

**Watershed Management**  
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**Lecture No. #19**  
**Social and Community Aspects of Watershed Management**

[FL] and welcome back to the video course on watershed management. Today we will start a new module – module number 5. So, the module title is socio economic aspects of watershed management. In this module we will discuss - social aspects of watershed management, community participation, private sector participation, institutional issues, socio economic aspects, integrated development, water legislation and implementation and some case studies.

So, in today's lecture – lecture number 19 we will discuss mainly social and community aspects of watershed management. So, the topics covered in today's lecture include - social aspects of watershed management, community participation, community based watershed management and institutional issues. Some of the key words for today's lecture include - social aspects, community participation and institutional issues.

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**WATERSHED MANAGEMENT**

**L19-Social & Community Aspects of Watershed Management**

- **Topics Covered**
  - Social aspects of watershed management, Community participation, Community based watershed management, Institutional issues.
- **Keywords:** Social aspects, Community participation, Institutional issues.

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**WATERSHED MANAGEMENT**

**Watershed Management - Perspectives**

- **Past Traditional and Current Development Approaches**

Development elements	Traditional approach	Current approach
Purpose	Single (Soil conservation)	Multiple (Social, economical and environmental)
Need assessment and planning	Central level government staff	Community help to identify the gap and select the priorities
Strategy	Increase production and conservation	Emphasis on livelihoods, poverty and sustainability
Approach	Centralise, Top-down planning with little input from community	Participatory, community based focus to the women and poor communities
Institution	Government and donor agencies	NGO, community based organization (CBO) and private and Governments institutions
Working Size	Large watershed	Small watershed, sub watershed
Output	Target meet, quantities	Qualitative, sustainability

Source: Peraz and Tschinkel, 2003; WFP, 2002

NPTEL et al., (2008) The Journal of Agriculture and Environment Vol. 9, Jun.2008

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So, as we discussed earlier, so watershed management means, so we are say dealing with various aspects of the total aspects within the watershed including all resources, including say natural resource like land, water, then minerals and then agricultural aspects. So, in all these things, so the, the human beings are very much involved; the people staying in that area is very much involved.

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**Watershed Management - Perspectives**

■ Past Traditional and Current Development Approaches

Development elements	Traditional approach	Current approach
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So, that way, so watershed management is always a social issue. So, that way, when we discuss about the watershed management, say when we discuss, what was, what we are doing last say few decades back? And now, presently, what you are doing? Let us have a look into past and past traditional and current development approaches. So, what are the changes? So, these, what was happened in last 30 or 40 years? Say, for example, if you take various aspects like development elements traditional approach, what was happening? And current approach, how it is?

So, the purpose of watershed management - so, now, earlier, it was say single purpose either like soil conservation or just water harvesting or water management, but now, the current approach will be the, it is, the approach is multi multiple as we discussed earlier. So, like social aspects will be there; so, social purpose will be there; then economical purpose will be there; then environmental purpose will be there, and of course, say soil and water conservation also will be there.

And then need assessment and planning is concerned, say earlier, say either state or central government, the government level staff used to dictate times, that, we will do this at particular location or particular watershed is concerned, but now, say the recent change or the current approach is – so, community or community based approach or community helps to identify the gap and select the priorities; so, that means say various

issues whatever the necessity, of the, of the community living in that particular watershed.

So, accordingly, the various schemes are undertaken, and then, earlier times strategy is concerned, so the strategy was to increase production and conservation. So, like increase the agriculture production and then water conservation or soil conservation, but now, the current approach what we can see is - the emphasis on livelihoods, poverty and sustainability. So, that is the current approach as far as watershed management is concerned, and then, the approach is concerned, say traditional approach was, it was very much centralized top down planning with little input from community.

So, the community where absolutely not involved in earlier traditional approaches. So, from the top officials or the officials use to say decide what to do, where to do, how to do and all the design. But now, the current approach is say we are looking for participatory approach; that means according to the needs, according to the community participation, according to the people requirement only, now we are going for watershed management. So, accordingly, the community based focused like say to the women and poor communities is also involved nowadays as far as watershed management is concerned.

And then as far as institutional aspects are concerned, say the traditional approach was mainly from government and the donor agencies. Say for example, if you say like World bank or Asian development bank or whoever the donor, and then, the state central or the district level government authorities used to decide what to do, how to do and where to do as far as watershed management plans are concerned.

But now, the trend is say the generally most of the watershed management plans are developed and then implemented by non-government organizations - NGOs - and then community based organizations and private, and of course, with government institutions involvement is always there.

So, that was the, that is the change. What was happened or the current approach is like this, and then, working size is concerned, the traditional approach we used to go for large scale areas or like river basins or large scale area we use to deal in traditional approach, but now, the current approach - we look into small scale or small watershed or sub

watershed level various schemes we are trying to implement as far as watershed management is concerned.

And then as far as output is concerned, the, say always earlier traditional approach was to meet certain target like this much water should be available or say the agricultural output to be improved in terms of quantities. So, that was the traditional approach, but current approach is say we are mainly, say concentrating on sustainable development, sustainability issues, qualitative aspects and then social upliftment; I mean total development of the area or total development of the watershed. So, that way only we are concentrating as far as the current approach in watershed management is concerned.

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**WATERSHED MANAGEMENT**

**Social Aspects**

- Watershed management objective: **Social upliftment & well being of inhabitants**
- **Watershed management** consists of those coordinated human activities aimed at controlling, enhancing, or restoring watershed functions.
- **Community-based watershed management** - approach to water-resource protection that enables individuals, groups, and institutions with a stake in management outcomes (often called stakeholders) to participate in identifying & addressing local issues that affect or are affected by watershed functions.
- **Social Aspects:** watershed management and its contribution towards optimal utilization of natural resources thereby accruing greater and sustainable benefits to mankind.

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So, that way, we can see that these social aspects have become very very important in any of the watershed management plans. So, we have to see the needs of the people and then we have to take their opinion in what way we have to do the planning and what way we have to implement, so that the plans will be sustained, and then also we take the helps of the communities, like public participations, in various implementation stages either in terms of monetary terms or as labor terms or whatever way possible implementation and maintenance, so that the projects are very well sustained.

So, that way, the social aspect is very important in all the watershed management plans; either formulated by central government, state governments or the even the panchayat

level. So, that way, now the trend has changed. So, now, let us look into various social aspects of watershed management. So, as I mentioned earlier, the main objective of any watershed management plan is social upliftment and well-being of the inhabitants, but in a sustainable way, so that the flora and fauna or the ecology is not affected. So, that is the main objective as far as any watershed management plan is concerned. So, watershed management generally consists of those coordinated human activities aimed at controlling, enhancing or restoring watershed functions.

As we have already seen in some of the previous lectures, various functions - watershed functions - or various hydrological processes we are considering in the watershed development plans or watershed management issues. So, that way, we are trying to, say have a coordinated human activities in controlling or enhancing or restoring. Then, most of the time we are looking for community based watershed management approach to water resource protection, so that, say all the people within the watershed are getting the benefits, so like individuals groups and institutions with a stake in management outcomes often called stakeholders which we have already discussed; we had a long discussion about stakeholders participation in watershed management. So, all this stakeholders are trying to participate in planning stage or to identify the issues and then address the local issues that affect or are affected by the watershed functions.

So, that way, the development of watershed management plans; the implementation of the watershed management plans and then the maintenance of that particular implemented plans; so, that way, all the aspects of the watershed management plans include the social aspects or the either individual level, group level or the community level.

So, that way, the social aspects are concerned, watershed management and its contribution towards optimal utilization of a natural resource thereby accruing greater and sustainable benefits to mankind. So, as I mentioned sustainability is a main issue in most of the watershed management plans. So, that way, the sustainability we can achieve through consideration of the social aspects and we can achieve the social upliftment of all the communities who are residing within that watershed including the ecological issues.

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**WATERSHED MANAGEMENT**

### Watershed Management- Social Aspects

- **Watershed management** - process of implementing land use practices & water management practices to protect & improve quality of water & other natural resources within a watershed by managing the use of those land & water resources in a comprehensive manner.
- **Watershed management** -a way of looking at relationships between people, nature, land and water.
- **Watershed management** - aims at bringing about balance between natural resources on one hand & society on the other.

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The slide features a dark blue background with a landscape image at the top. The title 'WATERSHED MANAGEMENT' is in yellow and white. Below it, 'Watershed Management- Social Aspects' is in white. Three bullet points are listed in white text. In the bottom left, there is a circular logo with 'NPTEL' in the center. In the bottom right, there is a circular diagram with three overlapping segments labeled 'environment', 'economy', and 'society'.

So, that way, so, when we discuss about the watershed management plans, so as we discussed earlier, watershed management are the process of, say it is the process of implementing land use practices and watershed management practices to protect and improve the quality of water and other natural resources within a watershed by managing the use of those land and water resource in a comprehensive manner.

So, as we discussed in the previous lectures, this is not only water or land but we are considering all the aspects, all the watershed functions, what is there within that watershed. So, that way, when we look into watershed management, watershed management, we have to look into various relationships between the people nature lands and water. So, this is very important; we have to see all the relationships between the people, nature, lands and water.

So, that way, the aim of the watershed management is to bring about a balance between the natural resources on one hand and society on the other. So, the society plays a major role. It is not like earlier times some of the officials or the government dictating this dam should be consider this location or these kinds of activities, these kinds of soil conservation activities should be done at particular location, but now, we have as far as watershed management plans are concerned, we are looking for what are the society needs or what are the people needs. So, all the social aspects we are considering as far as the watershed management plans are concerned.

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Social aspect when we consider, so the sustainable development is the main issue. So, sustainable development of an area or a watershed, then we have to see the economical aspects or economical prosperity of the society; then the environmental issues or ecological issues, and then, of course, various political issues also may come within that watershed as far as such sustainable developments are concerned. So, that way, the social aspects are very important as far as the sustainable development of the particular area or particular watershed which we consider.

So, that way, to achieve the sustainability, the socially acceptable economically and technically viable projects, we have to see the multidisciplinary approach, so that social institution involvement of stakeholders with holistic approach, and then, we have to see that capacity building for the various communities takes place with good science and smart planning.

So, here the keywords are - it is a sustainable development as far as social aspects are concerned. Then we are going for holistic approach and then, of the, watershed management plan should be with supported with good science and smart planning. So, that way, we have to consider the various aspects as far as social issues and sustainable development of the watershed.



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**WATERSHED MANAGEMENT**

**Social Aspects of Watershed Development**

**Why Social Aspects are important in Ecosystem Management?**

- Principles of ecosystem management include statements about how humans and human values are integral ecosystem components, suggesting that:
  - ❑ "People cannot be separated from nature,"
  - ❑ "Humans are fundamental influences on ecological patterns and processes and are in turn affected by them," and
  - ❑ "Regardless of the role of scientific knowledge, human values play a dominant role in ecosystem management goals".

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The slide features a Venn diagram in the bottom right corner with three overlapping circles labeled 'ecology', 'economy', and 'society'.

So, now, when we look into social aspects of watershed development, the question come - why social aspects are important in ecosystem management? So, as we have seen the watershed management is concerned, it is the interaction between the people, nature and various resources within that area. So then, the question comes, say as far as social aspects are concerned, of course the question is related to the ecosystem management.

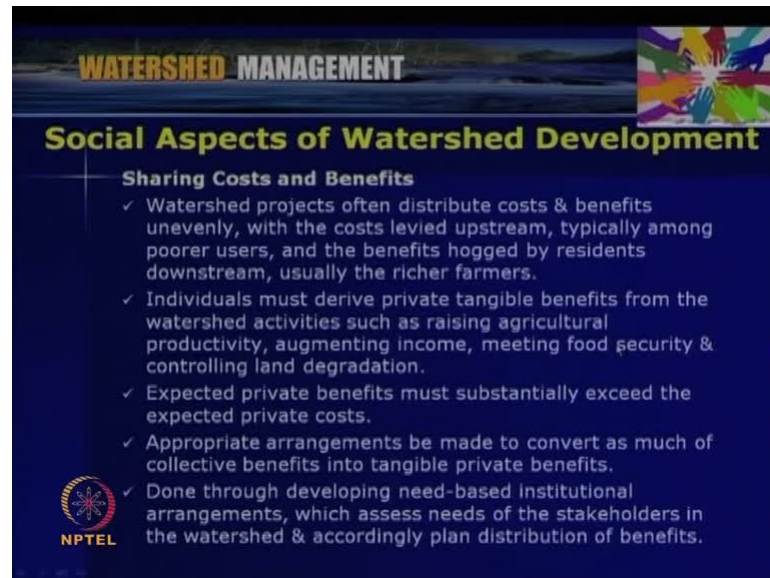
So, principles of ecosystem management include statements about how humans and human values are integral ecosystem components, suggesting that: people cannot be separated from the nature. So, people is, people of that particular area particular watershed are integral part of the nature.

So, humans are fundamental influences on ecological patterns and processes and are in turn affected by them. So, there is always interaction between the humans, the ecology and the nature. So, that way, we cannot separate one from another; so, that way, the social aspects are very important as far as watershed development is concerned.

So, regardless of the role of scientific knowledge, human values play a dominant role in ecosystem management goals. So as you can see in this figure, so if this represent, this circle represent the ecology and if this is the economy and then societies coming together, so that you can see that as far as ecology or the nature of the watershed and then economical upliftment or economy issues.

So, obviously, there is always interaction between the society or the human residing that particular area. So, that way, we cannot separate the social issues or social aspects as far as watershed management is concerned.

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**WATERSHED MANAGEMENT**

**Social Aspects of Watershed Development**

**Sharing Costs and Benefits**

- ✓ Watershed projects often distribute costs & benefits unevenly, with the costs levied upstream, typically among poorer users, and the benefits hogged by residents downstream, usually the richer farmers.
- ✓ Individuals must derive private tangible benefits from the watershed activities such as raising agricultural productivity, augmenting income, meeting food security & controlling land degradation.
- ✓ Expected private benefits must substantially exceed the expected private costs.
- ✓ Appropriate arrangements be made to convert as much of collective benefits into tangible private benefits.
- ✓ Done through developing need-based institutional arrangements, which assess needs of the stakeholders in the watershed & accordingly plan distribution of benefits.

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So, now, when we looking to the social aspects of watershed development, so we have to see when we are implementing certain projects or certain management plans as far as the particular watershed management is concerned. So, we have to see the economical aspects; so, how much costs are involved and then what will be the benefits.

So, that way, most of the time to understand how the system is or how the watershed is working or how the system is behaving, we have to go for a cost benefits analysis, and then, the most of the time the community or the people how to share the costs since they are the main beneficiaries as far as the plans which we are implementing within the concerned watershed even though there will be supports from the government or NGOs or other agencies.

So, within this perspective, the watershed projects often distribute costs and benefits unevenly, with the costs levied upstream, typically among poor usage, and the benefits hogged by residents in the residing a downstream, usually the rich farmers. So, this is always happening since within a watershed with especially in larger watersheds. So,

upstream areas a large number of watershed management plans are implemented and the costs are levied upon the poor people staying in that area.

But the benefits will be mainly reaped by the rich people who may be on the downstream side of the watershed. So, individuals must derive private tangible benefits from the watershed activities such as raising agricultural productivity, augmenting income, meeting food security and controlling the land degradation.

So, that way, we have to consider a holistic approach. It is not only the people staying believing on the downstream end of the watershed, but upstream people also should get all the benefits from the various watershed activities like may increase in production agriculture, then availability of water meeting the food security, then employment generation and then ecological balance, etcetera.

So then, in that way, as far as social aspects are concerned, we always expect that private benefits must substantially exceed the expected private costs. So, if the people are spending money in as far as the various watershed schemes are concerned, the benefits should be substantially exceed. Then appropriate arrangements be made to convert as much of collective benefits into tangible private benefits.

So, say the collective benefits, say as far as a total system is concerned, that will be significant but that also we have to see that private benefits are also is tangible; otherwise, people will not get motivated to do various watershed management plans.

So then, we have to deal in such a way that developing need based institutional arrangements. So, when the area is concerned, it is not only simply implementing some projects or watershed management plans. We have to develop appropriate institutions like water user groups or say forest user groups or the income sharing groups for the particular watershed.

So, if you check into many of the successful watershed management plans of a watershed successful projects, we can see that wherever say such groups like water user groups or forest management group or say income distribution groups and they working together there only this most of the projects were successful. So, that way, the, it is not simply developing some schemes and implementing it, but we have to, we should have an

institutional arrangements within that particular area, so that the various issues related to like income generation, then water usage or forest management or the various gracing for say the cattle, all those issues can be sorted out. So, institutional development is also very important as far as the watershed development plans are concerned.

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**WATERSHED MANAGEMENT**

### Community Participation

- Proponents of **community-based watershed management** maintain that involving local stakeholders results in more locally relevant solutions that take into account each community's unique social, economic, and environmental conditions and values.
- **Stakeholder participation** is also thought to create a sense of local ownership of identified problems and solutions, thus ensuring long-term support for resulting management plans.

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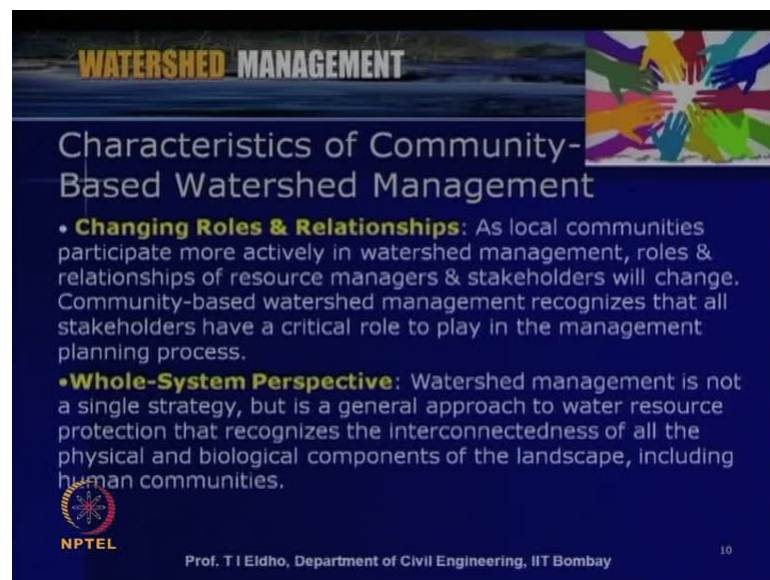
So, that way, we can see that when we have to develop such schemes like water user groups or watershed development groups, so we have to get all the people together and then we have to take their opinion and then implement the projects and then maintain it.

So, that way, the community participation is very important in most of the watershed management plans. So, the proponents of community based watershed management maintain that involving local stakeholders results in more locally relevant solutions that take into account each communities a unique social economic and environmental conditions and values. So, that way, very important, so as far as particular watershed is concerned, whatever projects we are implementing should be community based projects or community participation is very essential.

So, according to the needs of the community, we have to frame the projects and then implement it. So, that way, as we discussed earlier, stake holders participation is thought to create a sense of local ownership of identified problems and then solutions, then ensuring long time support for resulting management plans. So, we can see that, for

example, if you are going to develop a check dam for a particular watershed, so once that check dam is constructed, so it needs lot of repair works and maintenance. So, this is only possible if the stakeholders are participating in its planning and then implementation and then maintenance, so that the system is sustainable. So, that way, as you can see here in this photograph, say, the, those who are the implementing agencies or the people who are organizing this, they have to take the opinion of the people or community participation is very essentials in this in any of the watershed management plans.

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**WATERSHED MANAGEMENT**

### Characteristics of Community-Based Watershed Management

- **Changing Roles & Relationships:** As local communities participate more actively in watershed management, roles & relationships of resource managers & stakeholders will change. Community-based watershed management recognizes that all stakeholders have a critical role to play in the management planning process.
- **Whole-System Perspective:** Watershed management is not a single strategy, but is a general approach to water resource protection that recognizes the interconnectedness of all the physical and biological components of the landscape, including human communities.

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So, when we discuss about the community based watershed management, let us look into what are the important characteristics as far as the community based watershed management plans are concerned. So, we can see that there are changing roads and relationships. So, as we have seen in the first slide, from the traditional approach, now the current approach is we have to see the various needs of the people, various social issues, the community aspects, all those things we have to consider. So, that way, the important characteristics of community based watershed management is there are changing roles and then the relationships are changing.

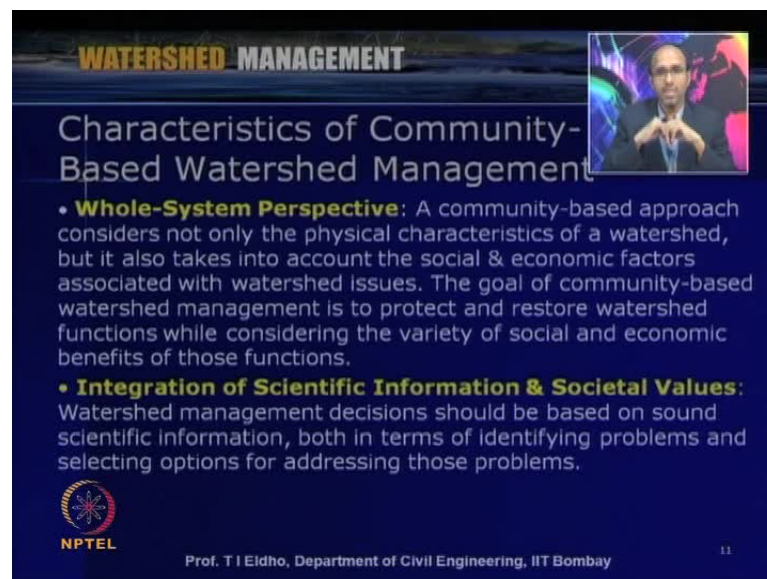
So, that way, as written here as local communities participates more actively in watershed management roles and relationships of resource managers. So, those who give money for this kinds of schemes like resource managers and stakeholders will change

and community based watershed management recognizes that all stakeholders have a critical role to play in the management planning process.

So, from the planning itself to implementation and maintenance, the stakeholders have a critical role. It is not only the donors who give the money or not only the government agencies but the local people should have a good say in the developmental plans and then implementation, so that the whole system perspective changes.

So, the watershed management is not now a single strategy, but as we have discussed, it is a general approach to waters resource protection that recognizes the inter connectedness of all the physical and biological components of the landscape including the human communities. So, that way, we have to consider the various issues as far as the watershed management plans are concerned.

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**WATERSHED MANAGEMENT**

### Characteristics of Community-Based Watershed Management

- **Whole-System Perspective:** A community-based approach considers not only the physical characteristics of a watershed, but it also takes into account the social & economic factors associated with watershed issues. The goal of community-based watershed management is to protect and restore watershed functions while considering the variety of social and economic benefits of those functions.
- **Integration of Scientific Information & Societal Values:** Watershed management decisions should be based on sound scientific information, both in terms of identifying problems and selecting options for addressing those problems.

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And further, so, as I mentioned the whole system perspectives, the perspective changes, so it is a holistic system we have to consider; I mean as a whole system. So, the community based approach considers not only the physical characteristics of a watershed but it also takes into accounts, social and economic factors associated with watershed issues.

The goal of community based watershed management is to protect and restore watershed functions while considering the variety of social and economic benefits of those

functions. So, that way, we have to see that various watershed functions are considered in an appropriate way and then the system is considered in a holistic way. So, that is another important characteristic as far as community based watershed management is concerned.

Then also we have to integrate the scientific information and societal values. So, it is not only the technological aspects as far as watershed management is concerned, we have to see the societal needs also as far as the watershed management plans are concerned. So, that way, watershed management decisions should be based on sound scientific information both in terms of identifying problems and selecting options for addressing those problems.

But by considering the societal values, so that is very important. So, whatever the traditions are there for the particular local communities, we have to see that their traditions are kept or the various values are kept; the societal needs are kept within the plans or societal values are kept. So, these are all very important now within the change perspective of the watershed management.

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**WATERSHED MANAGEMENT**

### Characteristics of Community-Based Watershed Management

- **Adaptive Management Style:** Addressing environmental, social, and economic issues at the watershed scale is complex, and often there is a high level of uncertainty regarding the outcomes of management decisions.



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So, now, as we discussed already the management style change, so that means the, we have to adapt the new style by considering the community involvement, community participation, social upliftment, societal needs, etcetera.

So, the adaptive management styles, in that, we have to address the environmental, social and economic issues at the watershed scale. So, these issues are very complex and often high level of uncertainty regarding the outcomes of management decisions will be there. So that way we have to study various plans and then only we have to go for implementations, and then, we have to see may be the benefit cost analysis and then also each problem we can have various scenarios or various ways we can approach those problems. So, we have to see that in a holistic way by considering the community perspectives or the societal needs how we can do that. So, that way, we have to deal with the watershed management plans.

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**WATERSHED MANAGEMENT**

### Challenges Associated With Community-Based Watershed Management

- **Watersheds** may cover thousands of acres of public & privately owned land. Developing a basic understanding of how human activities affect watershed functions is a major undertaking.
- **Some key stakeholders** may lack the time, motivation, skills, or resources to participate effectively throughout the management planning process.
- **Resource management** professionals may be reluctant to give up their role as experts and to share authority with lay persons regarding resource management issues.

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So, now, let us look into what are the important challenges associated with community based watershed management. So, we can see that now compared to earlier times, now various, we have number of challenges as far as the community based watershed management is concerned. So, now watershed may cover thousands of acres of public and privately owned land. Developing a basic understanding of how human activities affect watershed function is a major questions or a major undertaking. So, we can see that village level or a watershed level or a particular river basin level, we can see that where the public land owned by government; then private lands all those things will be there; so, the system is so complex.



So, whatever the plans which we want to implement, even though in public lands it may be somewhat easier but private land the stakeholders should agree for that. So, otherwise the scheme which we are developing cannot work.

So, that way, it is a big challenge to consider all the stakeholders including the government and all the agencies come together. So, that is a major challenge as far as community based watershed management is concerned, and then, most of the times, some key stakeholders may lack the interest, time motivation skills or resources to participate effectively throughout the management planning process.

So, as I mentioned, some of the areas will be belong to particular private owners. So, if you want to implement certain schemes like water harvesting or any of the schemes in their land, then they should get motivated and then they should be ready to implement it. So, that way, it is a major challenge, and then, another major challenge is resource management professionals may be reluctant to give up their role as experts.

So, you can see that now with the changing scenarios, as we discussed in the first slide, so, now the resource managers roles are also changing. So, they may be thinking always they are the experts, but the reality is that we have to consider community views. So, that way, it is a challenge to share authority with lay persons regarding resource management issues.

So, you can see that when we are taking the opinion of different people who especially local people, so they may have different opinions since their needs will be different, their perspective will be different. So, the resource managers or the experts may think always on their own terms or their own way. So, that may not be always appropriate. So, that is another major as far as the community based watershed management plans are concerned.

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**WATERSHED MANAGEMENT**

## Challenges of Community-Based Watershed Management

- Conflicts between stakeholders over management goals and the means to accomplishing those goals are inevitable, and resource management professionals are often ill-prepared to facilitate constructive dialogue to resolve these conflicts.
- Community-based approaches require time and resources to generate interest and to build relationships between stakeholders.
- Funding agencies and stakeholders may grow impatient with the lack of observable outcomes.

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And then also there will be conflicts between stakeholders or management goals and they are means to accomplishing these goals are inevitable, and resource management professionals are often ill prepared to facilitate constructive dialogue to resolve these conflicts.

So, when we discuss about the community based watershed management, there will be always conflicts will be taking place between the stakeholders or between the community with whom the resource managers or the implementers the agencies how to, say collaborate or come together.

So, that is another challenge, so, which we have to deal the various conflicts between the stakeholders, and as far as the resource managers are concerned, they have to achieve certain goals, but the stake holders or the community is concerned, their needs will be different. So, lot of conflicts will be there. So, to sort out this conflicts, that is another major challenge.

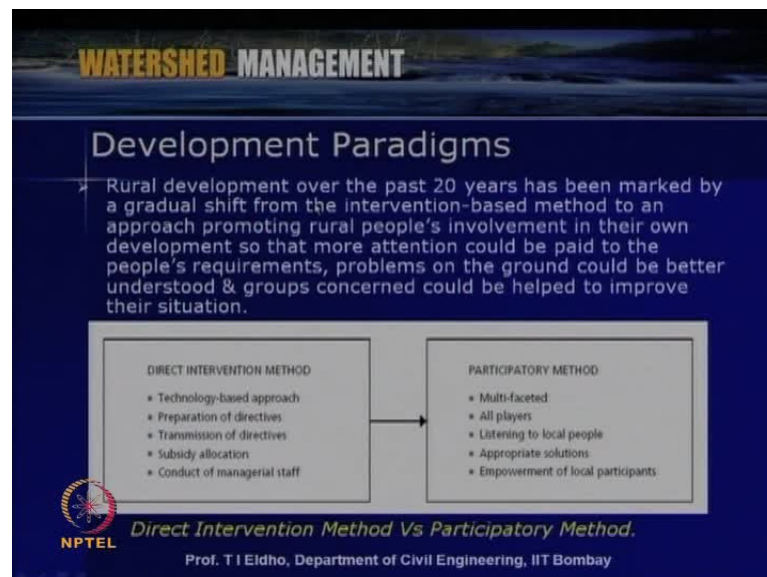
And then community based approaches require time and resources to generate interest and to build relationships between stakeholders. So, when we are going to implement certain projects or certain schemes in a particular watershed, there should be good relationship between the stakeholders or between the people and those who are going to implement or the resource managers or resource people.

So, that way, time is required and even the local language should be known, local culture should be known those who are going to implement the various schemes. So, that way, these things are also major challenges as far as community based watershed management is concerned.

And then funding agencies and stakeholders may grow impatient with lack of observable outcomes. So, this is another issue, so those who are funding, say like if you consider World bank or the Asian development bank or other agencies who are funding various projects, so they want to see the outcome on a time based manner, but when we have to take the opinions of the communities or the local people or stake holders, and then, we have to take their views in planning and management and implementation.

So then, of course, there will be it will be taking more time and then the funding agencies become impatient since there are no observable outcomes. So, these are all some of the important issues which we have to consider when we deal with community based watershed management.

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So, now, as I mentioned last few decades, there is a change in paradigms. So, say the total system is changing as far as watershed management is concerned. Earlier it was traditional system, its top to bottom or the government doing certain projects and try to implement, but now, the system is totally changing. Most of the time now we are looking

for community based system with community participation and the stake holders participation.

So, that way, if we look into rural development or the watershed development or the past 20 years, we can see that there are mark able changes or shift from the intervention based method to an approach promoting rural peoples involvement in their own development, so that more attention should be paid to the people's requirements. Problems on the ground could be better understood and groups concerned could be help to improve their situation. So, that way, the social aspects, the societal needs or the community participations are considered. So, there is a paradigm change say within the last 2-3 decades.

So, like, if earlier it was direct intervention method, now it is participatory method. So, like technology based approach was there earlier, but now, the most of the watershed management plans have multi-faceted approach. Then earlier, there was we used to have preparation of directive, and now, it is not the directives from the higher officials or officials but all players are there as far as the schemes are concerned. Then transmission of directives - it was simply by order by sending a paper. This is what is going to be done like that, but now, the system is changing; we have listened to local people, we have to see their opinion.

And then subsidy allocation that was generally used by the district level, state level or central level governments, but now, say we have to look into appropriate solutions, and then, earlier direct intervention method, we used to conduct of managerial staff; that means particular staff will be there to conduct the various projects as far as watershed management is concerned, but now, the, in the participatory method, we are looking for empowerment of the local participants.

So, local participants have a good say in the development plans and then the implementation and the maintenance. So, that way, the public participation we have to ensure in all the watershed management plans, so that we can achieve sustainability, equity and participation.


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**WATERSHED MANAGEMENT**

## Public Participation

**Ensuring Public participation:**  
Sustainability, Equity and Participation are the **three basic elements** of participatory watershed management.

- **Sustainability** involves conservation and enhancement of the primary productivity of the ecosystem, the main components of which are land, water and biomass.
- **Equity** has to be seen in terms of creating an equitable access to livelihood resources for the watershed community.
- **Participatory watershed management** attempts at ensuring sustainability of the ecological, economic & social exchanges taking place in the watershed territory.
- Includes natural resource exchange, which is the conventional watershed management, and participatory watershed management additionally considers the economic, political and cultural exchanges.

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So, these are the three basic elements in the participatory watershed management, so, sustainability, equity and participation. So, we have to see that this is the plans which we are implementing are ecologically or environmentally sustainable. Then equity should be there, whatever say, it is not only the downstream rich farmers are getting the benefits but there should be equitable distribution of the income generated within the watershed.

Then all the people should participate in various aspects of the projects or the plans. So, the sustainability involves a conservation and enhancement of the primary productivity of the ecosystem, the main components which are land, water and biomass.

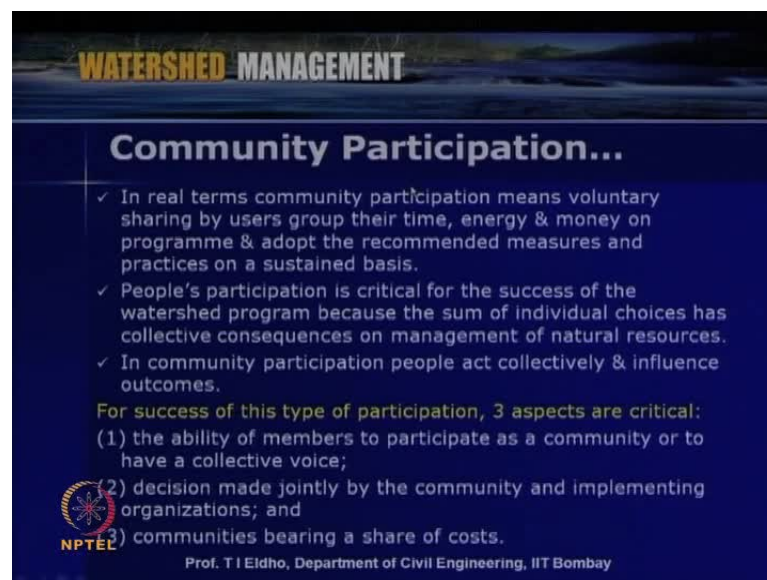
So, we have to see the sustainability issues of land, water and biomass, and as far as equity is concerned, we have to see that equity has to be seen in terms of creating an equitable access to livelihood resources for the watershed community. So, people, all the peoples should get job, income generation, then sufficiency in water availability, and then also, say then the needs of their capital or needs of the agricultural needs all these should be met.

Then as far as participatory watershed management is concerned, attempts are there to ensure sustainability of the ecological economic and social change exchanges taking place in the watershed territory. So, this is what we are looking for.

So, that way, the participatory watershed management includes natural resource exchange, which is the conventional watershed management, and participatory watershed management additionally considers the various economical aspects political aspects and the cultural exchanges.

So, that way, we have to see the holistic system within the watershed including the economic upliftment, then the political issues and then the various the traditions and cultural activities of the people. So, that way, now we have to implement the participatory watershed management projects.

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**WATERSHED MANAGEMENT**

### Community Participation...

- ✓ In real terms community participation means voluntary sharing by users group their time, energy & money on programme & adopt the recommended measures and practices on a sustained basis.
- ✓ People's participation is critical for the success of the watershed program because the sum of individual choices has collective consequences on management of natural resources.
- ✓ In community participation people act collectively & influence outcomes.

For success of this type of participation, 3 aspects are critical:

- (1) the ability of members to participate as a community or to have a collective voice;
- (2) decision made jointly by the community and implementing organizations; and
- (3) communities bearing a share of costs.

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Finally, as we discussed community participation is very essential, so, we have to see how much the community can get involved within the from the beginning itself, and then, throughout the implementation and the maintenance of the system considered. So, in real terms, community participation means it can be voluntarily sharing by users group, their time, energy and money on programs and adopt the recommended measures and practices on a sustain basis.

So, as far as community participation is concerned, it can be in terms of their efforts or their time and energy and they or they can also contribute in terms of money to start the projects, and then to implement the projects, and that way, the people participation is

critical for the success of the watershed program, because the sum of individual choices has collective consequences on management of natural resources.

So, that way, we have to see the community participation. So, in community participation, people act collectively and influence the outcomes. So, the people are coming together either at the at the planning stage itself and then in terms of either voluntary labor or their time, energy and money is concerned.

So, for success of this type of participations, generally three aspects are critical - number 1 is the ability of the members to participate as a community or to have a collective voice; then second one is decision made jointly by the community and implementing organizations, and then communities bearing a share of costs.

So, that way, when we are looking to various schemes, we can see that whether the donors or the government may be 70 percent the resources are coming from the government or other agencies; then 30 percent can be taken by the local people who are getting the benefits or 50 50. So, like that, the according to the economic capacity of the people or according to the availability of resources, we can have plans for the particular watershed.

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**WATERSHED MANAGEMENT**

## Public Participation

**Conditions for facilitating people's participation:**

- (1) Making people aware about potential benefits of collective action in conserving & managing natural resources
- (2) Demand-driven activities in the watershed program;
- (3) Empowering people in planning, implementing and managing watershed programs;
- (4) Sufficient private economic benefits to create incentives for participation.

**Collective action can be defined as the pursuit of a goal or set of goals by more than one actor.**

**Empowering the community**  
When people are empowered to take decisions & execute the activities, they own the program. They run the watershed activities according to local, social & cultural systems.

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So, finally, we can see that the public participation is very importance. Some of the conditions for facilitating people participation include making people aware about potentials, benefits of collective action in conserving and managing natural resources.

So, we can see that as far as watershed is concerned, it is a large area. So, instead of one person doing particular thing, but if the people can collectively come together, so that like if you are constructing check dam or if you are going for water harvesting measures, if the things are done collectively, then there will be say the output will be much much better. So, the potential benefits will be much better, and then, demand driven activities in the watershed programs. So, what are the important needs of the people, so, accordingly, we can have the plans made. So, what is urgent need? First one - what is needed; then second one, like that, we can put the plans.

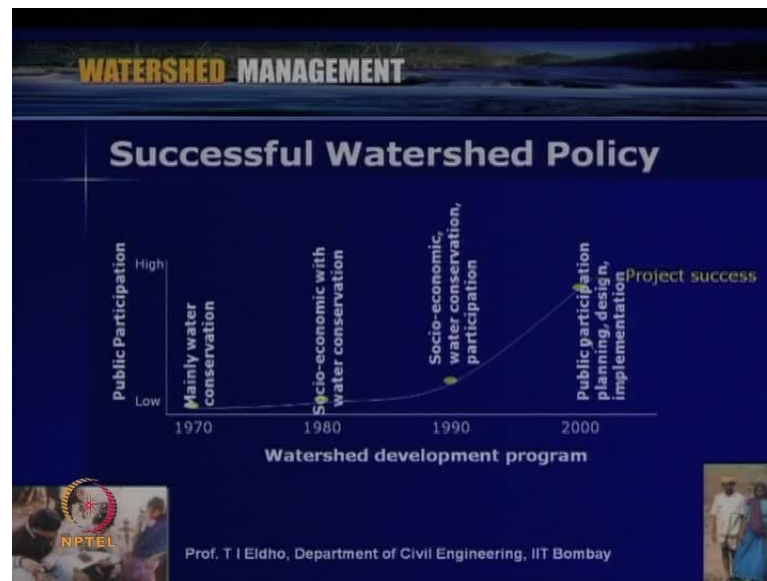
Then, empowering people in planning, implementing and managing the watershed programs Then, sufficient private economic benefits to create incentives for participation. So, the people they will see that what are the benefits coming to them, so, individually also or individual family wise also, so, that way only then the people will be motivated to actively participate. So, that way, we have to see.

So, that way, collective action can be defined as the pursuit of a word or set of words by more than one hector. So, it is not only say individual system but a collective system or the collective, the community participation and the donors and the various government agencies or all of them should come together. So, finally, but what is happening should be empowering the community. So, when people are empowered to take decisions and execute the activities, they own the program.

So, they have the feeling of this project is my project or our project. So, that way, when they have the ownership feeling, so thus they will do the best thing for that project, and then, they will try to maintain it also properly. So, they run the watershed activities according to the local social and cultural system. So, that way, the system will be maintained for a long time and, the system, the total benefits will be much better compare to the earlier tradition based system.



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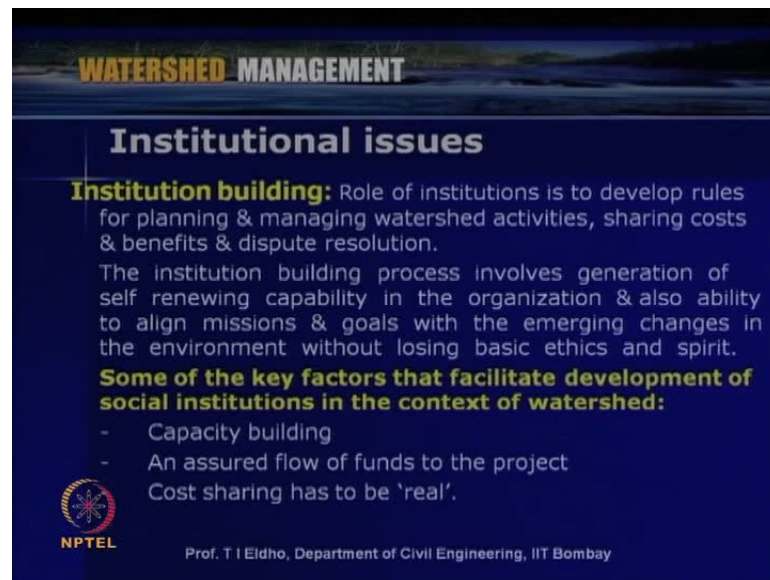
So, that way, when we look into various watershed management development plans, for example, India is concerned. So, as far as public participation or community participation, we can see that 40 years back in 1970s. So, as I mentioned earlier, it was traditional systems where the government agencies implement certain projects, the officials comes, and then they make the plans and then they implement and then they leave it for the community.

So, that way, the mainly the water conservation or soil conservation, that, that were the major objectives in 1970s, so that where you can see that many of these projects if you assess, we can see that they were not so successful. Then in 1980s socio economic aspects also came into picture. So, that way, with water conservation, the social aspects economical aspects also were considered. So, that way, we can see that some improvement in project success. Then in 1990s, socio economic, water conservation and then also people participation also started. So, many of the successful projects we can see that whatever implemented in 1990s with people participation or community involvement, they were very successful, and now, say in 2000 or the last few years, we can see that even government agencies are themselves stipulating that public participation is very essential and community involvement should be there.

So, public participation planning, in planning, design and implementation, and the maintenance. So, that way, we can see that when we analyze many of these projects, so

this projects already success, so, since the particular communities were very much involved in the schemes.

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**WATERSHED MANAGEMENT**


### Institutional issues

**Institution building:** Role of institutions is to develop rules for planning & managing watershed activities, sharing costs & benefits & dispute resolution.

The institution building process involves generation of self renewing capability in the organization & also ability to align missions & goals with the emerging changes in the environment without losing basic ethics and spirit.

**Some of the key factors that facilitate development of social institutions in the context of watershed:**

- Capacity building
- An assured flow of funds to the project
- Cost sharing has to be 'real'.

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So, now as I mentioned when the particular watershed management plans are undertaken and then implementation starts, so, we have to develop suitable institutional mechanism for the development plans, implementation and maintenance.

So, institutional development is also very important. Nowadays most of the NGOs or government agencies are also looking into these aspects, so, institutional development or institutional building. So, the role of institution is to develop rules for planning and managing watershed activities, sharing costs and benefits and then also many times there will be disputes between the stakeholders, so dispute resolution also.

So, this is the way to deal with all this issues, we have to develop a suitable institution within the watershed like it can be watershed users group or water users group or forest management group various institutions we have to build.

So, that way, now a days NGOs and various government agencies are taking this kind of institutional issues also. So, the institution building process involves generation of self-renewing capability in the organization and also ability to align missions and goals with the emerging changes in the environment without losing basics ethics and spirit.

So, that way, we have to develop the institutional mechanism within the watershed, and then, most of the time we have to see that there is democratically elected bodies are there with for the management of the various resources within the watershed, and then there should be also elections or that kind of process should be also take place. So, that way, we have to develop the institution for that particular watershed.

So, some of the key factors that facilitate development of social institutions in the context of watershed - so, first one is capacity building, then second one is an assured flow of funds to the project, then cost sharing has to be real. So, if a suitable institutional mechanism has been developed for the particular area, so, that institutional mechanism can look into capacity building.

So, how to generate funds or how to implement particular projects; then also the particular institutional mechanism can look into generate funds and then the how we can share the costs and then also how the benefits can be shared. So, all those issues we can look into once suitable institutional mechanisms have been developed for that particular watershed.

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**WATERSHED MANAGEMENT**

### Institutional issues

- contribution of voluntary labor does not necessarily create a feeling of ownership of the assets created for land & water development.
- Strong dedicated and committed leadership
- A shared perception of benefits by all group members
- **Factors that impede the process of institution building in the watershed programs:**
  - • Unreasonable quotas and targets
  - • Lack of self-reliance
  - • Lack of transparency
  - • Failure to mobilize local resources

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So, the institutional issues like contribution of voluntary labor does not necessarily create a feeling of ownership of the assets created for land and water development. So, if a say

suitable institutional mechanisms are not developed, so, simply ask the people to give their labor or give their, the, money that may not work.

So, strongly dedicated and committed leaderships are required for the particular watershed to implement the suitable projects. Then a shared perception of benefits by all group members should be there. So, as I mentioned democratically elected members who are controlling say either annual basis or 3 years time or 5 year time, so, that way, it will be possible.

So, some of the important factors that impede the process of institution building in the watershed programs include unreasonable quotas and targets. So, we have to see that only reasonably; we have to put our targets. Then lack of self-reliance, so most of the time the concerned agencies have to give training in development as such institutions and then maintaining, then lack of transparency. So, as you can see that most of the time corruption is a major issues since the money is not utilized properly, and then, all those issues have to be seen carefully.

So, that way, suitable institutional mechanisms is required, and then, failure to mobilize local resources. So, if locally based groups are not formed, then local resources also cannot be mobilized. So, that way, institutional development is very much essential, and that way, we have to see the institutional issues.

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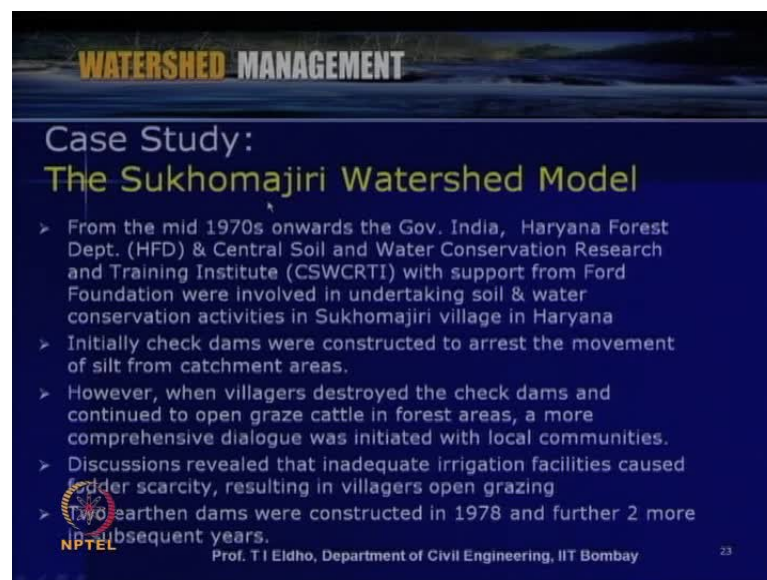


So, that way, when we look into the community based or social aspects of watershed management, so, from the planning stage, we starts, and then, till the implementation stage, it should go. So, the natural resource or the particular resources within the watershed, so including the natural resource mapping either using the modern techniques or through surveys, we have to get the help of the local people.

Then the social mapping also we have to see the social pattern within the watershed, and this also we need the community participation, and then, all these things we can do through village volunteers or if you form the institutional mechanism for the watershed, we can use their help.

And then, we can call the meeting either the users group or the people within the watershed. So, participatory appraisal can be done, and then, we can prioritize various schemes various options within the concerned of the people, and then, the implementation stage itself we can see that the people, the local people can give their helps in terms of labor or money and then the projects can be implemented, and then, further it can be maintained. So, that way, we have to develop the system.

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**WATERSHED MANAGEMENT**

**Case Study:**  
**The Sukhomajiri Watershed Model**

- From the mid 1970s onwards the Gov. India, Haryana Forest Dept. (HFD) & Central Soil and Water Conservation Research and Training Institute (CSWCRTI) with support from Ford Foundation were involved in undertaking soil & water conservation activities in Sukhomajiri village in Haryana
- Initially check dams were constructed to arrest the movement of silt from catchment areas.
- However, when villagers destroyed the check dams and continued to open graze cattle in forest areas, a more comprehensive dialogue was initiated with local communities.
- Discussions revealed that inadequate irrigation facilities caused fodder scarcity, resulting in villagers open grazing
- Two earthen dams were constructed in 1978 and further 2 more in subsequent years.

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Let us go through a case study. So, case study is Sukhomajiri watershed model which was developed in 1970s and 80s in Haryana. So, from the mid-1970s onwards government of India, Haryana forest department and central soil and water conservation

research and training institute the support from donors like Ford Foundation were involved in undertaking soil and water conservation activities in Sukhomajiri village in Haryana.

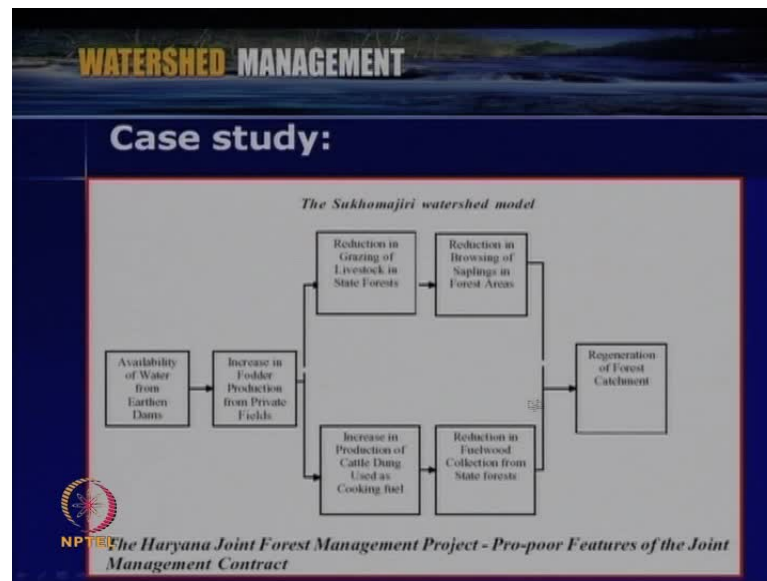
So, initially, as you can see that the traditional systems were there; so, check dams were constructed to arrest the movement of silt from catchment areas, and then, the water availabilities increased. So, however, you can see that due to the lack of community participation and the people involvement.

So, when villages destroyed the check dams and then continue to open graze cattle in forest areas, so, that way, the project was not successful what was done in 1970s. So then, the implementers of the various agencies came together, and then, they initiate a dialogue with the local communities.

So, that way, a comprehensive dialogue was initiated with the people. So, discussions reveal that inadequate irrigation facilities caused fodder scarcity in that region; then resulting in villagers going choosing for open grazing. So, that were the major issues as far as the watershed is concerned. So, that way, simply construction of an out check dams, we are not working for the area.

So, that way, then the various agencies sat together with the local people and then further were constructed two more earthen check dams and further in 1978 and further two more subsequent years, but then, their total approach changed, it is, it was not simply for water conservation or soil conservation.

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But as we can see that the various usage groups were formed for the particular watershed. So, with respect to availability of water from the earthen dams, so the according to the needs of the people, the water distributed for either family basis within the watershed, and then, so that the increase in fodder a production from private lands and public lands took place, and then, various committees were formed for including the forest management grazing and water sharing and the benefit sharing.

So, that way, reduction in grazing of live stocks in state forest happened. Then increase in production of cattle dang used as cooking fuel, so, it is not only water issues but energy needs also were taken care, and then, reduction in browsing of saplings in forest area that were also. So, after all these schemes were implemented with the community participation, and reduction and fuel would collection due to the usage of cattle dung for cooking fuel.

And finally, what is, what was observed, say in 1980s regeneration of forest catchment took place, and say the total resources were shared by the people and then various usage group were formed and benefits also were shared by the people.

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**WATERSHED MANAGEMENT**

**Case study:**

**Six features of the institutional contracts that characterized formation of community organizations are notable:**

- Water user associations were constituted
- Landless households were given a share of water from dams and attempts were made to institute a system of tradable water shares so that landless households could sell their share of water to other households.
- Profits from the sale of water from dams (fiber & fodder grasses) could be used for community development activities. Such activities could take the form of construction of village roads, repair of school buildings or construction of rest areas for laborers.

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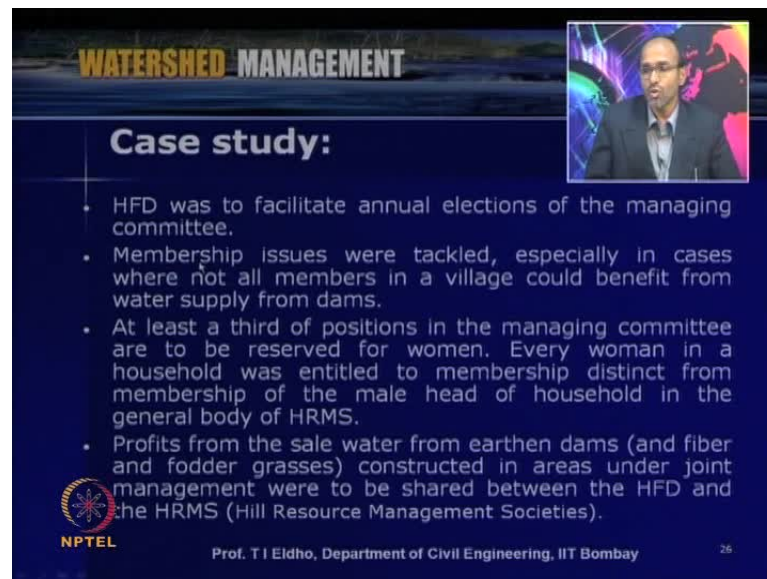
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So, some of the important features of these case studies the institutional contracts that characterized formations of community organizations were formed. So, water user associations as I mentioned were constituted for the watershed. Then landless households were given a share of water from dams and attempts were made to institute a system of tradable water shares to, so, that landless households could sell their shares of water to other households.

So, that way, they can also earn some money. So then, profits from the sale of water from dams and then production of fiber and fodder grasses could be used for community development activities. So, it is by all these activities, the funds generated were used for construction of village roads, repair of school buildings or construction of rest areas for laborers. So, all the social issues were dealt appropriately with the community participation. So, that way, the studies conducted in 1990s showed that finally the efforts were successful; it has become a successful watershed management plan.



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The slide features a dark blue background with the title 'WATERSHED MANAGEMENT' in yellow and white at the top. A small inset video shows a man in a suit speaking. The main content is a 'Case study:' section with a bulleted list of points. At the bottom left is the NPTEL logo, and at the bottom center is the text 'Prof. T I Eldho, Department of Civil Engineering, IIT Bombay'. A small number '26' is visible in the bottom right corner of the slide.

**WATERSHED MANAGEMENT**

**Case study:**

- HFD was to facilitate annual elections of the managing committee.
- Membership issues were tackled, especially in cases where not all members in a village could benefit from water supply from dams.
- At least a third of positions in the managing committee are to be reserved for women. Every woman in a household was entitled to membership distinct from membership of the male head of household in the general body of HRMS.
- Profits from the sale water from earthen dams (and fiber and fodder grasses) constructed in areas under joint management were to be shared between the HFD and the HRMS (Hill Resource Management Societies).

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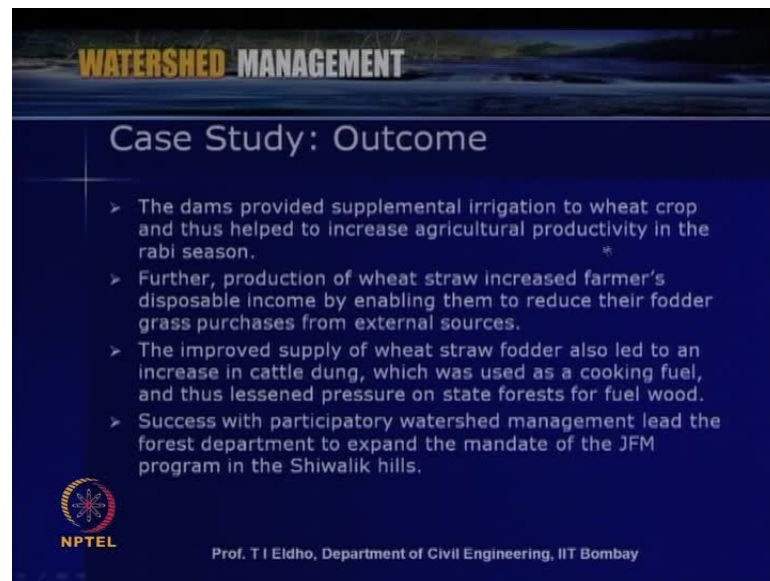
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So, the case study shows that the forest department has to facilitate annual election of the managing committee, so, water user groups. Then membership issues were tackled especially in cases where not all members in a village could benefit from water supply from dams.

At least a third of positions in the managing committee are to be reserved for women. Every woman in the household was entitled to membership distinct from a membership of the male head of house hold in the general body of the hill resources management societies.

Then profits from the sale of water from earthen dams constructed in areas under joint management for us were to be shared between the Haryana forest department and the hill resource management societies. So, that way, the economical capability of the people and the community have been improved, and then, the project was become a total success.


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**WATERSHED MANAGEMENT**

### Case Study: Outcome

- The dams provided supplemental irrigation to wheat crop and thus helped to increase agricultural productivity in the rabi season.
- Further, production of wheat straw increased farmer's disposable income by enabling them to reduce their fodder grass purchases from external sources.
- The improved supply of wheat straw fodder also led to an increase in cattle dung, which was used as a cooking fuel, and thus lessened pressure on state forests for fuel wood.
- Success with participatory watershed management lead the forest department to expand the mandate of the JFM program in the Shiwalik hills.

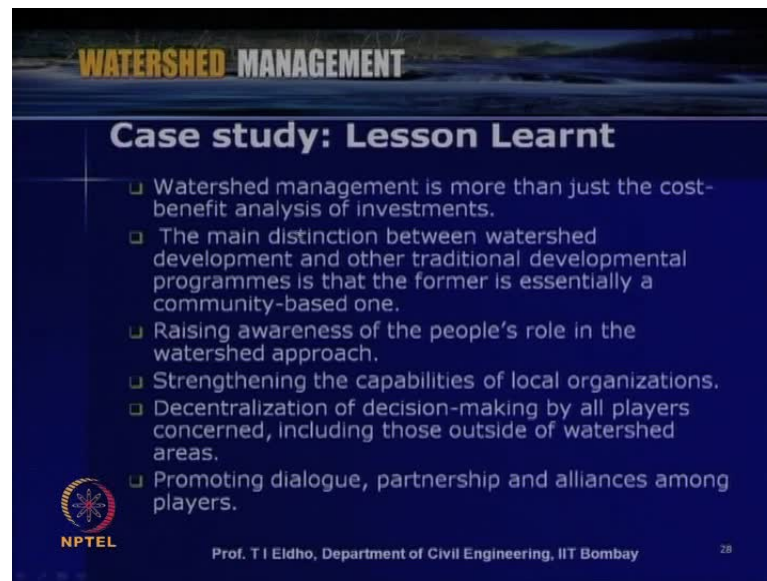
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So, some of the important outcome from the study - the dams provided supplement irrigation to wheat crops and thus helped to increase agricultural productivity in the Rabi season. Then, further production of wheat straw increased farmer's disposable income by enabling them to reduce their fodder grass purchase, purchases from external sources. The improved supply of wheat straw fodder also led to an increase in cattle dung, which was used as a cooking fuel, and thus lessened pressure on the state forest for fuel wood.

And then, success with the participatory watershed management led the forest department to expand the mandate of the joint management forest program as such in Shiwalik hills another case study area.

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**WATERSHED MANAGEMENT**

### Case study: Lesson Learnt

- ❑ Watershed management is more than just the cost-benefit analysis of investments.
- ❑ The main distinction between watershed development and other traditional developmental programmes is that the former is essentially a community-based one.
- ❑ Raising awareness of the people's role in the watershed approach.
- ❑ Strengthening the capabilities of local organizations.
- ❑ Decentralization of decision-making by all players concerned, including those outside of watershed areas.
- ❑ Promoting dialogue, partnership and alliances among players.

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So, some of the important lessons learned from these case studies include watershed management is more than just the cost benefit analysis of investment. The main distinction between watershed development and the other traditional developmental programs is that the former is essentially a community-based one, and raising awareness of the people's role in the watershed approach. Then, strengthening the capabilities of local organizations.

Decentralization of decision-making by all players concerned, including those outside of watershed areas, and promoting dialogue, partnership and alliances among the players. So, the total involvement of the community. So, that way, this case study we can analyze the community base development or watershed management plans are very important for the success of the plans.

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**WATERSHED MANAGEMENT**

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[http://en.wikipedia.org/wiki/Watershed\\_management](http://en.wikipedia.org/wiki/Watershed_management)

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**WATERSHED MANAGEMENT**

### Tutorials - Question!?.?

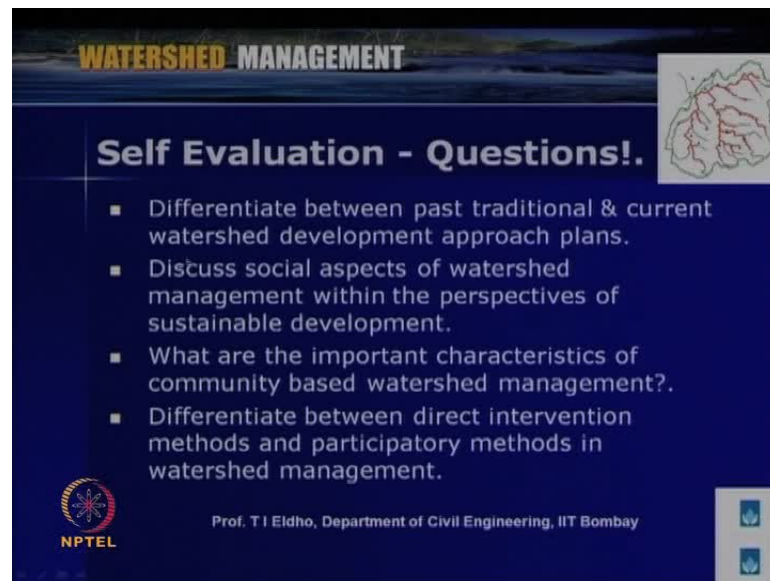
- How community participation can be used to make appropriate watershed management plans & implementations.?.
- Discuss the possible levels of community participations in watershed management plans.
- How the Watershed User Groups can help in the overall sustainable development & management of Watersheds?.

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So, some of the important references used in today's lecture have given here, and before closing, some of the tutorial questions - how community participation can be used to make appropriate watershed management plans and implementations? Discuss the possible levels of community participations in watershed management plans. How the watershed user groups can be can help in overall sustainable development and management of watersheds?

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**WATERSHED MANAGEMENT**

### Self Evaluation - Questions!

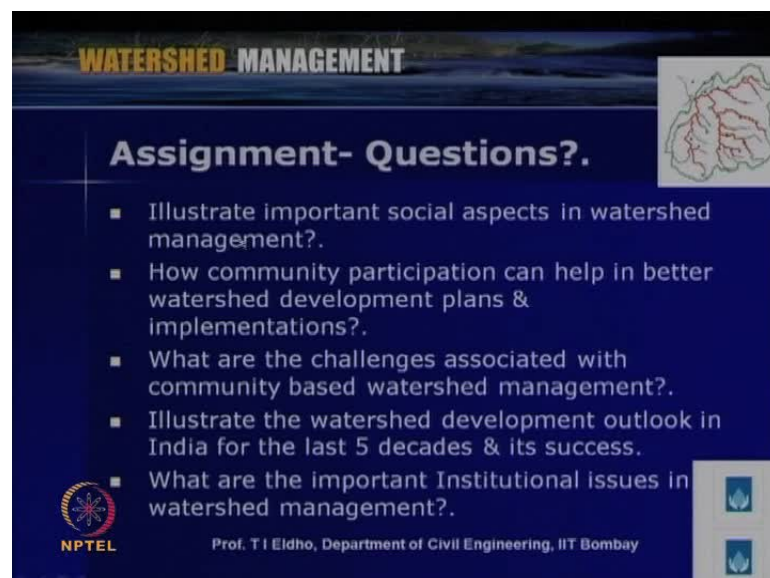
- Differentiate between past traditional & current watershed development approach plans.
- Discuss social aspects of watershed management within the perspectives of sustainable development.
- What are the important characteristics of community based watershed management?.
- Differentiate between direct intervention methods and participatory methods in watershed management.

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So, these questions you can answer by going through today's lecture, and some few self-evaluation questions - differentiate between past traditional and current watershed development approach plans.

Discuss social aspects of watershed management within the perspectives of sustainable development. What are the important characteristics of community based watershed management? Differentiate between direct intervention methods and participatory methods in watershed management.

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**WATERSHED MANAGEMENT**

### Assignment- Questions?.

- Illustrate important social aspects in watershed management?.
- How community participation can help in better watershed development plans & implementations?.
- What are the challenges associated with community based watershed management?.
- Illustrate the watershed development outlook in India for the last 5 decades & its success.
- What are the important Institutional issues in watershed management?.

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And further few assignment questions - illustrate important social aspects in watershed management? How community participation can help in better watershed development plans and implementations? What are the challenges associated with community based watershed management?

Illustrate watershed development outlook in India for the last 5 decades and its success. What are the important institutional issues in watershed management? So, most of this questions, you can easily answer by going through the lecture.

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**WATERSHED MANAGEMENT**

**Unsolved Problem!.**

- Study the various social issues in your watershed area.
- Develop an appropriate plan to solve social issues such as poverty, lack of employment, lack of education to children in your study area.
- Study how the "Community participation" can help better watershed management in your study area.
- Develop appropriate plans for community involvement in sustainable development & watershed management.
- Study the role of watershed user groups in your study area.

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And as a final, the unsolved problem - study the various social issues in your watershed area. Develop an appropriate plan to solve social issues such as poverty, lack of employment, lack of education to children in your study area.

Study how the community participation can help better watershed management in your study area. Develop appropriate plans for community involvement in sustainable development and watershed management. Study the role of watershed users group in your study area. So, this you can easily check out by going through some of the literature and today's lecture.

So, with this, today's lecture is over. So, we will discuss further the socio economical aspects as far as social issues of watershed management plans in the next lecture. Thank you.