

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: PAST AND FUTURE



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THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Introduction

- Since 1960, the water issue has been quoted as the second biggest problem of the island after the political problem
- The water sector has received the largest part of government investment for development in the last 40 years
- Cyprus can today claim to be
 - among the first in dam capacity per capita
 - among the first in its aquifers utilization
 - among the most advanced in terms of evaluation of its available water resources,
 - an advanced user of water efficient irrigation systems
 - and with a populace that is well aware of its water problems
- Very frequently Cyprus is quoted as an example of a success story for water development and management

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Introduction



Qualification of this impression and what are the realities and the problems associated with it, will be the main topic of this presentation

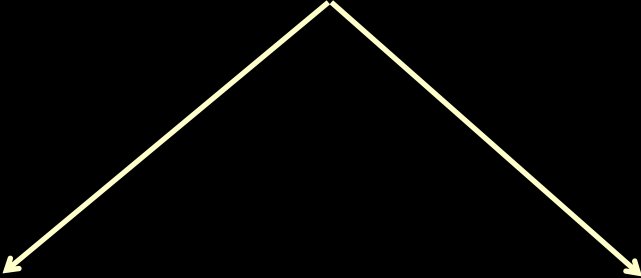
THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Introduction

Questions attempted to be addressed:

- Is the apparent lack of adequate water a real problem or one created by poor planning and by overextended use of available water resources?
- Should we have concentrated our policies more on managing demand, changes in legal, economic and other institutional aspects rather than on costly water projects?
- How do we cope with the growing tourism demand and its competition with the agricultural sector on water and other resources?
- How will the implementation of the European Water Framework Directive help in the improved management of the island's water resources and what implications and repercussions will it have?

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Introduction

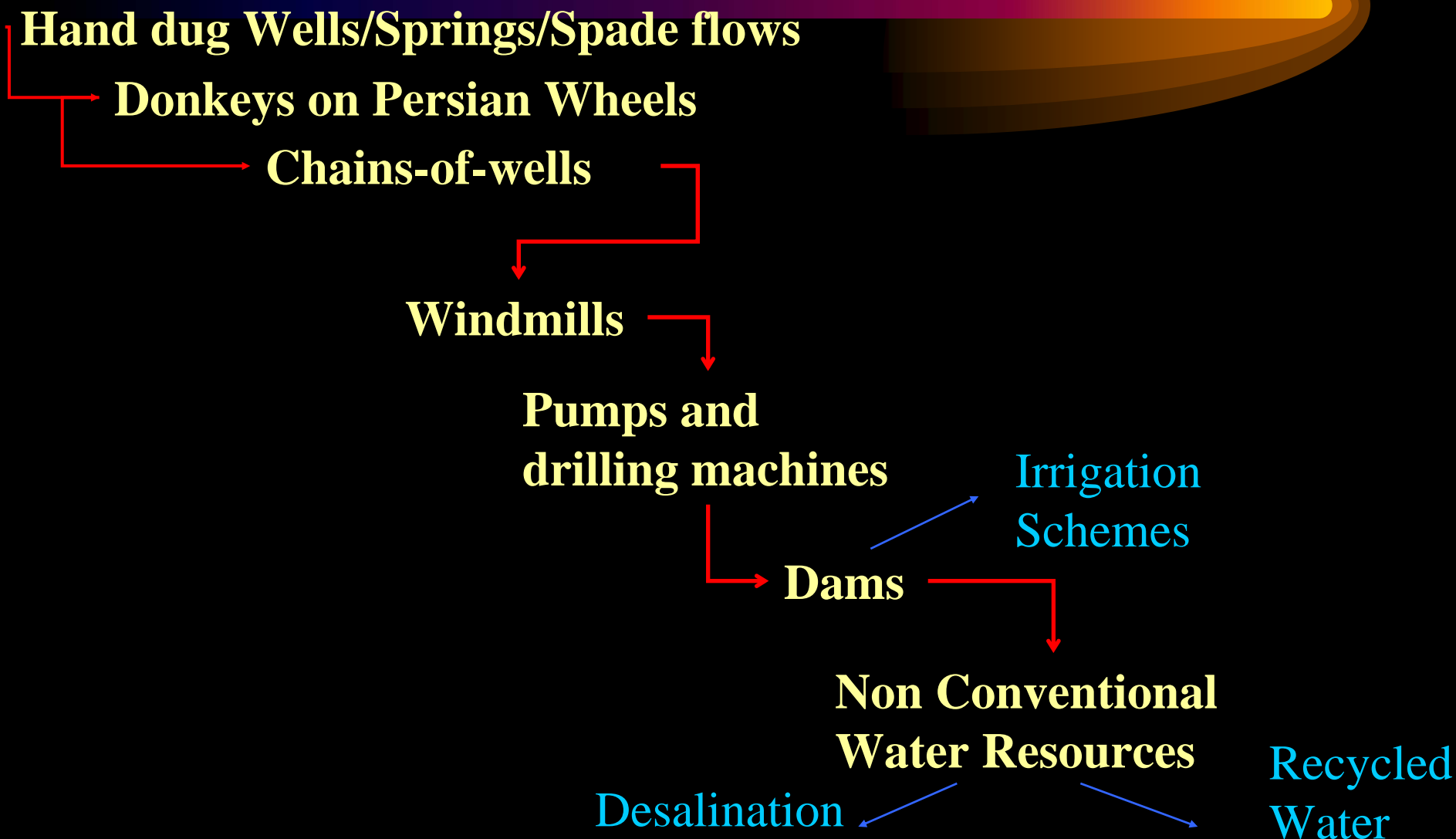
The premise of this presentation revolves around two basic positions :



A. That the human right to water is indispensable for leading a life in human dignity

B. That water scarcity is so much a supply challenge as much as it is a good governance and water allocation challenge

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Water Development Timeline



THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The Past



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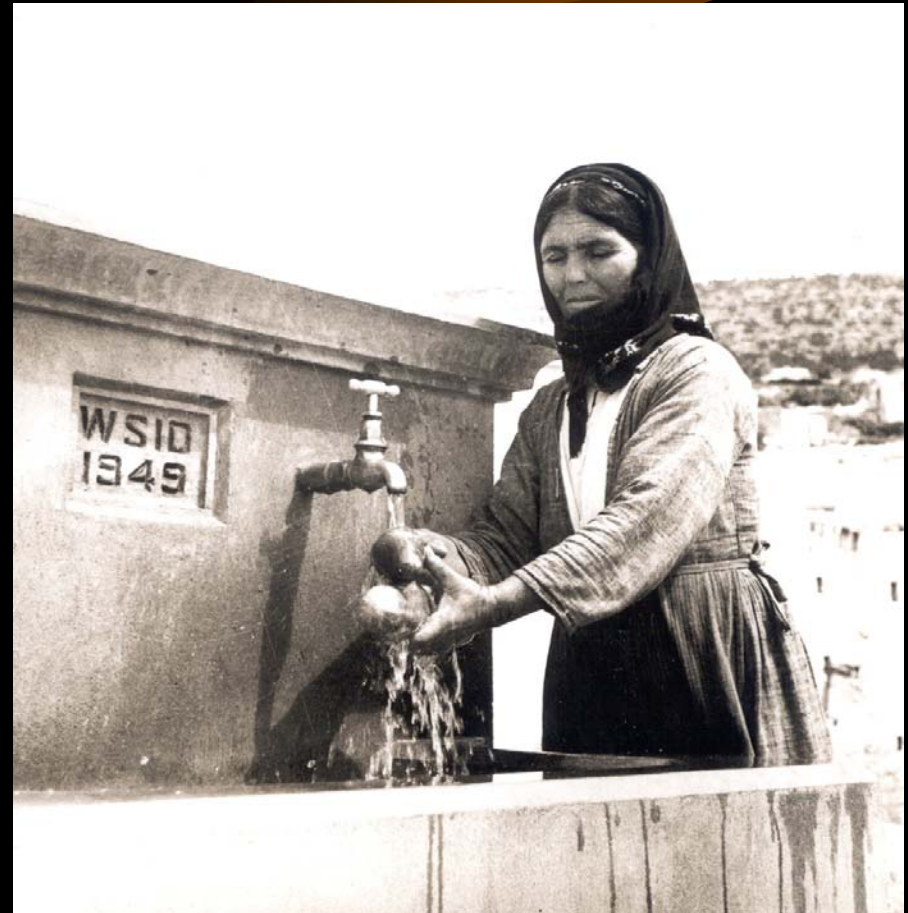
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THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Today



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THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Critical Thought

Has the enthusiasm for developing the water resources and helping the economy, overshadowed other considerations such as:

- environment,
- repercussions on water resources,
- changes in agricultural practice,
- changes in political conditions affecting exports or imports,
 - sectoral changes such as tourism versus agriculture
 - and many others?

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: More Facts

- The registered number of boreholes is in excess of 50000 throughout the island
- In the late 40s and the 50s the Government was carrying out all the drilling, and private boreholes were heavily subsidized
- Private drillers appeared in the late 50s and with them illegal drilling started to become a serious problem. The first indications of groundwater mining and sea intrusion started appearing
- Under the motto of the '60s “Not a drop of water to the sea” Cyprus became one of the countries with the highest degree of dam development in the world

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: More Facts

- The construction of the Paphos and the Khrysoxhou irrigation projects and especially the Southern Conveyor enabled wide area water management
- The implementation of these water projects transformed the commanded land radically and lands that were never irrigated before found themselves with a hydrant valve and an access road
- Land consolidation and modern irrigation systems were promoted, new plant varieties were introduced and modern agriculture had come to stay
- At the same time tourism started expanding dramatically outpacing all other sectors of the economy and competing for labor and resources

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: More Facts

- Increase of standard of living, expanding tourism and the extraordinarily prolonged drought of the 90s caused more of available water resources being primarily committed for drinking purposes rather than agriculture
- Commitments made for agriculture could not be fully met or continued
- All best sites for dams that engineering can construct have been completed,
- Desalination and reuse of treated waste water were thought to be required to come in stream after the 2010 time horizon. Nonetheless, these became part of the water policy as early as the mid 90s

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: More Facts

- Aggravated water scarcity in the 1990's and the deficient situation of water supply for domestic use, including the growing tourist sector, necessitated swift and decisive measures to ensure a stable and continued supply of good quality drinking water. This could only be done through seawater desalination.
- The measure was successful in providing to the domestic sector, including the economically important tourist industry, a steady supply. However, considering that close to 70% of all water resources on Cyprus are used by agriculture, a sector that contributes only a minor part to national wealth and struggles with labor scarcity problems, a close scrutiny of water allocation policy appears to be in order

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: More Facts

- The end of the drought by 2001 brought an end to the policy of providing desalinated water to all urban centers and the plans for plants at Limassol and Paphos were abandoned. Following the very wet winter of 2004 a decision has been made to buy out the Dhekelia plant, rehabilitate it with new technology and operate it on demand.
- At present only about 3 million cubic meters of tertiary treated sewage effluent is used for agriculture and landscape irrigation. The crops irrigated with recycled water are citrus, olives, vines and fodders. It is estimated that by the year 2012 an amount of approximately 30 million m³ of treated sewage effluent will be available for agriculture and landscape irrigation.

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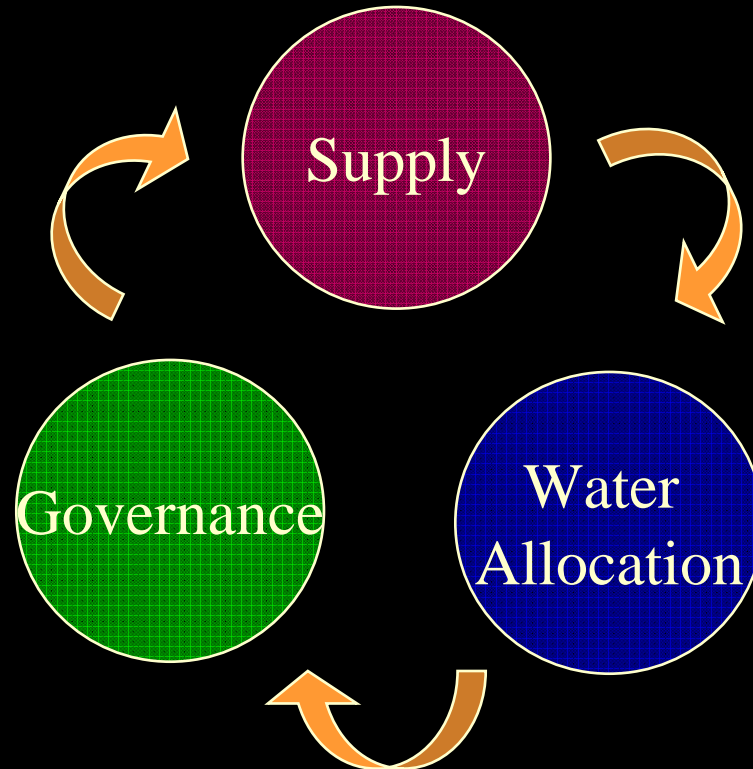
- The water development efforts made in the past 50 years and the agonizing and continuous effort in harnessing the water resources of the island and satisfying the ever growing thirst within a practically arid environment has been shown
- Huge investments have been made to this end but yet, the water scarcity problem is far from being solved and an uninterrupted supply having been secured
- Obviously, water scarcity is not only a supply challenge but also a good governance and water allocation challenge
- Water management in Cyprus has met difficulties owing to the inherited legal and institutional framework

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT

- The entry of Cyprus into the European Union gave a new impetus in solving these problems but to this moment no final decisions have been taken
- New legislative measures harmonizing the Cyprus legislation to that of the EU may be complicating matters even more since there does not appear that these are accompanied by the required staffing to meet the new requirements
- Most of the problems arise from the fragmentation of jurisdiction in the planning, design, implementation and control of the water resources management

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Water Management

Cyprus Water Management Challenges



THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The supply challenge

The built water infrastructure has been the result of master-plans, extensive and comprehensive feasibility studies and sound workmanship;

The experienced problems associated with this development are:

- The creation of new demands in order to achieve economically sound projects
- The exclusion of the dry weather conditions in the design of the infrastructure
- Lobbying by farmers and political pressure
- Water pricing and subsidies resulted in the over-exploitation of the aquifer systems, the reduction of their yield, sea-intrusion and groundwater quality deterioration.
- The decisive reduction of natural recharge to downstream aquifers due to the cut-off effected by the dams (“not a drop to the sea”)

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The supply challenge

- The cropping pattern within the commanded areas followed the market trends rather than what was envisaged at the planning stage, resulting to high water demanding crops such as bananas rather than table-grapes
- One should have been more prudent in view of the arid to semi – arid nature of the climate of the island and the unavoidable recurrence of drought spells. The devastating results of the above were felt with the occurrence of the drought spell of 1990 onwards.
- the lack of labor and the development of the tourist industry in certain areas did not allow the development of agriculture as planned
- The unforeseen increase in tourist development in certain areas (south-eastern Cyprus) created a water demand that could not be met .
- The domestic water tariff is way below the cost of desalinated water (CY£ 0.45 or 0.77 € as opposed to CY£ 0.62, or 1.0 € per m³)

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The supply challenge

- The recycled water is a growing resource in Cyprus. Its acceptance for irrigation is far from certain as yet especially when there is alternative water available. Adjustment of pricing will encourage its use
- Seawater desalination has ensured a continued supply of good quality drinking water for domestic uses, including the economically important tourist industry. However, it represents a trend that leads the island's water security into dependence on oil imports for desalination.

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The governance challenge

- Efforts for creating a single Water Authority and the amalgamation of legislation have been under discussion in the past 40 years without a clear decision on the matter.
- The staff that took part in the development studies of the water infrastructure has retired without adequate replacement. Hiring of young personnel has been very limited. The impetus gained during the planning and implementation stage has been lost for the management stage.
- The implementation of the Water Framework Directive and other EU Directives with the added data and decision requirements with the present level of staff available becomes a very difficult task

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The governance challenge

- Environmental concerns during the 60s to 80s were sluggish and many waterworks did not take account seriously the effects of these structures to downstream users .
- Public participation sessions and efforts with all stakeholders were minimal and this affected the degree and manner of involvement of farmers in the development of projects and to the adherence to cropping patterns and other particularities of the water projects .
- Outsourcing of many of the State's water resources management activities has only recently started to be made. This has to expand to activities such as monitoring and data collection

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The governance challenge

- Groundwater management has failed to meet the expectations of maintaining sustainability and strategic reserves to help mitigate effects of drought spells.
- Groundwater supplied most of the water needed before the construction of surface dams and still provides some 50 percent of the demand. In general, all the aquifers are overexploited, some are depleted to 15 – 20 percent of their original reserves, coastal aquifers are sea-intruded to varying extents and their yield reduced. In the last 50 years the aquifers have been thoroughly studied, modeled, surveyed, and in some of them all the extraction is metered. Special legislation for their protection has been enacted and new drilling permits are issued after considerable scrutiny. Nonetheless, the aquifers have reached their present undesirable state

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The governance challenge - What caused this state of affairs

What caused this state of affairs:

- Well permits are issued by the District Officer with the concurrence of the Water Development Department in the main aquifers and without, in the rest of the areas.
- Social reasons, existing irrigation commitments and similar criteria are decisive on issuing a permit.
- Illegal drilling (in some aquifers 50%) and illegal pumping do not carry sufficient penalties and the control is sluggish. Social aspects and political pressures make this problem quite difficult to deal with. It is obvious that farmers do not necessarily subscribe to the principles of sustainability but rather to personal income.

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The Water Allocation Challenge

- 70% of all water resources on Cyprus are used by agriculture
- Agriculture contributes only a minor part (less than 5%) to national wealth and struggles with labor scarcity problems and marketability of produce (correct pricing is needed)
- Users of government owned water systems pay the established tariff, while owners of wells do not
- An increase in water tariffs in the public systems is bound to encourage further overexploitation and mismanagement of groundwater
- Thus concept of equity among farmers does not exist. Realizing a policy of uniform water rates over the island remains a difficult problem.

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The Water Allocation Challenge

- Water use efficiency (water used per ton of crop) is reasonably good
- New Water policies with incentives and disincentives that would conciliate water availability with demand are required. These will ensure that adequate food security and rural targets are achieved in exchange for the substantial subsidy the sector is receiving
- Review of water allocation criteria and tariffs are in order

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The Water Framework Directive



“the biggest challenge will be the compromise between conflicting and competing uses and at the same time protecting the resource and using it in a sustainable manner”

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: The Water Framework Directive

Implementation of WFD might be lingered due to:

- Insufficient quantitative and qualitative data required for the initial crucial steps in implementing the Directive
- Lack of a rationally organized national network for observation and collection of information as well as the lack of a unified database
- Difficulties in the coordination among the responsible authorities and all the other involved agencies
- Limitation in sufficient expertise and appropriate human potential and necessary technological means
- The attitude of water users
- High implementation cost
- Fragmentation of responsibilities, jurisdiction and lack of a unified Water Authority

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Concluding Remarks

- Besides the miraculous development, pressure on water resources by tourism, agriculture and standard of living under the arid conditions, continues to increase
- Improving management of existing water resources and of development of whatever quantities can still economically be developed, is needed
- Water demand management, reallocation of supply, change of cropping patterns and reduction of losses, are some other options

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Concluding Remarks

- Groundwater needs to recover to help mitigate future water shortages.
- It has been shown that the water crisis is as much the creation of nature as it is of man. The water crisis has been aggravated by the greed of some and the indifference of many
- It is as much the result of shortcomings in human rules and regulations as much as nature's resources
- Rather than change the institutions, legal framework and manage the demand, Government pursued a continuous effort to increase the supply for the local entities that have looked to government to solve their self-imposed crises..... Politicians and bureaucrats have been only too willing to exploit the void and further compound the crises.

THE CYPRUS EXPERIENCE IN PLANNING WATER RESOURCES MANAGEMENT: Concluding Remarks

- A serious review is needed for the water policies, the water management set up, the water prices, the water demand, the water allocation matrix, the environmental ramifications of water use and the public participation in these efforts
- The speaker was involved throughout the most important period of the water development planning and implementation in the island (1966 to 2002) and has his share for whatever went wrong
- It is so easy to criticize after the effect.

Thank you for your Attention!!!