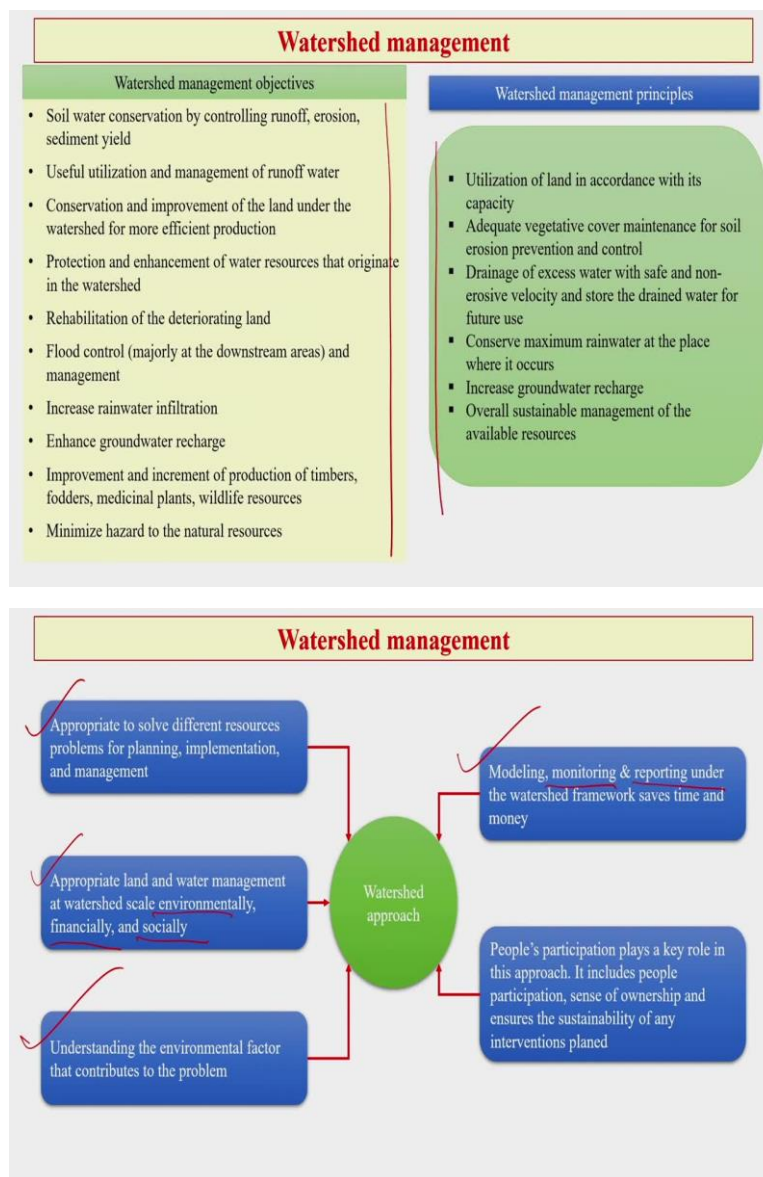


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Week - 04
Lecture - 23
Watershed Management

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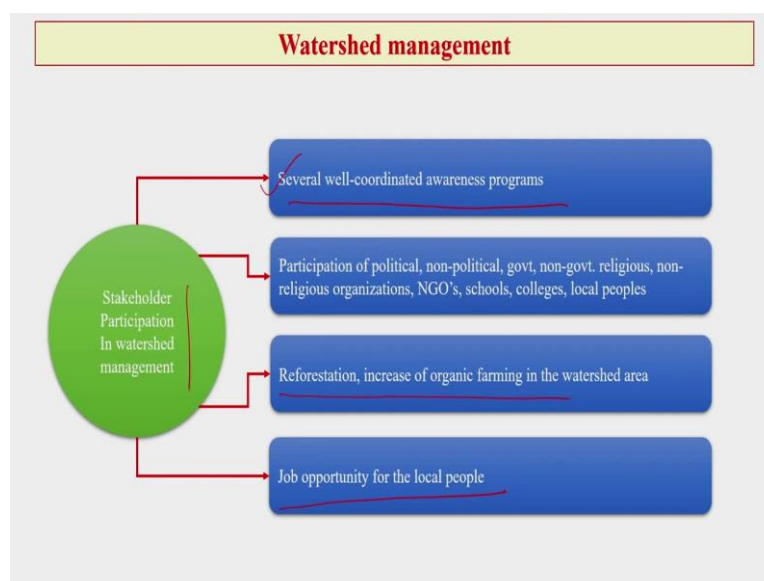
Watershed management, we need to know through various angles as you saw in the previous slide that it has certain set of objectives and also certain set of principles. So, following these,

let us now look at the different approaches that we follow in watershed management. Appropriate different resource problems for planning and implementation and management. This is one way watershed management which can help any administrator or any community to solve these problems in an appropriate manner. Watershed approach also assist or facilitate appropriate land and water management at the watershed scale environmentally, financially and socially, if you may recall that at the very beginning of this course, we discussed about five capitals, human capital, social capital, natural capital.

So, now, if you look at the watershed approach, it basically actually again links to those capitals that we talked about. It looks at natural capital, it took a social capital, human capital means the human resources, the skilled labor and the community. So, all these basic concepts, you will find that watershed approach is one way that it applies those things for better natural resource management. It also assists in understanding the environmental factor that contributes to a problem.

Nowadays watershed approach also facilitate different kinds of modeling, crop modeling, water modeling, erosion modeling, land use based modeling, it also helps in monitoring and reporting under the watershed framework that we discussed a couple of slides back. Then comes people's participation, which actually, watershed also allows for people participation in a very significant manner. It plays a key role in this watershed management approach. It includes people participation, sense of ownership, and also ensures the sustainability of any intervention that is being planned.

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So, next comes the role of various stakeholders in watershed management. You know that in any administrative unit, like say, the case of watershed, you will find there are various stakeholders, various actors who actually play an important and critical role for watershed management. So, stakeholder participation in watershed management is very, very important. We for successful watershed management need to keep these all stakeholder engaged for a better or sustainable management of resources.

Now, stakeholder participation can take place in various manners; it can be dialogue, discussions, working in the field together, outreach, so, various ways. But what is important is that several coordinated awareness programs can also be run through watershed management system. This approach allows also participation of political, non-political government, non-government, religious, non-religious organization, NGOs, schools, everyone whoever has a role to play in a watershed or any administrative unit, they can play their role for the betterment of the community, or betterment of the watershed towards natural resource management.

Watershed approach also allows reforestation in a very huge way, it helps in increasing organic farming also in the watershed area, it gives enough opportunities scopes to actually pursue organic farming. Job opportunity creation in watershed management is another aspect when you go for various kind of intervention in watershed, those will generate a lot of income. I will discuss about those kinds of technical and non-technical intervention at the watershed scale in later slides or maybe in the next lecture.

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Watershed management

Stakeholders role in watershed management

- ☒ Stakeholder identification
 - Includes international agencies, foreign govt. for climate change, biodiversity conservation, transboundary waterbody related issues
 - National agencies, NGOs for tourism, research, wood extraction, large dam, etc. construction
 - State govt. and other regional agencies for local-scale soil water conservation, irrigation projects, forest product usage
 - Local community for water supply and distribution, cultural sites.
- ☒ Characterisations of issues and problem formulation
- ☒ Discussion with local people (PRA/RRA exercise)
 - Includes focused group discussion, questionnaire survey, unstructured, semi-structured and structured interviews
 - Survey of the area
 - Restore ecological balance through community participation
- ☒ Understand the influence of the stakeholders

In case of watershed management, as I said that stakeholders play a very important role. Now, identification of stakeholder is an important task. There will be many stakeholder as I said, but for a successful watershed management and natural resource management, you need to identify the appropriate stakeholder or at least few of them, who will actually take the key role in the watershed management and this can include international agencies foreign government for climate change, biodiversity conservation, trans boundary water related issues, agriculture, universities, department, state government, regional agencies for various resource management, local community farmers. So, this identification of group or individual stakeholder is critical to the success of watershed management.

Now, the characterizations of issues and problem formulation in watershed are also important. So, there would be when you enter in any watershed area, you will encounter with many issues many problem. Now, it is important for us to focus on the most important one first now, this most important one how you will arrive that we have discussed earlier in ranking process. Pairwise ranking, ranking process, you can actually identify one or set of few problems, which you need to address at the beginning.

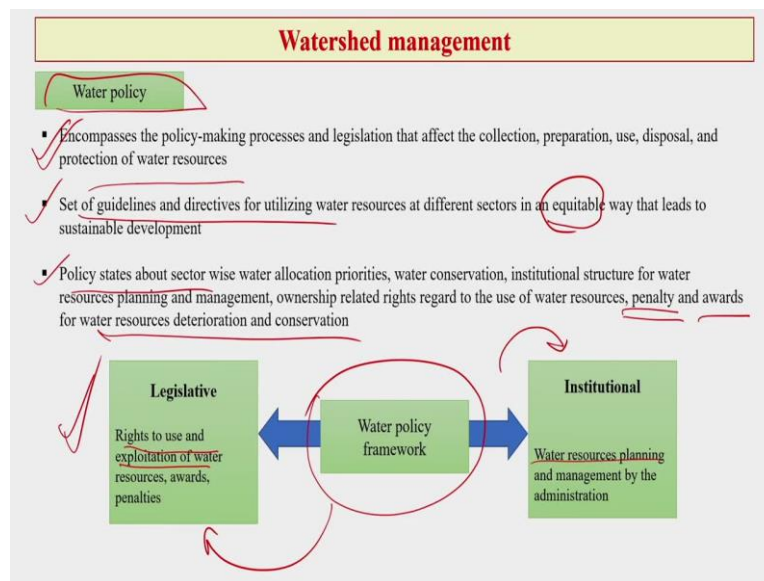
Now, next is discussion with local people and that process will automatically takes place when you go for participatory rural appraisal, which again we discussed earlier. So, participatory rural appraisal or rapid rural appraisal, this gives you enough opportunity to interact with local people and also various stakeholders. So, these are the aspects we already discussed under PRA that what actually we do during interaction with people so, I will just skip this part.

Then next comes to understand the influence of stakeholder. Again, a very critical point. Suppose there is one State Department say water resource department in one particular watershed is very active in comparison to the other department say PHD, public health or maybe agriculture, probably that department, water department are very aggressive, very active in that particular area for whatsoever reason. Now, naturally, the influence of that water resources department on the local community and their interactions, their relation with local community will be much stronger than the other.

So, when you go to plan for the management of watershed of that area, so you must include water resource department there. That does not mean that you will not include other, but you must not miss that department. So, because you need to understand that which stakeholder has quite a good amount of influence on the local community in that particular area, because

that helps you to carry out the different processes and systems within the watershed management approach.

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Now policies, policies we have many policies already in the existing system. Watershed management also allow or give enough scope to link various policies and various schemes through this watershed management approach, say for water policy. Now, water policy, it actually takes care of various kind of legislations, rules, laws that effect the collection, the preparation use disposal and protection of water resources.

So, we need to know about the power and the strength of these policies and then suitably you could actually bring in the watershed management because watershed management approach provides you that scope as well. A set of guidelines and directives will be available within water policies, which are already existing in our system for utilizing various water resources at different sectors in a equitable manner. Again, this word equitable is very important, which leads to the sustainable development.

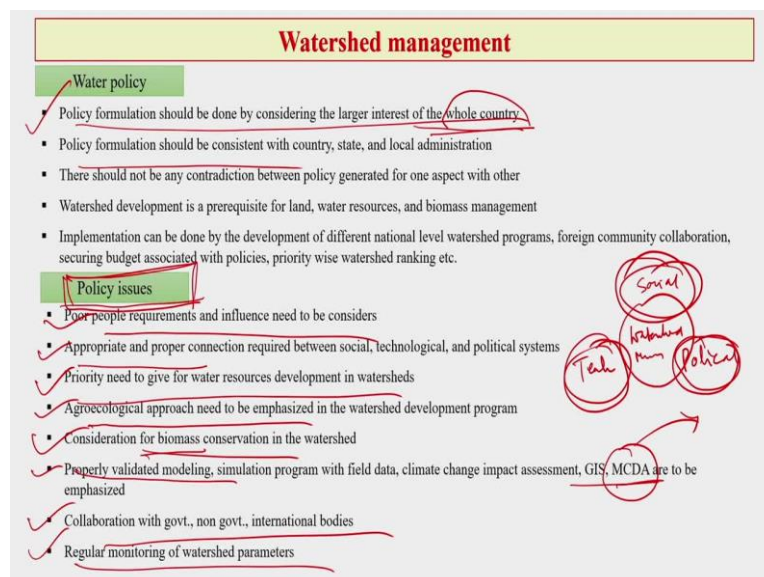
Then comes that policies again can talk about various sector and sector wise water allocation, sector wise water utilization is also very different. The amount of water used for agriculture and the amount of water used for industry could be very different. So, the different allocation priorities then, accordingly different water conservation measures, institutional structure for water resource planning and management and ownership related rights with regard to the use of water resources and if found defaulter, then what kind of penalty you can put or not and again, incentives or awards for taking care of water resources and rejuvenating it.

So, these are certain aspects within the water policy, which can basically allow your watershed management to function in a better manner. Let us look at this figure which simplify the thing that I have been discussing in the last couple of minutes. So, this is your

water policy framework, which in one hand looks at the institutional aspects. On the other hand, it looks as the legislative aspects.

In case of institutional aspects, it talks about various water resource planning management by different institutions starting from the Village Development Council, VDCs at the ground level and it could go up to even central government level. So, legislative rights, we just discussed about rights to water use and if you are misusing, then what kind of penalty also will be there, if you are managing water resources in a very appropriate manner, what kinds of incentives or awards can be given there, these are the things which can come in the legislative matter.

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Then comes continuation of water policy. Policy formulation for any sector, it should be done by considering the larger interest of the community and persists in the whole country because; suppose, we were doing a kind of a watershed management practice in a district in Uttar Pradesh or in a district in West Bengal or somewhere now, if you think only for that particular area, of course, that area development will be faster, but the global impact of your any intervention at the local level need to be also thought because the water, air these things does not go by no territorial boundary.

So, any kind of initiatives or action that you will be taking or implementing in any watershed in any part of the country, we must keep in mind that the impact of that might go into other parts of the country and thus to another country. So, there are various aspects of that, the interrelationships between various river ecosystem is one that I can cite in this aspect that where our or any other countries actions or planning can actually impact the other country.

So, this this is the point where actually we need to think globally even if we take the action locally.

Now, policy formulation also should be consistent with country, state and local administration. There should not be any contradiction between policy generated for one aspect with the other one watershed development also, it takes a huge amount of care for land water resources, agriculture, livestock. So, this entire picture needs to be seen in a very integrated manner. Implementation can be done by the development of different national level watershed program, at the district level, state level; foreign community collaboration can also take place.

These days, various international agencies also take a lot of interest in watershed development program. So, this kind of, integration can take place for bigger goal, not only for the particular area that you were working, but it can spread across the country and beyond.

So, there are of course, when we talk about policies related to any sectors, there are certain policy issues actually, which are involved with like poor people, requirement and influences we need to be considered and then appropriate and proper connection required between social and technological and political systems. We must prioritize to give water resource development in case of watershed management.

Agroecological approach needs to be emphasized in the watershed development program. So, policy issues are very important to know for us for watershed management, what are the policy issues that we must consider? When we work for a watershed development, certainly the majority of the population will be relatively poorer than any other place that you can think of.

So, we need to first understand the requirements of the poor people. And then we also need to consider the appropriate and proper connection required between the social, technological and the political system. So, these three components basically are very important that they work in tandem. So, if these three work in a proper manner, then you will see that your watershed management will work the way you actually want it to work.

So, the interaction and coordination between the social technological and political aspects into watershed management need to be taken care of. Priority need to be given for Water Resources Development in watershed, there is no doubt. Agroecological approach need to be

emphasized in the watershed development program, because, as you know that especially in our country, we have very diversified agro ecological system.

So, the watershed management approach or system or different intervention also needs to be thought on the basis of the agro ecology, where you are working. So, the way that you will be managing watershed in Rajasthan, it will be totally different in Assam because we know that Rajasthan is dry and it is mostly affected by droughts, whereas in Assam its fully wet and often affected by flood. So, two different completely ecosystem. So, the approach is in watershed development need to be different.

Consideration of biomass conservation in the watershed is another critical parameter; we need to properly validate different kinds of modeling or simulation program with field data. For even climate change impact assessment at the watershed scale we can always do we can use GIS, multiple criteria decision analysis can also be applied which we discussed during prioritization process it helps in prioritize your alternatives.

Collaboration with various governments, non-government international bodies are critical for the success of watershed management. Finally, you need to monitor the systems in a regular manner. Monitoring is key for the success of watershed management.