A Term Paper on

Legal and Policy Issues in Soil Conservation and Watershed Management in Nepal

(A term paper has been submitted for the partial fulfillment of the requirement of the subject Watershed management, modular course, M.Sc. forestry)

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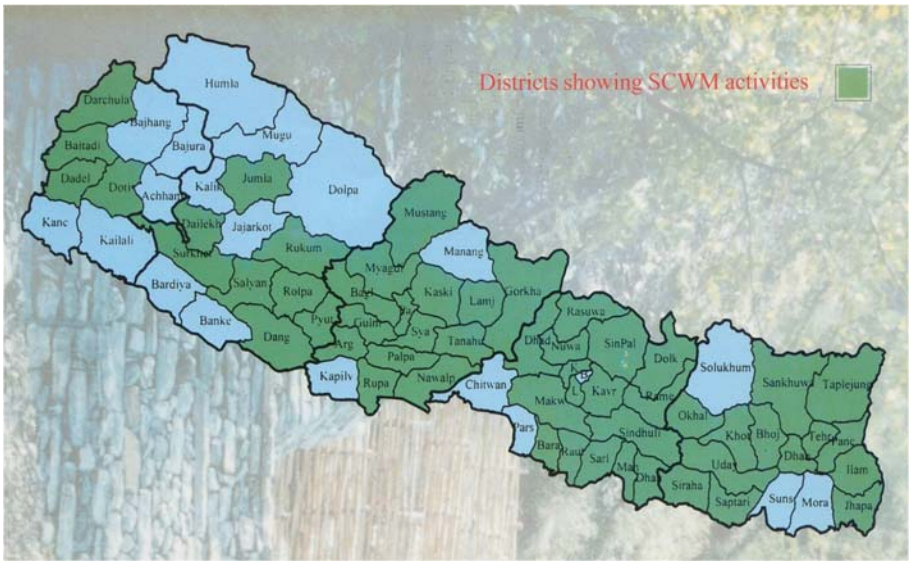

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Terminology

Legal is relating to, or concerned with law; authorized by or based on law; established by law; one that is in accord with certain rules or laws (RHI, 2006).

Policy is a plan or course of action, as of a government, political party, or business, intended to influence and determine decisions, actions, and other matters; a course of action, guiding principle, or procedure considered expedient, prudent, or advantageous.

Issue is a point or matter of discussion, debate, or dispute eg; legal and moral issues; a matter of public concern; a misgiving, objection, or complaint (The American Heritage, 2003).

Soil conservation is rational management of land and water resources for sustained and economic production by creating minimum hazards to natural resources (Sthapit, 1998).

Watershed Management is the application of the soil conservation measures in the watershed as a working unit (Ball and Tiwari, 1999).

Abstract

In Nepal, Department of Soil Conservation and Watershed Management (DSCWM) is the main governmental institution for the formulation of the policies and legislation related with soil conservation and watershed management. DSCWM has been planning, implementing and monitoring soil conservation and watershed management (SCWM) activities based on the principles of integrated watershed management. This paper highlights the policies and Legislation related to soil conservation and watershed management issues concerning Nepal. It covers the future and present policies, strategies, and activities regarding the watershed management adopted by our government.

The methodology adopted for this term paper consisted of collecting and reviewing available secondary sources of data/information, such as, evaluation reports, workshop proceedings, relevant books and articles from libraries and internet. This paper suggests future Watershed Management endeavors in order to achieve successful results.

Key Wards:

Legal, Policy, Issues, Soil Conservation, Watershed Management

1. Introduction

Nepal has sharp physiographic and climatic contrasts despite its small area. About two-thirds of the country is composed of hills and mountains with steep to very steep slopes. It has several watersheds ranging from big basins to micro-watersheds of the smallest size, where more than 90% of the total population live and practice subsistence farming. Many of these watersheds are in a state of physical and biological deterioration due to over-exploitation of natural resources (Wagley 1996).

Soil erosion is an inherent characteristic of Nepal's physio-climatic and socio-economic conditions. The combined effect of geologically unstable, steep and rugged mountain topography and intense monsoon rainfall make the country prone to high soil erosion rates. Cultivation of marginal hill slopes to meet the demands of increasing population further aggravates the naturally high soil erosion rate (Pandey, 2008). Deforestation, overgrazing and poorly maintained marginal lands contribute to the degradation of our watersheds. In addition, other human activities such as improper land use, unscientific cultivation practices and construction of development infrastructures without integrating conservation measures have also exacerbated the problems of soil erosion, landslide, flooding and environmental degradation.

2. Evolution of SCWM Activities in Nepal

A systematic approach to Watershed Management (WM) was first adopted in Nepal in 1966, when the United Nations Development Program (UNDP), FAO and the Government of Nepal jointly initiated a pilot project called Survey and Demonstration for the Development and Management of the Trishuli Watershed. Its aim was to serve as a demonstration scheme for identifying the most suitable approach to mountain area development (Bajracharya and Aung, 1966).

Evolution of participatory Watershed Management in Nepal

Stage I (1974–1980): Awareness of soil conservation was first raised. The government implemented small-scale activities in pocket areas, with little involvement of local people.
Stage II (1981–1985): People became involved in assessing needs and discussing the implementation of field activities.
Stage III (1986–1990): Information on SCWM activities was shared with local elected bodies – VDCs and DDCs. CBOs received assistance for implementing activities.
Stage IV (1991–1994): Guidelines for people's participation were developed, and almost all SCWM activities were implemented through user groups. Sub-watershed management planning was institutionalized.
Stage V (1995–2000): User groups became the focal point for implementing SCWM activities. Efforts were made to institutionalize the groups through formal registration and their development into cooperatives. **Source:** Wagley and Bogati, 1999.

In recognition of critical situation of soil erosion and watershed degradation in the country, Government of Nepal established the Department of Soil and Water Conservation in August, 1974 under the then Ministry of Forests. In 1980, it was renamed as Department of Soil Conservation and Watershed Management (DSCWM) to better represent its roles and responsibilities of watershed management (DSCWM, 2008).

Three years of work (1975 to 1977) in the Phewa Tal catchments in west-central Nepal by the Department of Soil and Water Conservation, Agriculture, Forest and Water Supply was the first project to work for the integrated management of a water catchment (Fleming, 1983).

After the inception of integrated rural development (IRD) projects in 1982, soil and water conservation activities were implemented under a two-pronged strategy of dispersion and concentration. However, activities were not properly integrated, and project results were disappointing. This led the government to recognize the need to adopt an integrated and holistic approach to WM.

In the mid-1980s, sub-watersheds were considered the appropriate unit for WM interventions, and it was recognized that local people must be involved in the planning and management of watershed resources (TDR, 1988). The 1988 Master Plan for the Forestry Sector (MPFS) also emphasized the importance of people's participation and integrated approaches in WM. Thus, local people started to be actively involved in sub-watershed activities.

Since then, the Department has planned, implemented, and monitored soil conservation and watershed management activities within the framework of the principles of integrated watershed management (Acharya, 2000).

At present, DSCWM operates WM programs in 56 of Nepal's 75 districts. A number of bilateral and multilateral donors support Soil Conservation and Watershed Management (SCWM) activities in different parts of the country. The government has followed the sub-watersheds approach to integrated WM since the ninth five-year plan (1997/98 to 2001/02). Each district is divided into a number of functional sub-watersheds of 15 to 25 km^2, which are prioritized according to the land-use and land system characteristics, erosion severity, population density; and the SCWM program is then implemented in the most critical sub watersheds (DSCWM, 2008).

3. Legal/institutional Framework for SCWM

The Ministry of Forests and Soil Conservation (MFSC), is responsible for policy formulation and planning for sustainable soil conservation and watershed management (SCWM). The Ministry has five departments, each with specific management responsibilities that affect forests:

1. Department of Forests (DF)
2. Department of Soil Conservation and Watershed Management (DSCWM)
3. Department of National Parks and Wildlife Conservation (DNPWC)
4. Department of Plant Resources (DPR)
5. Department of Forest Research and Survey (DPRS)

4. Policies and Activities of DSCWM

DSCWM has been planning, implementing and monitoring soil conservation and watershed management programs/activities based on the principles of integrated watershed management. To reflect the multi dimensional needs of SCWM measures, DSCWM is staffed with multi disciplinary personnel. Foresters, agriculturist, civil engineers, chemist and geologist are the main disciplinary staffs in the department (Pandey, 2008).

4.1 Policies and Strategies

DSCWM has adopted the following policies and strategies for Soil Conservation and Watershed Management (DSCWM, 2008):

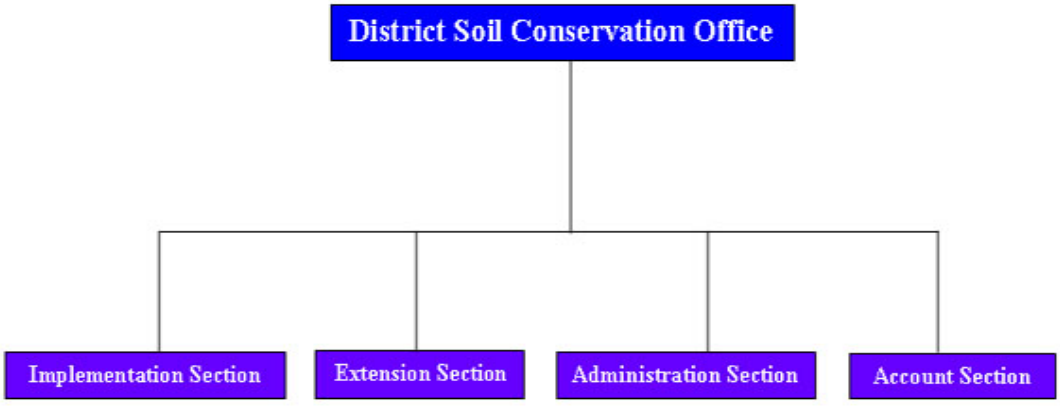
- Ensure proper land use by rational land use planning.
- Implement integrated package programs that include vegetative, agronomic and water management measures to tackle erosion problems taking the sub-watershed area as the unit of planning, implementation and management.
- Ensure the multiple use of land and water to fulfill diverse needs.
- Operate Soil Conservation and Watershed Management (SCWM) programs in line with the integrated watershed management approach.
- Establish linkages and networking with all other related sectors like forestry, agriculture, livestock, water and land resources.
- Ensure people's participation through conservation extension education and demonstration of appropriate technologies.
- Adopt ways and means of minimum damage to the environment during the construction of development infrastructures.

- Protect important watersheds (e.g. upstream of hydroelectric dams, irrigation systems) and riverbanks through plantation and the other conservation measures.
- Expand and institutionalize SCWM services in all districts of Nepal.
- Focus on conservation activities in the Siwalik region and other marginal lands.
- Enhance capacity of technical manpower of DSCWM by providing knowledge, skills, and technologies related to various aspects of SCWM through trainings and workshops.

Numerous WM user and community development groups have been trained in community-level WM activity planning and implementation. Partnerships have been built with local non-governmental organizations (NGOs) and Community Based Organizations (CBOs), and SCWM activities are implemented jointly in some districts (Pandey, 2008).

4.2 Organizational Structure of DSCWM

Organizational Structure of District Soil Conservation Office



4.3 Soil Conservation and Watershed Management Programs Activities

In a continuing endeavor to meet departmental objectives in line with the policies and strategies, the department has incorporated the following SCWM programs and activities;

1) Land Use Development Planning
    a) Sub-watershed prioritization
    b) Watershed management planning
    c) Sub-watershed management planning, and
    d) Technical service for land use development
2) Community Integrated Watershed Management Program
    a) Land Productivity Conservation
    b) Development Infrastructure Protection and Development
    c) Natural Hazard Prevention
    d) Community Soil Conservation and Extension
3) Community Mobilization and Empowerment
4) Nursery Establishment and Seedling Production
5) Maintenance and Improvement
6) Technology Development, Study, Research and Mapping
7) Monitoring and Evaluation

5. Legal Considerations in Soil Conservation and Watershed Management

One of the implementation strategies is the legal strategy. Rules and regulation are formulated in order to make the people follow them and implement the necessary soil conservation and watershed management activities with or without the government's support. The important legal strategies of Government of Nepal are following;

5.1 Acts and Regulations

5.1.1 Soil and Water Conservation Act 1982 and regulation1985

The Soil and Water Conservation Act was promulgated in 1982, followed by the Soil Conservation Regulation in 1985. These give authority to the Government to declare any area of the Nepal as a protected area by notification in the Gazette. Government has power to regulate prescribe land use practices on private, community and public land and to implement various conservation measures in these areas (HMG/N, 1985).

5.1.2 Water resource Act- 1992 and Regulation 1993

This act covers the water resource of surface and undergrounds. The Act states, “No persons shall be entitled to utilize the water resource without obtaining license.

5.1.3 Forest Act 1993 and Forest Regulation 1995

"National Forest" mean all Forests excluding Private Forests within the Kingdom of Nepal, Whether marked or unmarked with Forest Boundary and the term shall also includes waste or uncultivated lands or unregistered lands surrounded by the Forest or situated near the adjoining forest as well as paths, ponds, lakes, rivers or streams and riverine lands within the Forest.

The Act and the Regulations provide the legislative and regulatory basis for implementing the policies formulated in the National Forestry Plan and the Master Plan for Forestry Sector. The current community forestry program emphasizes the formation of user groups as new Community social organizations. The Forest Act 1993 enshrined the concept of user group or community forestry. More than 14,431 forest user groups have been recognized and more than 12, 29,125 ha been placed under user group management (DoF, 2008).

Legislation related with Soil Conservation and Watershed Management

1. Soil and Watershed Conservation Act 1982 and Regulation 1985 Regulation 1985
2. Master Plan For Forestry Sector 1988/98
3. Water Resource Act 1992 and Regulation 1993
4. Forest Act 1993 and Regulation 1995
5. Water Resource Strategy 2002
6. National Water Plan 2005

Supportive Legislation for Soil Conservation and Watershed Management

1. National parks & wildlife conservation Act 1973
2. Electricity Act 1992
3. Prospective Land Use Plan 1986
4. The APP 1995
5. Nepal Environmental Policy and Action Plan 1993
6. National EIA guidelines with regard to industry, projects,; protected areas & forests
7. Environmental Protection Act 1997

5.2 Plan and Strategies

5.2.1 Master Plan for the Forestry Sector 1989-2010

The Master Plan for the Forestry Sector (MPFS) prepared by the Ministry of Forests and Soil Conservation and approved by the government in 1989 provides a 21-year policy and planning framework. The MPFS guides forestry development within the comprehensive framework of six primary and six supportive programs to achieve its objectives. The main features of the Master Plan lie in an integrated and program-oriented approach to forest and

watershed management. This program approach was a turning point in the history of Nepal's forestry sector policy (MFSC, 1989).

5.2.2 The Forestry Sector Policy 2000

The Ministry of Forests and Soil Conservation has formulated a revised forestry sector policy. This is an updated version of the Master Plan and subsequent amendments. The objectives of this policy are to protect land from degradation by soil erosion, floods, landslides, desertification, and other ecological disturbances, to promote people's participation in land and forestry resource development, management, and conservation. This forestry sector policy is especially important in that it provides a framework for the systematic implementation of the various development programs in the sector (MFSC, 2000).

5.2.3 Water Resource Strategy - Nepal 2002

Achieving the sustainable development of water resources requires emphasizing the development of the country's water resources from a holistic perspective that brings environmental considerations into the mainstream of the Water Resources Strategy and subsequent implementation (DSCWM, 2008).

5.2.4 National Water Plan - Nepal 2005

The sub-sector water plans have been developed for implementation which will help to achieve the objectives of the national water plan. Environmental Action Plan on Management of Watersheds and Aquatic Ecosystems is one of the important sub-sector plans. The overall environmental targets are as follows:

- By 2007, a management plan for nationally important watershed and aquatic system is prepared and initiated; water quality and wastewater quality standards are developed and enforced.
- By 2017, full-scale environmental protection and management projects are implemented in all priority watershed and aquatic ecosystems; stakeholders are participating in environmental protection and management.
- By 2027, quality of watersheds is increased by 80% in all regions; adequate water quality for aquatic habitat, including fish, human consumption and recreation is insured in all rivers and lakes.

5.3 Five Years Plans

5.3.1 Seventh Five-Year Plan (1985-1990)

The Seventh Five- Year Plan ensured maximum people's participation in activities related to soil and water conservation by giving priority to protecting of the water sources of villages and to the watersheds serving heavily populated areas of the hills. Although the intentions of the plan were noble, the policy declarations were ineffective because of in the absence of strong implementing institutions (HMG/N, 1985 cited in MFSC, 2000).

5.3.2 Eighth Five-Year Plan (1992- 1997)

The Eighth Five-Year Plan followed the Master Plan to continue its main thrust of people's participation in forest management. The basic objectives of the Plan included; Help maintain land fertility through the conservation of soil and other watershed resources. The policies have been adopted to achieve objectives is Public participation in the prevention and control of soil erosion will be encouraged (NPC, 1992 cited in NPC, 1997).

5.3.3 The Ninth- Year Plan (1997-2002)

The plan more focus on maintained environmental balance by minimizing the water -induced disasters as flood, landslides, soil erosion etc. priority will be given to Chure watershed program and has been initiated in the 13 districts of the country. Following the principle that users are the center of the management of the resources a system has been developed to transfer the responsibility of the implementation of the program to the users group (NPC, 1997).

5.3.4 Tenth Five-Year Plan (2002-2006)

The tenth plan emphasized on the traditional knowledge and skill and scientific management along with the people's participation, partnership program of NGOs and users groups. The plan planed to the sustainability and durability of big irrigation and hydro projects the integrated watershed management program, especially in Chure region, will be implemented by mobilizing even the investment for such projects. Long-term strategy of tenth plan was to formulated plan by including technical, economic, social and practical aspects of the soil and watershed management (NPC, 2002).

5.3.5 Three Year Interim Plan (2007/08 – 2009/10)

The main objectives of three year plan is to contribute to poverty reduction by increasing income generating opportunities through decentralized and sustainable management of

forests, plants, herbs, soil and watershed, environment, bio-diversity conservation and protected areas, and development of forest entrepreneurship for the sustainable development of the forest and watershed sectors through people's participation (NPC, 2007).

The **Strategies** of this plan is to implement participatory, integrated and coordinated watershed management program in the Chure region; to go on expanding the Soil and Watershed Management Program by strengthening it and to make research, technology promotion, dissemination, extension, monitoring, and evaluation system effective.

6. Process and Mechanisms of Policy Formulation in SCWM

Policies related to soil conservation and watershed management are formulated following a specific procedure. Soil Conservation and Watershed Management departments produce policy outlines and forward them to the ministry for debate. The ministry then seeks the views of its senior staff and a draft policy is prepared. The concerned ministry then sends the draft policy for an expert review to the Ministry of Law and Justice. After finalizing the draft policy, the concerned ministry sends it to parliament. A sub-committee of the parliament discusses the draft and sends it to parliament for debate. Once it is approved by parliament it appears in the Gazette as legislation (DSCWM, 2008).

7. Issues in Soil Conservation and watershed Management

Despite successful over 30 years' history of department of soil conservation and watershed management, there are some issues, which have not received sufficient attention by the ministry. Broadly, we can classify these issues in following categories.

1. Legal and policies issues
2. Socio-economic issues
3. Issues in people's participation
4. Issues in research and development
5. Political issues
6. Field Structure

7.1 Legal and policies issues

Legal means of implementation is more of the top-down approach whereas, people's participation of development by the people has been main implementing theme of to-days' strategies. Therefore, legal means of controlling landuse seems absolute. So far, the department of soil conservation has not been able to declare in a single watershed (Stapit,

1998). Following are the main Legal and policy level issues in Soil Conservation and watershed Management

a) **Silent Documents**: Many policy documents stress the need for watershed management for poverty alleviation, environmental sustainability and nation building, but many of these documents are silent on implementation strategies (Paudel, 2003).
b) **Overlapping Responsibilities**: In Nepal, watershed management is covered in seven pieces of legislation: Soil and Watershed Conservation Act, 1982; Land Act, 1964; National Parks and Wildlife Conservation Act, 1973; Environmental Protection Act, 1996; Forest Act, 1993; Water Resource Act, 1992; and Local Self-Governance Act, 1999. However, this legislative framework suffers from overlapping responsibilities, unclear jurisdiction for implementation, lack of clear-cut resource allocation for watershed management and lack of emphasis on ground-level coordination. (Guragain et al., 2002). For example, the Local Self-Governance Act, 1999 gives the right to protect or manage local resources to local bodies (VDCs and district development committees), but other acts work through central bodies and district line agencies. This leads to overlapping of responsibilities on jurisdiction, accountability and liability.
c) **Government Previous Policies**: National forest Privatization Act 1957, The Pastureland Nationalization Act of 1974 and The Land (Survey and Measurement) Act of 1963 indirectly hinders forestry development because forestland is defined as government land and people started to cut tree and destroyed it vigorously (Dutta, 2008).
d) **Inflexible Policies/ Lack of Amendment:** The Act and Regulation sound too restrictive in using land by framers (Sthapit, 1998), for example the Soil and Watershed Conservation Act 1982, still existing without any kind of amendment despite of changing situation of the country in these 26 years .
e) **Long Administrative Procedures:** The procedure for declaration of protected watershed is very long. It has to start at the field and has to end up at the cabinet (Sheng, 1999).
f) **Low Institutional Capacity and Network:** The DSCWM is not sufficiently organized to tackle the ever-increasing problems of SCWM. The department faces an acute shortage of the qualified personnel required to plan, manage and implement program activities that are based on dynamic approaches to WM (Singh et. al, 2004).
g) **Weak in planning process**: Sub-watershed management plans are seldom referred to during the annual planning process. This results in a mismatch between annual plans and sub-watershed plans. The technologies that are being developed for the Middle Mountains

do not suit the rest of the country. Some of those developed for the Siwaliks and Terai regions have not yet been tested and evaluated (Singh, 1999).

h) **Lack of Data and Information:** Other than population density, very few socio-economic data are used. Furthermore, the data collected may be analysed but are not reflected in activity plans. The most pressing issue concerning watershed management is inconsistencies in socioeconomic databases. Even single-date socio-economic databases of watersheds are not available, never mind time series information. Watershed studies collect socio-economic information only as per need at the time of a study. Such data cannot give information over time about people (Achet, 1998).

   In Nepal, there is a lack of information and management plans at the watershed level. Nepal's watersheds have not been properly evaluated according to their resource endowment and degree of fragility. The Nepalese government does not have a land parcel system that delineates land by most appropriate use. Watershed-based data are available only by administrative unit, and these units only sometimes coincide with physical boundaries. Time series data for human-induced factors are lacking, and most studies have failed to separate out natural and human causes (Paudel, 2003).

i) **Monitoring and Evaluation (M&E) Issues**: Guidelines for monitoring social and cultural factors are lacking. M&E concentrates on managerial and financial aspects, but not technical ones. Technical indicators for selecting program activities that are suitable for local conditions have not been adequately identified and updated. The contribution made be people's participation is not recorded. Dissemination of M&E information is lacking at all levels. M&E does not determine the effectiveness or relevance of activities. It provides neither information on past efforts, nor suggestions for future improvements (Singh et. al, 2004). There is no institutionalized effort to evaluate the strengths and weaknesses of SCWM policy as a way of predicting outcomes.

j) **Lack of Skilled resources**: Another serious problem is that the DSCWM district offices often lack adequate resources and skilled personnel. SCWM encompasses multidisciplinary and multisectoral approaches, messages and themes. However, professionals and technicians are unable to disseminate them effectively.

k) **Technical Issues:** It demands details landuse planning which required intensive work, resource and in-depth technical know-how, which has been major constraints. The watershed areas are too big for the available resource. The base maps used for land-use and land system information are out of date (Sthapit, 1998).

The technical approach to sub-watershed management is based entirely on a desk methodology, which has not been verified in the field.

l) **Research, Demonstration and Dissemination Issues**: Research information and experiences from the field are neither documented nor disseminated. WM activities are increasing, but appropriate research and demonstration efforts are not keeping pace. Demonstration plots are not properly maintained, making it difficult to express the quantitative and qualitative impacts of SCWM activities. The research and demonstration section is understaffed and underequipped, which reduces its ability to carry out research. There is virtually no global- or regional-level networking of existing research and knowledge. Research and demonstration are a low priority and receive inadequate resources. No systematic plan for research and demonstration has been developed.

m) **Issues in Upland and low land watershed management and Benefit sharing mechanism:** There is no legal framework for institutionalizing Upland and Lowland WM user groups. As a result, such groups are unable to guarantee continuity (Shrestha, 2008).

n) **Lack of Integration and Dialogue Between Parties:** SCWM interventions have not been as effective as expected because of a lack of integration (Sthapit and Bendtsen, 2000). Because SCWM activities are scattered over large areas without proper integration their desired benefits are diluted. Although some indigenous technology and knowledge have been documented, there are still gaps in the identification and application of such technologies. There is no mechanism for regular dialogue and policy review and evaluation.

o) **Extension Activities:** Extension activities are carried out on an ad hoc basis. Extension materials are developed to meet general needs, rather than real needs. The extension program has focused only on generating awareness, and has made no effort to promote the adoption of technology (Singh et al., 2004).

p) **Instable political situation**: The instable political situation of the Nepal is one of the causes for the low implication of the law and policies.

q) **People's Participation Issues:** Most professionals and technicians lack knowledge of the fundamentals of the participatory approach. No comprehensive study has been carried out to find the best mechanism for involving local people in SCWM activities that are appropriate for their specific environmental and socioeconomic conditions. The participatory mechanism does not address issues related to legitimacy, resources, attitudes and withdrawal from program activities.

r) **Implementation without Field-Testing:** A large number of income-generating activities have been implemented without field-testing or consideration of their cost–benefit ratios. Some of the income-generating activities that have been introduced are detrimental to the WM program. Income-generating activity programs have not reached the poor, marginalized groups and women. SCWM activities are launched on a co-financing basis, but there is no cost-sharing mechanism for activities other than terrace improvement. In addition, users' contributions are not reflected in annual plans, even though they are quite significant.

s) **Remittance Drive Economy and Low National Production**

Nepalese working in foreign countries has deprived these areas of workers. This has led to increasing wages for agricultural labors. This has led to decreasing labor inputs in the farming sector, which in turn has led in many places to the abandonment of basic tasks such as terrace maintenance and the subsequent environmental degradation of mountain watersheds (Poudel, 2003).

8. Policy & Institutional Considerations in Soil and watershed Management

When attempting to create a statement that comprehensively captures a problem or issue within watershed, following should try framing the problem in terms of its: Policy and institutional considerations (Gaire, 2006).

1) Define the existing policy/regulatory framework (policies, regulations, standards)
2) Identify the institutions / jurisdictions involved:
    a) authority & mandate
    b) roles & responsibilities
    c) specific programs and initiatives
    d) decision making mechanisms
3) Describe availability of resources (staff, budget, information models, etc.)

9. Way forwards/ Future Strategies for the Effective Planning and Implication

Develop a long-term comprehensive policy that is specific to WM and involves the participation of all stakeholders. Such a policy should include a vision, mission and strategic directions for the next generation of WM program. It should also clearly define the scopes and mandates for WM. Some of the strategies for the effective planning are given below;

a) **Land Use Planning:** Land use planning will be introduced in order to enhance the productivity of the resource base and for striking a balance between the conservation and

the sustainable use of natural resources (DSCWM, 2007). Establish integrated land-use plans that reflect an appropriate balance between conservation, production and sustainable livelihood needs from forests (ITTO, 2002). Determine the specific physical and environmental risk and stress factors for the area that is being restored, rehabilitated, or managed as secondary forest. To do so, assess and monitor the physical site conditions (ITTO, 2002).

Develop and implement land and forest resource development programs based on the concept of land use planning. Provide measures for the conservation of land and forest resources. Utilise resources only after taking into account environmental repercussions.

b) **Integration of the Upstream User and Downstream User:** Develop a policy that strengthens coordination among relevant sectors and upstream–downstream linkages, so that benefits can be shared (Singh, et al., 2004). The interests of people living along a watershed vary, from upstream source to downstream sink vary, and implementation must (Paudel, 2003):

   I. Identify who the stakeholders are;
   II. Make it clears whether watershed management is the responsibility of local people,
   III. Stakeholders outside the watershed or central-level managers;
   IV. Specify the appropriate size of area for forming focus groups or community-based organizations; and
   V. Specify how inter-boundary resource use disputes are tackled.

c) **Watershed Management Maps and Environmental Database**: Incorporate additional, updated maps, a procedure based on Geographic Information Systems (GIS) and relevant national data (i.e. on livestock, soil types, geology, morphology and potential or actual productivity). Incorporate sociological data, such as poverty and gender indices and aspects. Ensure that a sufficiently flexible approach can be followed (Singh, et al., 2004). Establish an information and Meta data center on Soil and watershed management. Develop nationwide soil conservation and watershed monitoring system. Collect biophysical and socio-economic information on watersheds and aquatic systems. Compile indigenous knowledge and skills on watersheds and aquatic systems (DSCWM, 2008).

d) **Enhance Institutional Capacity and Coordination:** Strengthen capacity of government institutions should be enhanced. Establish coordination committees to integrate watershed and aquatic ecosystem management program and water-based infrastructure development projects. Promote involvement of NGOs in SCWM (DSCWM, 2008).

e) **The Role of the Private Sector:** Establishment of private forests, herbal farms, and wildlife ranching on private land will be encouraged (FAO, 2003). Similarly, the establishment and development of forests on leasehold government land will be promoted as long as such forests are socially acceptable.

f) **Social Aspects of Land and Forestry Resources:** Encourage people's participation through effective conservation education and through extension activities including communication and demonstration (Singh, et al., 2004). Use people-centred planning processes to increase the availability of public land and to best serve the interests of the people. Give priority to the interests and knowledge of local stakeholders when managing degraded and secondary forests and adapt management strategies to local socio-cultural and economic conditions.

   Provision of legal arrangements for the management of aquatic ecosystem through community participation. Establish community-based institutions. Strengthen institutional capacity. Promote community-based research and demonstration (Pandey, 2008).

g) **Map Important, Critical and Priority Watersheds and Aquatic Systems:** Identify important, critical and prioritized watersheds and aquatic ecosystems base on the latest land use map. Develop high-resolution maps of important, critical and prioritized watersheds and aquatic ecosystems, pasturelands and Siwaliks/Churia. Prepare erosion hazard map. Prepare hydro and meteorological maps. Update maps on regular basis (DSCWM, 2008).

h) **Conservation of Biodiversity, Ecosystems, and Genetic Resources:** A landscape planning approach to managing biological diversity on an ecosystem basis will be initiated. In order to conserve forests, soil, water and biodiversity while at the same time meeting the basic needs of the people on a sustainable basis, land and forestry resources will be managed and utilised according to their ecological status (Pandey, 2008).

i) **Protection, Rehabilitation and Management Programs:** Prepare watershed management plan of important, critical and priority watersheds.Implement a rehabilitation program on degraded watersheds.Implement a land productivity conservation program on degraded watersheds. Implement a Siwalik/Churia conservation program. Promote the Special Area Land Treatment (SALT) model.

j) **Net Working and Integrations:** Net working among different CDGs within watershed area should be built up in order to share their ideas, experiences and to work on partnership basis for the sustainability of the program. Promote Community Participation in the Management of Watersheds and Aquatic Ecosystems (Pandey, 2008).

k) **Public Awareness Program:** Awareness program should be launched specially focus on socially disadvantaged groups. Implement Water Conservation Education Program. People should Idea about the Country Policies and Legislations. Cultivation practices should be practiced according to the nature of the landscape, so people should be ware and adaptation of conservation framing system and SALT Technology (Gaire, 2006).

l) **Ensure Compliance with Environmental Impact Assessment (EIA):** Reassessment of EIA Acts, rules, regulations and processes. Develop/approve EIA guidelines for irrigation, hydropower, drinking water and other economic use of water. Strengthen compliance monitoring system (DSCWM, 2008).

m) **Design and Implement of Training Program :** Support academic/training institutions to incorporate a water and environment management course. The micro-catchment development model should be adopted to solve local watershed-related problems according to the need of discrete areas.

n) **Promote Research and Studies:** Promote research and studies on ecological water requirements, water quality, functioning of glacial lakes, existing dam structure and climate change and its impact on the environment. Promote applied and participatory research to extend and communicate knowledge and experiences on all aspects of SCWM, secondary forest management and the rehabilitation of degraded forestlands (ITTO, 2002). Integrate formal research findings and local traditional knowledge into the management and monitoring of forest restoration and rehabilitation activities.

o) **IGA and Training program for Poor and Marginalized People:** Emphasis should be given to the cultivation of cash crops, vegetables and fruit, rather than goat keeping from soil conservation and watershed management point of view and to gain long term impacts. Market of their IGAs should be ensured to involve people in IGAs. Training should be given to the existing occupational cast (Sarki, Damai and Kami) to enhance their professional skills. Promote the local-level and value-added production and processing of wood and non-wood forest products. Recognize gender-specific issues and other opportunities for labor as important determinants of the local acceptability of forest-based economic activities. Develop opportunities to partner with communities, projects or institutions (public and private) with processing and marketing experience to strengthen efforts to gain access to markets

p) **Formation and Support Local Institutions:** Community forestry as well as soil conservation and watershed management programs should be conducted simultaneously.

q) **Low Cost Soil Conservation Measure Should be Adopted:** Bioengineering should be promoted to increase the life span of established structures for soil conservation.

r) **Effective Monitoring and valuation System:** Incorporate M&E into program plans, and allocate resources for it. Develop and update technical indicators that help the selection of appropriate program activities for different localities. Develop a participatory M&E system. Incorporate gender and social equity monitoring into WM objectives. Develop a uniform reporting system to provide feedback (Singh, et al. 2004).

s) **Effective Punishment System:** Punishment should be given to the groups and members if activities are incomplete.

t) **Explore New Potentiality:** Assess the potential impacts of climate change on watershed landscapes, and develop and/or integrate adaptation responses as appropriate.

u) **Fund Management**: Increased investment in planning, extension, training, and monitoring and evaluation (M&E) is needed in order to support the expansion of DSCOs.

Departmental Guidelines and Working Procedures

1. Basic Guidelines for Sub-watershed Management Planning, 1994 AD.
2. Guidelines for People's Participation in Soil Conservation, 2050 BS.
3. Cost Estimation Guidelines for Soil Conservation Activities, 2051 BS.
4. Monitoring and Evaluation System and Guidelines for Soil Conservation and Watershed Management Programs, 2052 BS.
5. Guidelines and Methodology for Sub-Watershed Prioritization in Watershed Management Planning, 1997 AD (2053 BS).
6. Soil Conservation and Watershed Management Activities (Definition, Objective, Scope and Working Strategy), 2001 AD.
7. Working Procedure (Karyabidhi) of Department of Soil Conservation and Watershed Management, 2061 BS.
8. Logframe of Soil Conservation and Watershed Management Programme, 2007 AD (2064 BS).

The small watershed approach was found to be more successful than the large watershed approach in terms of incorporation of user group demand and input into planning and Implementing an activities, use of appropriate (low cost, locally available) materials in the design and construction of infrastructure, local cooperation for long term protection of an area (TRD, 1988) and recommended the following:

1. High priority should be given to protect and manage existing natural forests and grazing lands with the cooperation of local people.
2. District Forest Offices should closely work with the local people in the preparation and implementation of sustained yield forest management plans.

3. Site selection and planning should include an economic analysis; appropriate materials to be used in the cheapest, technically effective solution and water diversion and Protection from grazing at gully sides and headcuts.
4. NGOs can work effectively and collaboratively with Government' s implementing agencies at t the local level. Foster and support user groups in all phases of project conception, initiation.

Organizations Directly/Indirectly involved in SCWM Policy Formation

1. Dept. of Soil Conservation and Watershed Management
2. Dept. of Forests
3. Dept. of Water Induced Disaster Prevention
4. Dept. of Irrigation
5. Dept. of Road
6. Dept. of Mines and Geology
7. Dept. of Hydrology and Meteorology
8. Dept. of Agriculture
9. Dept. of Local Infrastructure Development and Agricultural Road (DOLIDAR)
10. Ministry of Environment, Science and Technology
11. National Agricultural Research Center

Source, Dutta, 2008

10. Conclusions

Watershed territorial units cover a large part of the world's land area. The ultimate target of watershed management is to improve environmental quality and food security.

The major challenges for adopting participatory integrated watershed management lie at the policy formulation level, in information gaps, identifying watershed parameters, integrating the various allocation and inadequate attention paid to grassroots coordination.

These problems can be overcome by good policy, effective implementation and bottom-up approaches, delineating the appropriate size of watersheds to implement watershed management activities and forming community-based organizations to allow for people's participation and promote sound indigenous practices.

Development of a long-term comprehensive policy that is specific to WM and involvement of all stakeholders is necessarily things for the watershed management. Vision, mission and strategic directed policy for the next generation of WM programs will clearly define the scopes and mandates for WM.

Develop a policy that strengthens coordination among relevant sectors and upstream–downstream linkages, so that benefits can be shared. Develop a policy for investing a proportion of the revenue generated from the sale of water resources and services (drinking water, hydropower, irrigation) in WM.

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