BRAZIL: FLOOD MANAGEMENT IN METROPOLITAN CURITIBA AREA

1. **Location of the study**: The Metropolitan Area of Curitiba (RMC), in the State of Paraná, Brazil.

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3. **Brief description of flood management practice**

   Most of this RMC urban area, with some 2.5 million inhabitants, has developed in the Upper Iguaçu River Basin, which has a catchment area of some 1000 km². There are a number of tributaries with basin areas of about 100 km². The highest urban concentration is in the Belem Basin and other neighboring basins.

   In RMC there are two types of floods: due to urbanization, which occur mainly on the tributaries of the Iguaçu River; and due to low river capacity, flood plains' occupation by the population, flow obstruction due to urban works such as bridges, landfill and inefficient drainage projects.

   As a component of an overall program dealing with environmental impacts on the Metropolitan area of Curitiba, the conceptual approach used was: to (i) create a space for flow and storage in the flood plain of the main river (Iguaçu); (ii) develop a way to control the population invasion of the flood plain; and (iii) develop the Urban Drainage Master Plan for the Metropolitan Region for the tributaries.

4. **Key issues**

   Urban Flooding is one of the major threats to cities, particularly in those with a rapid and uncontrolled population increase. Integrated Urban Drainage and Flood Plain Master Plans are the main instruments to assist in the development of a sustainable policy to manage flood impacts in urban areas.

   Urban flood management also requires evaluation of socio-economic issues related to land use and urban development. Most of the measures can be developed and implemented through legislation, its enforcement, public participation and capacity building.

5. **Relevance to the concept of IFM**

   The study covers the following aspects of IFM to varying extents:

   **Integration of land and water management**
   - Aspect 2 - Land and water management
   - Aspect 3 - Laws and regulations for flood and water management
   - Integrated river basin management approach to flood

   **Best mix of strategies**
   - Aspect 10 - Best mix of structural and non-structural measures

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Integrated hazards impact mitigation

- Flood plain maps and zoning
- Early warnings and forecasts

6. Comments

(i) Potential strong points of the case study

- Information on the approaches and flood management measures taken to protect a densely populated urban area of Brazil.
- The conceptual and structural measures to control and prevent population invasion of reserved flood storage areas.

(ii) Potential for practices mentioned to be transferred/applied to other regions with geophysical and socio-economic characteristics)

- The experience presented in the case study could be transferred to other fast-growing urban cities, particularly in the developing world.