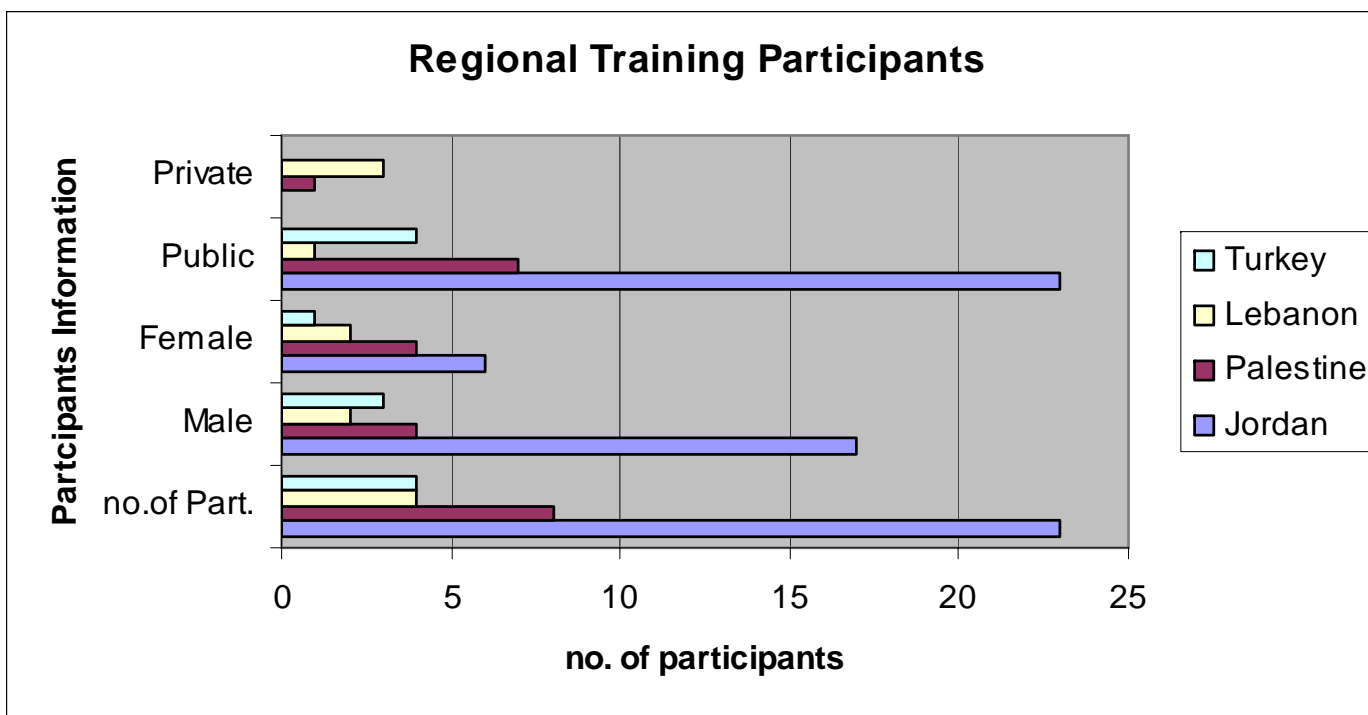
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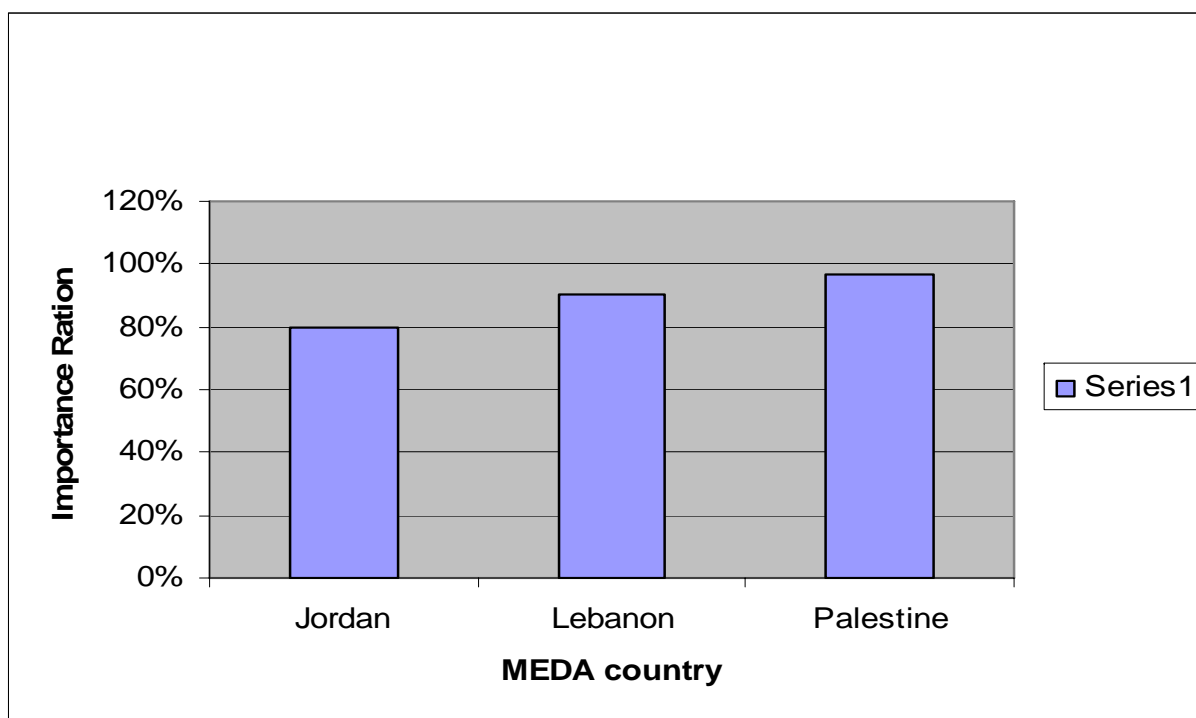


Summary of main topics offered by the different modules

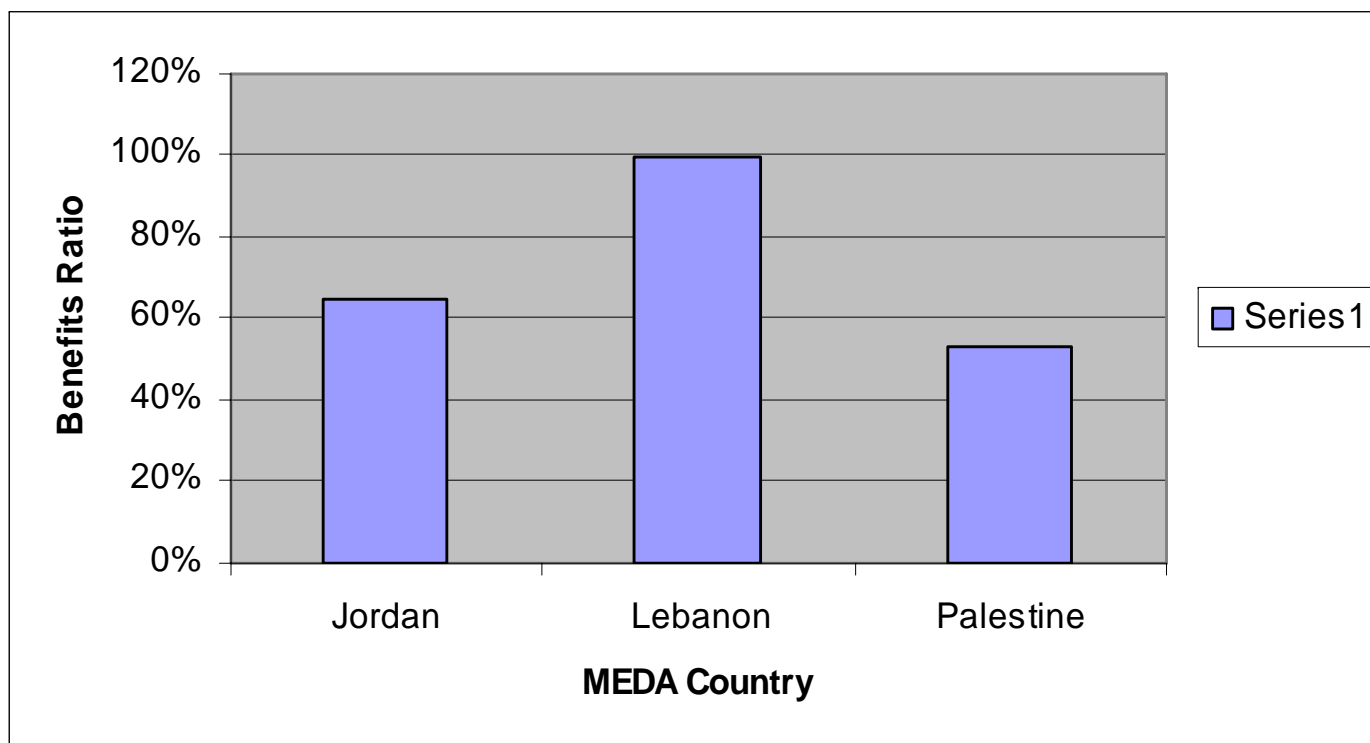
- **Operation and maintenance of WWTP**
- **Low cost technology of WWTP**
- **Wastewater quality control**
- **Environmental impact assessment**
- **Institutional and project management**
- **Reuse aspects / policy guidelines**







* **Turkey data is not available**



*** Turkey data is not available**

Sustainable impacts of project results

- **Activities implementation of the EMWater project in the last 2 -3 years are running well and are strongly supported by all partners.**
- **Communication with potential donor organisations and EU MEDA water projects is functioning well.**
- **More than 700 participants from the region have successfully attended the training courses we have offered in the last 2-3 years, target group mostly municipality wastewater engineers**
- **Evaluation of wastewater situation and the publication of country studies in scientific journals well be done (Slide 1 of 2)**

Good involvement of stakeholders in the planning and implementation of project activities

- **Through the construction of pilot plants long term positive impact of project activities will be achieved.**
- **Good networking in research and capacity building between EU and MEDA partners was achieved – master and PHD programs LAU/TUHH-**
- **Good experience exchange between experts in the MEDA countries through regional and online training course has been achieved.**

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First Regional Training Course Al Al Bayt University / Jordan October, 2004