

TECHNOLOGICAL LEAPFROGGING

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- **Technology**
- **The notion of technological leapfrogging**
- **Prerequisites to undertake technology leapfrogging**
- **Analytical support to technological leapfrogging undertaking**
- **What is to be realized?**
- **Suggested areas for technological leapfrogging**
- **Addressing the poverty-energy-environment problem through technology leapfrogging**

TECHNOLOGY

- **Technology**
 - Prescriptive information
- **Technological system**
 - Things that comes out (created) if a technological prescription is followed through
- **Main characteristics of technology and technological system**
(see next slide)

TECHNOLOGY

- **Main characteristics of technology and technological system**
 - **Technology is problem solving oriented**
 - **The functioning of technological system is dialectic by nature**
 - **The development and the functioning of technological system is socially constructed and society shaping**

THE NOTION OF TECHNOLOGICAL LEAPFROGGING

- **Technological leapfrogging is an approach to undertake a development undertaking, i.e. changing the societal condition from one state to another state, considered to be better, whereby:**
 - **The change takes place rapidly**
 - **The process is facilitated by the functioning of a certain technology which can be clearly identified as the major factor for the change**

THE NOTION OF TECHNOLOGICAL LEAPFROGGING

- **The previous formulation refers to technology leapfrogging by design**
- **There are also technology leapfrogging phenomena that take place that is predominantly by default – the case of ICT**

PREREQUISITES TO UNDERTAKE TECHNOLOGICAL LEAPFROG

- **There have to be an actor or group of actors who**
 - **master the underlying knowledge and the ‘*idiosyncrasies*’ of the technological system that is to play as the major facilitating role in the leapfrogging development approach**
 - **persistently promote and drive the idea**

PREREQUISITES TO UNDERTAKE TECHNOLOGICAL LEAPFROG

- **There has to be a clear idea about the consequences of the undertaking:**
 - **In terms of resources that needs to be deployed**
 - **In terms of possible societal responses to the change (*remember the dialectic nature of the functioning of technological system*)**

PREREQUISITES TO UNDERTAKE TECHNOLOGICAL LEAPFROG

- **There has to be a clearly defined goal for the undertaking and a clear strategy to realize the goal**
- **There has to be an understanding about the policy climate that needs to be established**
- **There has to be a solid and widespread political support to the undertaking**

ANALYTICAL SUPPORT TO TECHNOLOGICAL LEAPFROGING UNDERTAKINGS

- Modeling and simulation to explore possible future scenarios (*'futurables'*)
- Sophisticated approaches and techniques for program & project design, control, and evaluation

WHAT IS TO BE REALIZED

- **While the change created through technological leapfrogging is fast, the processes leading to the realization of the undertaking have to be well thought and it takes time.**
- **A proponent for the “TL” approach have the faith and patient for the process to happen**

SUGGESTED AREAS FOR TECHNOLOGICAL LEAPFROGGING

- **Institutionally directed technology leapfrogging**
 - **Paradigm shift to position ecological considerations at central position (Emil Salim)**
 - **Institutionalization of processes for the *industrialization of intelligence***

SUGGESTED AREAS FOR TECHNOLOGICAL LEAPFROGGING

Industrially directed technology leapfrogging

- Improving and industrializing agricultural activities and products through the wide spread functioning of biotechnology, delivering food, medicine, materials, energy**
- Production and delivery of low C-intensity coal based fuels through the implementation of clean coal technology**
- Shift from the functioning of combustion based prime movers towards electrochemical based prime movers in vehicles**
- Implementation of novice technological system to produce clean and potable water**

SUGGESTED AREAS FOR TECHNOLOGICAL LEAPFROGGING

- **Societally directed technology leapfrogging**
 - **Wide spread ICT support to education**

ADDRESSING THE POVERTY-ENERGY-ENVIRONMENT PROBLEM THROUGH TECHNOLOGY LEAPFROGGING

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Thank you