

**EFFICACY OF WATERSHED DEVELOPMENT PROGRAMMES
IN KERALA: A GENDER PERSPECTIVE**

By

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(2010-11-139)

THESIS

*Submitted in partial fulfillment of the
requirement for the degree of*

MASTER OF SCIENCE IN AGRICULTURE

Faculty of Agriculture

Kerala Agricultural University

Department of Agricultural Extension

COLLEGE OF HORTICULTURE

VELLANIKKARA, THRISSUR-680 656

KERALA, INDIA

2012

DECLARATION

I hereby declare that this thesis entitled “**Efficacy of watershed development programmes in Kerala: A gender perspective**” is a bonafide record of research done by me during the course of research and that the thesis has not formed of any degree, diploma, fellowship or other similar title, of any other University or Society.

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Acknowledgements

Acknowledgements

*First and foremost I bow my head before **ALMIGHTY** whose blessings enabled me to undertake this venture successfully.*

*I avail this opportunity to express my deep sense of reverence, gratitude and indebtedness to my major advisor **Dr. P. Rajendran**, Professor, RARS, Pattambi and chairperson of my Advisory Committee for his sustained and valuable guidance, constructive suggestions, unfailing patience, friendly approach, constant support and encouragement during the conduct of this research work and preparation of the thesis. I gratefully remember his knowledge and wisdom, which nurtured this research project in right direction without which fulfillment of this endeavor would not have been possible.*

*I place a deep sense of obligation to **F. M. H. Kaseel**, Professor and Head, Department of Agricultural extension, College of Horticulture and member of my Advisory Committee for his unwavering encouragement, unflagging perseverance, well timed support and help rendered which made the successful completion of this thesis.*

*I am deeply indebted to **Dr. Jiju P. Alex**, Associate Professor, Department of Agricultural extension, College of Horticulture and member of my Advisory Committee for his unbounded support, critical comments and valuable suggestions during the preparation of this manuscript.*

*I am very thankful to **Dr. P. Prameela**, Assistant Professor, Department of Agronomy, College of Horticulture and member of my advisory committee for her whole-hearted-co-operation, candid suggestions, encouragement and valuable help rendered during this period of investigation.*

*I am very much obliged to **Dr. S. Bhaskaran**, Professor, Department of Agricultural extension, College of Horticulture, Vellanikkara for his eminent suggestions and corrections. Also for the help that was extended from the beginning of the thesis till the completion.*

*I am very much obliged to **Dr. S. Krishnan**, Professor, Department of Agricultural statistics, College of Horticulture, Vellanikkara for his eminent suggestions and corrections and helping me in developing a new method called parallelism for the study.*

I am especially indebted to my teachers of the Department of Agricultural extension for their unrivalled teaching, kind concern, sincere advices, timely help and support rendered during the investigation and throughout my study period.

*Words cannot really express the true friendship that I relished from **Punya, Yamuna, Sayooj, Sulaja, Aston, Philip, Ranjith and Jeesh** for the heartfelt help, timely suggestions and back-up which gave me enough strength to get through all mind numbing circumstances.*

*I am extremely thankful to **all my batchmates** for their moral support and encouragement.*

*I am deeply indebted to my **Parents and family members** without whose moral support, blessings and affection this would not have been a success. It would be impossible to list out all those who have helped me in one way or another in the successful completion of this work. I once again express my heartfelt thanks to all those who helped me in completing this venture in time.*

Roshini Varghese

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Introduction

Introduction

Indian agriculture is depended on vagaries of monsoon. Nearly three fourth of the cultivable land in India is dependent on monsoon, which is contributing about 42 percent of the total production from agriculture. Crop production mainly depends on two natural resources – land and water in addition to the cultural practices. Therefore, the conservation of these two factors is necessary to sustain the productivity of the rainfed areas. This has been the prime concern of the watershed development programmes and thereby it is gaining its importance over the years.

Watershed development programmes were taken up under different programmes launched by the Government of India. The Drought Prone Area Programme (DPAP) and the Desert Development Programmes (DDP) adopted the watershed approach in 1987. The Integrated Wasteland Development Project (IWDP) schemes taken up by the National Wasteland Development Board in 1989 also aimed at development of the wastelands on a watershed basis. This programme has now brought under the Ministry of Rural Development. The fourth major programme based on watershed concept is the National Watershed Development Programme for Rainfed Areas (NWDPR) under the Ministry of Agriculture.

So far, these programmes have laid their own separate guidelines, norms, funding pattern and technical components based on their respective and specific aims. The DDP focused on the reforestation to arrest the hot and cold deserts, while DPAP concentrated on non arable lands and drainage lines. The IWDP focuses on the silvi-pasture, soil and moisture conservation on wastelands under government and community or private control. The NWDPR combined features of these three programmes and gave an additional dimension of improving the arable land through better crop management technologies. In addition to these programmes, the watershed implementation is also taken up by external funding agencies such as World Bank, Swiss Development Cooperation and internal funding agency like NABARD (National Bank for Agriculture and Rural Development).

While the focuses of these programmes differed, there was a common objective that to conserve the land and water resources for sustainable management. In 1994, a Technical Committee under the Chairmanship of Prof. C.H. Hanumantha Rao, was appointed to assess the Drought Prone Areas Programme (DPAP) and the Desert Development Programme (DDP) with the purpose of identifying weaknesses and suggesting improvements. The Committee, after careful appraisal, opined that the “programmes have been implemented in a fragmented manner by different departments through rigid guidelines without any well-designed plans prepared on watershed basis by involving the inhabitants. Except in a few places, the achievements have been sub-optimal. Ecological degradation has been proceeding unabated in these areas with reduced forest cover, reducing water table and a shortage of drinking water, fuel and fodder” (Hanumantha Rao Committee, 1994)

Against this backdrop, the Committee made a number of recommendations and formulated a set of guidelines that brought the DDP, the DPAP and the IWDP under a single umbrella. The watershed projects taken up by the Ministry of Rural Development (MoRD) from 1994 to 2001 followed these guidelines. In 2000, the Ministry of Agriculture revised its guidelines for its programme *viz.*, the National Watershed Development Project for Rainfed Areas (NWDPA). These guidelines were intended to be common guidelines to make the programme more participatory, sustainable and equitable. However, the MoRD revised the 1994 Hanumantha Rao Committee guidelines in 2001 and yet again in 2003 under the nomenclature “*Hariyali* Guidelines”.

In the meanwhile, emerging issues of ground water recharging and convergence to create a critical mass of investments demanded innovative guidelines. At the advent of the Eleventh Plan period, our main challenge is to move the nation decisively in the direction of "inclusive growth". Rainfed areas of 85 million hectares out of the 142 million hectares of net cultivated area, have suffered neglect in the past. High untapped productivity and income potential exists in these areas.

An insight into the rainfed regions reveals a grim picture of poverty, water scarcity, rapid depletion of ground water table and fragile ecosystems. Land degradation due to soil erosion by wind and water, low rainwater use efficiency, high population

pressure, acute fodder shortage, poor livestock productivity, underinvestment in water use efficiency, lack of assured and remunerative marketing opportunities and poor infrastructure are important concerns of enabling policies. The challenge in rainfed areas, therefore, is to improve rural livelihoods through participatory watershed development with focus on integrated farming systems for enhancing income, productivity and livelihood security in a sustainable manner.

The National Rainfed Area Authority (NRAA) has been set up in November 2006, keeping in mind the need to give a special thrust to these regions. A close analysis of various types of rainfed situations would reveal that soil and water conservation, watershed development and efficient water management are the key to sustainable development of rainfed areas. The watershed approach has been accepted as a major theme for development of rainfed areas with a view to conserving natural resources of water, soil and vegetation by mobilizing social capital. Various studies have pointed out the central focus of watershed development projects with soil and water conservation and relative neglect of issues relating to balanced use of natural resources and livelihoods.

In order to assess the performance of various ongoing projects/ programmes of watershed development, a series of evaluation studies have been conducted by Indian Council of Agricultural Research (ICAR) institutes, State Agriculture Universities (SAUs), National Remote Sensing Agency (NRSA) etc. Impact assessment studies were carried out by the Ministry of Agriculture, Ministry of Rural Development, Planning Commission, ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) and the Technical Committee constituted by the Department of Land Resources (DoLR). These studies support the observation that in several watersheds, the implementation of the programme has been effective for natural resource conservation by increasing the productivity of the land, bringing additional area under agriculture, employment generation and social upliftment of beneficiaries living in the rural areas. But these successes have been sporadic and intermittent. The overall impact at the state and national levels has generally been inadequate.

It is in this context that in coordination with the Planning Commission, an initiative has been taken to formulate “Common Guidelines for Watershed Development

Projects” in order to have a unified perspective by all ministries. These guidelines are therefore applicable to all watershed development projects in all Departments/Ministries of Government of India concerned with Watershed Development Projects.

Out of the total geographical area of the country of 329 MH, about 146 MH is degraded and 85 MH is rainfed arable land. This includes degraded land not only under private ownership, but also the one with the departments of panchayath, revenue and forest. All these lands are prioritized for development under various watershed development projects under these guidelines. During the 11th Five Year Plan, major thrust would be laid on developing the untreated areas.

The Guidelines for Watershed Development issued by the Council for Advancement of Peoples Action and Rural Technology (CAPART), Ministry of Rural Areas and Employment specifies that efforts should be made “to improve the social and economic conditions of the disadvantaged in the watershed community, such as the assetless and the women”. This statement, at the very beginning of the document, establishes a picture of women as a group of ‘helpless and weak individuals’ within the community that require support.

The beneficiaries of the watershed programmes are the people inhabiting in that watershed. They may be directly or indirectly benefited and directly or indirectly involved. As a matter of fact women being almost fifty percent of the total population there is a need to know the perspectives of the women regarding the watershed development programmes as well as their participation are also essential. Many of the barriers make them not to participate in these development programmes or they act passive.

There is a need to know their perspective about the watershed development programmes and their knowledge level regarding it. However, no attempt has been made to study such aspects of these programmes. Hence, the present study was formulated and designed with the following specific objectives:

Objectives of the study

1. To find out the dimensions of watershed development programme at various levels of formulation and implementation and the constraints from a gender perspective.
2. The training needs of the women stakeholders involved in watershed development programmes.
3. To explore the gender issues that are involved in watershed development programmes in Kerala.
4. To suggest various measures for effective gender mainstreaming in watershed development programmes in Kerala.

Scope of the study

The results of the study would help the concerned extension agencies, scientists and policy makers to design extension strategies to extend their infrastructure for higher adoption of recommended watershed practices. It may also help to take appropriate measures to overcome certain practical difficulties in implementation of the watershed development programmes. This can help to tackle the gender issues and issues involved in strengthening organisational linkages, in future, occurring in watershed development programme. It will help to assess the extent of training needed for the stakeholders, especially for women. The study may also help to develop strategies for gender mainstreaming in watershed development programmes.

Limitations of the study

The limitations of time and other resources in the present investigation have restricted the selection of locale, sample size and the variables. Hence, the findings have to be viewed in the specific context of the conditions prevailing in the study area and cannot be generalised for a wider geographical area. However, careful and rigorous procedures have been adopted in carrying out the research as objectively as possible. In spite of the individual bias made by the respondent farmers in eliciting the necessary

responses, it is believed that the findings and conclusions drawn in the present study would focus for more rigorous field observations

Presentation of the study

This report of the study is presented in six chapters.

1. Introduction: about the concepts, importance, objectives, scope and limitation of the study
2. Review of Literature: related to the objective and background of the study
3. Research Methodology: followed to carry out the research systematically
4. Results and Discussion: for the finding of the study
5. Summary and Conclusion for the study
6. References, Appendices and Abstract for the study carried out

Review of Literature

Review of literature

A brief review of previous researches, concepts and information relating to the various dimensions of the present study have been made and presented in this chapter. The review is presented as below under various subsections in accordance with the objectives set for the study.

- 2.1 Concept and importance of watershed development programme
- 2.2 Dimensions of watershed development programmes perceived by the stake holders
- 2.3 Training needs of the women stakeholders
- 2.4 Knowledge level of the stake holders about watershed development programme
- 2.5 Constraints at different stages of watershed development project cycle
- 2.6 Extent of linkage among the different institutions involved in the project
- 2.7 Gender concept, importance and gender issues in the watershed development cycle
- 2.8 Benefits derived from the watershed development programme
- 2.9 Socio-economic characteristics of stake holders

2.1 Concept and Importance of Watershed Development Programme

Watershed definitions:

Sharma and Hooja (1981) stated that the term watershed is an area which has ridge line on three sides and whose surplus run-off is drained from a drainage point. Watersheds could be as small as 50 hectares in hilly areas and as large as 500 to 1000 hectares or even more. The size of watershed to be chosen for land development depends upon the objectives of land development planning.

Government of Karnataka state watershed development cell (1986) defined 'Watershed Development Programme', as system of programme to increase the overall productivity in all identified areas, which is dependent on rainfall and crop productivity is an important component of such programme.

UAS (1988) reviewed in a subject matter workshop-cum-seminar on watershed management; watershed means a geographical area which has a common drainage point. The other names commonly used to designate this geographical quality are catchment and drainage basin water from a few hectares may drain in a small stream, these few hectares will run into a larger one, thus the land areas drained by the small streams make up the watershed for larger one.

Gowda (1992) opined that in the context of development, it is more appropriate to call this programme as 'watershed development programme' (WDP) rather than watershed management programme. It could be defined as an integrated scientific strategy aimed at optimizing land, water and vegetation in all area and thus could provide an answer to mitigate drought, moderate floods, prevent soil erosion improve water availability, increase fuel, fodder, fruits and food production, employment generation and income on a sustained basis.

Oswal (1999) opined that watershed is a natural hydrological entity that covers a specific area, expands of land surface within whose boundaries the entire rainfall run-off ultimately passes through a specifically defined stream. So it is a unit of land on which all water that falls collects by gravity, runs via a common outlet. It is thus an area of land that contributes run-off to a common point and is separated from adjoining areas by a natural elevation ridgeline.

Singh (2000) opined that watershed as a geographic area drained by stream or a system of connecting streams such that all surface runoff originating due to the precipitation in this area leaves the area in a concentrated flow through a single outlet.

Importance of watershed:

Talateren (1975) stated that the comprehensive development of a basin as to make productive use of all its natural resources and also to protect them is termed as 'watershed management'. Further, he said that watershed management includes land improvement, rehabilitation and other technical works as well as human consideration.

ICRISAT (1977) reported that since water is the first limiting natural factor for crop production in arid and semi-arid tracts, improving the management of soil and water for increased crop production becomes the primary aim of the watershed based resource utilization research. In rainfed agriculture, only the rain falls in a given area is used, thus the watershed or catchment is the natural focus for studies of watershed management in relation to crop production, resource conservation and utilization.

Kampen (1979) reported that watershed based resource utilization involves the optimum use of the areas precipitation for the improvement and stabilization of agriculture on the watershed through better water, soil and crop management.

Jaiswal and Singh (1982) stated that in order to obtain maximum benefits from technological developments, it is imperative that the natural resources like soil, vegetation and water were to be properly protected and judiciously utilized to improve the productivity constantly. Watershed is supposed to be the most scientific unit for efficient management of land and water resources as it is basically an agro-climatic unit with relatively more homogeneity of land and other resources compared to the revenue district. The concept of optimum utilization of soil and water on watershed basis has been virtually accepted for the development of drought prone areas.

Bali (1986) preferred to call it as agro-industrial watershed, which is a concept combining two separated approaches for agro-industrial development and watershed management for removal of poverty in India. The focus in the concept is not on the industry or the watershed but it is on the man, who is struggling to extract a living from mostly harsh environment.

Randhawa (1987) emphasized that the improvement and sustainability of agricultural production in the dryland agricultural areas can be achieved through appropriate land shaping, which will optimize the in situ moisture conservation and will also permit the excess water to be managed in a manner, where, it could be stored and utilized as a life saving irrigation and for the adoption of improved production technologies which involves the use of seeds, fertilizers, plant protection chemicals and improved implements.

Sekar (1990) reported that stability in crop production and sustainability of farm income in drylands can be brought about by land treatment, construction of farm ponds, percolation tanks, gully checks, agro-forestry, improved agricultural practices, integrating crop husbandry with animal husbandry and development of dryland agriculture on 'watershed basis'.

Prasad (1994) opined that watershed approach offers an excellent opportunity for all organized and integrated management of drylands. It can facilitate an optimal use of the available resources including soil and water. It can lead to greater diversification of dryland farming which would generate more employment and income earning opportunities and help to reduce mostly the risks inherent in crop centered activity.

2.2 Dimensions of Watershed Development Programmes perceived by the stake holders

CAPART (2001) in the Guidelines for Watershed Development specify that efforts should be made "to improve the social and economic conditions of the disadvantaged in the watershed community, such as the asset less and the women". This statement, at the very beginning of the document, establishes a picture of women as a group of 'helpless and weak individuals' within the community that require support.

GOI (2008) said that the common guidelines for Watershed development projects are based on the following principles:

I. Equity and Gender Sensitivity: Watershed Development Projects should be considered as levers of inclusiveness. Project Implementing Agencies must facilitate the equity processes such as:

- a) enhanced livelihood opportunities for the poor through investment in their assets and improvements in productivity and income,
- b) improving access of the poor, especially women to the benefits,
- c) enhancing role of women in decision-making processes and their representation in the institutional arrangements and
- d) ensuring access to usufruct rights from the common property resources for the resource poor.

II Decentralization: Project management would improve with decentralization, delegation and professionalism. Establishing suitable institutional arrangements within the overall framework of the Panchayati Raj Institutions, and the operational flexibility in norms to suit varying local conditions will enhance decentralisation. Empowered committees with delegation to rationalise the policies, continuity in administrative support and timely release of funds are the other instruments for effective decentralization.

III Facilitating Agencies: Social mobilisation, community organisation, building capacities of communities in planning and implementation, ensuring equity arrangements etc., need intensive facilitation. Competent organisations including voluntary organizations with professional teams having necessary skills and expertise would be selected through a rigorous process and may be provided financial support to perform the above specific functions.

IV. Centrality of Community Participation: Involvement of primary stakeholders is at the centre of planning, budgeting, implementation, and management of watershed projects. Community organizations may be closely associated with and accountable to *Gram Sabhas* in project activities.

V. Capacity Building and Technology Inputs: Considerable stress would be given on capacity building as a crucial component for achieving the desired results. This would be a continuous process enabling functionaries to enhance their knowledge and skills and develop the correct orientation and perspectives thereby becoming more effective in performing their roles and responsibilities. With current trends and advances in information technology and remote sensing, it is possible to acquire detailed information about the various field level characteristics of any area or region. Thus, the endeavour would be to build in strong technology inputs into the new vision of watershed programmes.

VI. Monitoring, Evaluation and Learning: A participatory, outcome and impact-oriented and user-focused Monitoring, Evaluation and Learning system would be put in place to obtain feedback and undertake improvements in planning, project design and implementation.

VII. Organizational Restructuring: Establishing appropriate technical and professional support structures at national, state, district and project levels and developing effective functional partnerships among project authorities, implementing agencies and support organizations would play a vital role.

2.3 Training Needs of the Women Stakeholders

Purushottam *et al.* (2008) found that among six major components of soil and water conservation, four were categorized under most needed and remaining two as needed level of training requirement by farmers. The farmers of Dandewar watershed primarily require training on rainwater harvesting and management (2.98) of harvested water for irrigation, etc. which was followed by improved crop cultivation on terraced (2.96) for higher yields, proper development of common land (2.94) as these were left as barren and finally establishment of orchards (2.84) of temperate fruits most in *rabi* season for their livelihood and higher economic gains. Farmers felt medium level of training need on institution building (2.28) to carry the soil and water conservation activities

which was followed by information on judicious use of drinking water (2.15) for mankind and their cattle. Majority of the respondents (53.3%) hand expressed that training should be practical and problem solving. It was also felt by the farmers (40%) that training should be at watershed level.

Rai (2008) reported that the Crop planning, water conservation technique and irrigation and water management were highly demanded areas for training.

Singh *et al.* (2011) reported that majority of the farmers expressed the need to train them on in situ moisture conservation, selection of specific crops and varieties, pests and disease control etc. According to them, lack of knowledge regarding the watershed activities was the major constraint faced by the beneficiaries of watershed development programme.

2.4 Knowledge of Stakeholders about Watershed Development Programme

Rajkumar (1981) found that most of the beneficiaries of water management scheme possessed medium level of knowledge (76.77%) in soil and water management techniques followed by low (15%) and high (8.33%) level of knowledge.

Jaiswal *et al.* (1985) reported that majority (63%) of the respondents from Vaghnadi and 94 per cent from Umaria watershed of Amreli district had fairly good knowledge about contour bunding, while 67 per cent of the Vaghnadi farmers and 42 per cent from Umaria watershed knew about the use of improved crop variety and cultural practices.

According to Krishnakumar (1987) majority (63.34%) of the respondents had medium level of knowledge, 23.33 per cent had high level of knowledge and 13.33 per cent had low level of knowledge in case of adopter categories of soil conservation practices. In the non adopter category, 66.66 per cent of the respondents had medium level of knowledge, 10 per cent had high level of knowledge and 23.33 per cent of them had low level of knowledge.

Savithri (1992) inferred that 50.67 per cent of farm women had medium level of knowledge on dry land technologies and 30 per cent of them possessed high level followed by low level (19.33%).

Reddy and Iqbal (1993) revealed that a great majority 81.34 per cent of beneficiaries of watershed development programme possessed high knowledge and 70.68 per cent of non beneficiaries possessed low knowledge of soil and moisture conservation measures.

Khedkar and Ingle (1994) in their study revealed that majority (87%) of the farmers had knowledge of some practices viz., brush wood dam to outlet (100%) intercropping (100%), farm pond (100%), *kharif* fallow (95.83%), boundary bunds (92.92%) and sowing across the slope (87.5%), sizeable number of farmers (30%) had knowledge of vetivar bunds, soil amendments, grassed water way, sowing on the contour and surface drains about soil and water conservation practices.

Lakshmi and Manoharan (1994) inferred from their study revealed that most of large farmers (80%) possessed high knowledge about the soil and moisture conservation practices, followed by 63.33 per cent of medium farmers, 43.33 per cent of small and 36.67 per cent of marginal farmers. On the other hand, 56.67 per cent of small and 53.33 per cent of marginal farmers had medium knowledge. Low level of knowledge was observed with 36.67 per cent, 20 per cent of large and 10.00 per cent of marginal farmers about dryland technologies.

Mahipal and Prasad (1995) found that majority of the participants has gained medium level of knowledge in most of the training programmes. However, majority of participants (68.24%) were found in the medium level of knowledge gain in the alternate land use systems training programme. Whereas, the minimum knowledge gain (64.29%) was noticed in the case of crop planning and cropping system under rainfed conditions.

Manjunath *et al.* (1995) revealed that a good number of farmers (53%) belonged to medium knowledge category, while 24.00 and 23.00 per cent of them belonged to high and low knowledge category, in respect of dry farming practices.

Dhanorkar (1998) found extremely low level of knowledge amongst the tribal about watershed practices.

Kadam *et al.* (2001) reported that majority of the beneficiaries had knowledge about the practices namely dividing the fields with small bunds (82.00%) and small earthen bunds (76.66%). More than two-fifth of the beneficiaries had knowledge about the practices namely, stubble and agro waste plucking (46.00%), drains or trenches (43.33%) and intercropping (42.00%).

Sridhar (2002) in his evaluative study of watershed programme in Pavagada taluk of Tumkur district in Karnataka revealed that knowledge about soil and water conservation practices more than 50.00 per cent changes was observed in case of contour bunds (53.94%), ploughing across the slope (58.00%), strengthening of existing bunds (56.66%) and grassed water ways (57.33%).

Raghunandan (2004) reported that about 17.50 per cent of respondents had the complete knowledge of contour cultivation purpose. Majority of respondents possessed the knowledge of reduces soil erosion and conserves soil moisture (62.50%), followed by reduced cost of cultivation (50.00%) and directly improves soil fertility (26.25%). Based on the overall analysis of earlier studies, it could be concluded that there existed by and large medium to high degree of knowledge on soil and water conservation practices among the farmers involved in soil and water conservation schemes.

2.5 Constraints at different Stages of Watershed Development Project Cycle

Naryayanan (1979) in his review of the DPAP work in Kurnool (Andhra Pradesh) observed several weaknesses in the execution of the programme viz., lack of foresight in ensuring wholehearted co-operation of officials at the grass root level, concentration of power at the top, lack of adequate training of the administrators and the farmers, acute shortage of transport facilities.

Reddy (1979), in his review of DPAP in Anantapur district of Andhra Pradesh observed indefinite delays in getting approval of various schemes and appointment of staff as the main hurdles at the initial stage of the implementation of the programme. Similarly, delay in sanction of the estimates and flow of funds for various works led to inordinate delay in making payments, serving facilities and technical guidance were not available in time even for minor repairs. Selection of sites for digging the wells was not proper. There was considerable misuse of cattle, implements and subsidies made available to the weaker sections.

Chowdary and Prasad (1980) indicates in respect of high yielding variety seeds that susceptibility to pests and diseases, non-availability of seeds, high costs and unsuitability of seeds to local conditions were some of the reasons retarding the progress of adoption. Lack of awareness, lack of knowledge and risk aversion attitude of the farmers were additional hurdles. In some cases, inadequate and uncertain supply of inputs also contributed to the failure of the programme.

Bhaskaran and Praveena (1982) examined the working of an Integrated Dryland Agricultural Development Project in Andhra Pradesh. They reported significant differences in the adoption levels between different groups of farmers. The reasons for non-adoption of recommended practices were identified as lack of knowledge about practices, lack of proper guidance and unrealistic nature of the practices recommended. High cost was an additional hurdle.

Sanghi and Rao (1982) emphasized the indifference of the local farmers and lack of participation in the programme as the greatest hurdle in implementation. The farmers were found to revert back to their traditional systems, once the project support was withdrawn from them. Extension services did not keep pace with the requirements of the situations as the project advanced.

In a study, Patel (1983) emphasized the role of active interaction between the supply of technology, the users of technology and the facilitators of technology were essential if new technology had to be successfully implemented. This required

strengthening of input supply mechanism, training of farmers in the optimum use of the inputs and continuous extension services with feedback information.

Chitnis and Bhilegaonkar (1987), in their study of the constraints on adoption of new technology in Skehta, Aurangabad district, Maharashtra, found that the lack of adequate credit, unsatisfactory extension services, inadequate and erratic input supply mechanism, lack of communication between the cultivators and the lower level functionaries and unsatisfactory testing of technology were the main hurdles in the way. The administrative and organizational setup was also found to be weak and fragmented.

Singh and Reddy (1987), in a case study of rainfed castor in Southern Telangana Zone of Andhra Pradesh, found the lack of capital as a serious constraint. Extension services were inadequate and inefficient. Further seeds supply, plant protection chemicals and storage facilities were also found to be inadequate.

Krishnappa *et al.* (1988), in their study on Kabbalanala watershed at Bangalore found piece-meal and partial adoption of new technology as the main reason behind low rate of adoption. Simultaneous adoption of all the components of technology was obstructed by lack of adequate capital and credit in more than one third of the farmers. Agro-climatic conditions of the region accentuated the above difficulties. Scanty and uneven distribution of rainfall and undulating topography, shallow depth of soil, low moisture retention capacity, low fertility of soil, small fragmented nature of holdings and lack of adequate market facilities also came in the way of adoption of new agronomic practices.

Kulkarni and Sangle (1993) examined the constraints in execution of the Phulhaba watershed project activities. The major economic constraints as expressed by farmers were untimely credit, insufficient credit, high rate of interest and rigidity of loan norms. Further, they reported the technical constraints such as percolation of earthen dams, *Khus* plants dry up in summer and fungus developed on it in rainy season. The constraints reported by extension workers were influence of elite farmers for benefits, inadequate transport facilities, lack of financial power and lack of social support.

While evaluating difficulties encountered in the adoption of improved cultivation practices in Manoli watershed (Maharashtra), Ingle (1994) indicated the costly inputs, lack of adequate finance, lack of adequate knowledge of the cultivation practices, and high rate of mortality of forest plants were considered as major constraints. Further, a large majority of the respondents noted the lack of people's participation as an additional hurdle in the project implementation.

Khalache *et al.* (1994) reported the major constraints related to the technical difficulties. They were expressed by the watershed beneficiaries viz., lack of knowledge and skills pertaining to plant protection measures (72.00%), management of dairy cattle (48.00%) and application of chemical fertilizers according to types and stages of crops (45.00%). The foregoing review on the institutional and organizational constraints clearly showed that before the watershed programme was finalized, sufficient attention should be given to the collection of baseline data and a correct appraisal of the needs of the inhabitants of the area proposed to be covered by the watershed should be made. A correct assessment of the scale and scope of environmental problems should be made at the outset. The criteria for evaluating and monitoring should be established so that periodic achievements can be evaluated in the light of the overall project objectives. The participation of the people should be ensured. The administration should be sufficiently decentralized for this purpose. Proper training programmes designed both for the farmers and the extension workers should be organized, infrastructural facilities should receive equal attention, besides input supplies, credit, markets, transport facilities, storage etc., if these precautions were to be taken, most of the hurdles in the implementation of the programme could be overcome and optimum results could be achieved with minimum friction and delays.

Bogale *et al.* (2006) has been observed that absence of clearly defined property right and management plan has led to overexploitation of the hillsides leading to perpetuation of poverty and food insecurity.

Jeet (2007) reported that most of the farmers were perceived as a key factor which affects the working of watershed programme i.e., new generation do not want to work in

agriculture, lack of awareness, poor economic conditions of the farmers, high cost of inputs, officials cannot solve the non-technical problems of the farmers, indifferent behaviour in the administration, lack of guidance, non-availability of staff at the time of farmers need, lack of technical supervision in the operation of occupation and non availability of labour in time were the major constraints which affects the participation and working of farmers in Watershed Development Programme.

Sisodia and Sharma (2008) studied on constraints in People's Participation in Watershed Development Programme reveals that among technical constraints, improved breed of he buffaloes and ram were not provided to the farmers. Trainings were not given under household production system to the masses of backward castes, high mortality of horticultural plants, etc. whereas, among physical constraints, field visits of well established watersheds were not conducted, audio-visual aids were not used and reference material were not provided during training period to the beneficiaries. It was also revealed that watershed beneficiaries were not taken in confidence during budget utilization. Budgetary provision, progress and future plans were not discussed among the beneficiary farmers were the major institutional constraints.

According to Gupta *et al* (2010) majority of the people on the upstream side exhibited a low level of participation while those along the downstream side of watershed area participated more.

2.6 Extent of Linkage among the different Institutions involved in the Project

Wani *et al.* (2008) said that the institutions are mechanisms provided by individuals in the community to resolve social dilemmas and these define and restrict access to and control over resources. In the context of watershed development they are organizational structures evolved in the process and their mutual interaction mechanism. One of the key learning of this participatory large scale programme has been that when people and institutions come together in an enabling environment supported by appropriate institutional arrangements and adequate inputs on a timely ongoing basis it is

possible to generate a developmental dynamic which can result in significant lasting benefits to a large number of people and institutions. As a result of such developments, the new generation of watershed development projects is encountered with multi-stakeholder situations, requiring innovative institutional arrangements to achieve efficiency and sustainability.

Mondal and Singh (2011) observed that the watershed committee (WC), the main functionary of watershed programmes was well structured and ensured representation of various groups/ castes and women in the group in all the projects. The other stakeholder institutions like user groups (UGs), self-help groups (SHGs), etc. were also well integrated into the programmes. However, none of the watershed programmes ensured participation of landless and labourers in programme management whose role were restricted to taking works and getting payments. Gram Panchayath was linked well structurally as well as functionally into the programmes. Other line departments were considered important with medium influence in government managed watersheds and low influence in NGO managed watersheds. Active involvement of various stakeholder institutions in the decision-making process was very low which was evident even in case of NGO implemented projects. The extent of participation of beneficiary households was meagre and limited to certain component of various stages of the programmes. Multinomial logic analysis was carried out to identify different socio-economic, psychological and institutional variables which might affect the participatory decision of the farmer. The findings indicated that the land holding size, age of the household, education, extension contact, etc. were the influential factors.

2.7 Gender Concept, Importance and Gender Issues in the Watershed Development Cycle

Gender definition:

ECOSOC (1997) defined gender mainstreaming as the process of assessing the implications for women and men of any planned action, including legislation, policies or programs, in any area and at all levels. It is a strategy for making the concerns and experiences of women as well as of men an integral part of the design, implementation,

monitoring and evaluation of policies and programs in all political, economic and societal spheres, so that women and men benefit equally, and inequality is not perpetuated. The ultimate goal of mainstreaming is to achieve gender equality.

FAO (1997) defined gender as ‘the relations between men and women, both perceptual and material. Gender is not determined biologically, as a result of sexual characteristics of either women or men, but is constructed socially. It is a central organizing principle of societies, and often governs the processes of production and reproduction, consumption and distribution’. Despite this definition, gender is often misunderstood as being the promotion of women only.

Bravo-Baumann (2000) said as per FAO definition, gender issues focus on women and on the relationship between men and women, their roles, access to and control over resources, division of labour, interests and needs. Gender relations affect household security, family well-being, planning, production and many other aspects of life.

Lidonde *et al.* (2003) opined that gender refers to women’s and men’s different roles, resources, and experiences. Aspects of culture that all of us learn in our own societies as we grow up. Gender roles and resources are different in different societies, and they change over the course of time even within the same societies. Because they are learned, they are open to change. Very often, women’s and men’s roles and resources are not only different, they are also unequal. Whilst there are instances where men are disadvantaged in comparison to women, generally women and girls have fewer opportunities, less access to resources, lower status, and less power and influence than men and boys.

GWA (2006) opined that gender refers to the different roles, rights, and responsibilities of men and women and the relations between them. Gender does not simply refer to women or men, but to the way their qualities, behaviours, and identities are determined through the process of socialization. Gender is generally associated with unequal power and access to choices and resources. The different positions of women and men are influenced by historical, social, religious, economic and cultural realities. These relations and responsibilities can and do change over time. The use of the term gender

also recognizes the intersection of women's experience of discrimination and violation of human rights not only on the basis of their gender but also from other power relations that result from race, ethnicity, caste, class, age, ability/disability, religion, and a multiplicity of other factors.

Importance of gender in watershed:

Carney (1988) opined that although women benefited from the increased economic prosperity of the area, they became more dependent on male heads of households, providing labour for their lands, whereas in the past they had usufruct rights of their own.

Zwarteveen (1994) said that women lost rights to land they had traditionally used to grow food crops for subsistence. Consequently, women were forced to turn to their husbands for cash to buy food and became more dependent on men than they had ever been in the past.

Pangare (1998) opined that in India, women also tried to negotiate informal agreements to solve their irrigation related problems. When water projects made provisions to ensure that "at least one woman" was on water user committees, the effects were minimal and tended towards tokenism. Experience showed that at least one-third and preferably one half the members should be female and women should have specific responsibility and be made signatories to project bank accounts.

She further said that women do sometimes participate in watershed management, for example, undertaking work to reduce soil erosion by maintaining forest cover and reducing the risk of floods and silting of reservoirs and waterways. However, training programmes on the technical and scientific aspects of watershed development are usually aimed at men. Training for women tends to be concentrated on practical issues such as tree planting. Ultimately this means that women do not have the necessary skills, knowledge and confidence to participate in community decision-making and to assume leadership roles in management of watershed development.

Further she concluded that activities undertaken for women in watershed development projects do not empower them to be equal partners with men. There is a need to progress from an attitude where women are treated as a 'disadvantaged group', to a point where they are treated as integral members of the community. Unless women are involved in the decision-making process, watershed development projects will remain welfare oriented as far as women are concerned. A central reason that women remain 'disadvantaged' is because their contribution to the rural economy is not recognised. Since women rarely own or control productive assets, they are not looked upon as decision-makers in the management of natural resources. Consequently, they do not receive their rightful compensation in terms of wages, or in terms of ownership of productive assets and benefits accrued from them.

Whitehead (1998) found that Gambia's Jahaly-Pacharr irrigation project provides a good example of the potentially detrimental effects of irrigation projects on women. With the introduction of irrigation technology, women's resource and access rights declined. They had formerly grown swamp rice in the region but when the irrigation project was set up, their land was re-designated as part of communal or household farms, under the direction of male household heads.

Van Koppen (1998) noted that in the development of irrigation projects, agencies often take on the task of defining local water rights by articulating and formalizing both their own obligations and rights and of those of water users. While ecological or environmental concerns may be part of the decision-making process, these are often overtaken by more instrumentalist, immediate concerns. Most often impact studies are done after water resource decisions have been taken, rather than at the planning, design and construction phase.

Baruah (1999) found that the effect of watershed development projects on women can sometimes be highly negative. In large resettlement projects in India, women have been adversely affected by the breakdown of existing and traditional villages and social units. They often have to leave relatives and friends and sometimes lose touch with adult daughters who have married into nearby villages that will not be displaced. However,

women are seldom provided with compensation. In most cases, adult males, who are considered the heads of family receive monetary compensation and are allocated new land. Thirdly, widowed women and unmarried adult daughters have received fewer or no benefits and deserted women have not been considered at all.

Solanes and Villareal (1999) opined that there may be the occasional need for government intervention to ensure that poor grassroots communities actually participate in water resource decision-making. In South Africa during a public consultation on water legislation, lengthy briefs were submitted by industries but community-based organizations, village-level water committees and NGOs were much less vocal.

FAO (2001) said the ultimate aim of the SEAGA guide is to improve irrigation scheme performance while strengthening the position of rural women and disadvantaged groups.

Adhikari (2001) clearly demonstrated that women due to their interaction with the natural resources have developed vast indigenous knowledge, skill and technology regarding the conservation, protection, use and management of these resources. When we look from gender perspective, the involvement and participation of women in the planning and decision-making forum of community forest programmes were found to be minimal. Community forest management programmes cannot be successful as expected if present trend of women's low participation continues. Therefore, there is a need of mainstreaming gender issues in the overall planning processes of community forestry programmes.

Branco and Almeida (2002) said that in some cases, women are taking the lead in their communities to protect water resources. For example, in north-eastern Brazil, the Rural Women Workers Movement has mobilized women to revitalize a small local river in the water scarce area. This involves community education, i.e. teaching local people not to dump their sewage into the river, in addition to planting native species of trees along the river banks. Women activists are undertaking this project without government support, hoping that if they are able to demonstrate success the government will initiate and support other similar efforts.

Derbyshire (2002) referred gender mainstreaming as an organisational strategy to promote gender equality - depends on the skills, knowledge and commitment of the staff involved in management and implementation. Evaporation of policy commitments to gender sensitivity is widespread. Developing appropriate understanding, commitment and capacity – as well as addressing issues of gender difference and inequality within development organisations themselves is a long-term process of organisational change. Appropriate capacity building activities need to be explicitly included in policy and project documents and frameworks, backed up with staff and budgets, and monitored and reviewed through appropriate indicators of change.

Van Koppen (2002) said that one reason for this lack of congruence between stated intentions and actual practice is that water-related projects usually have strong technical components and are implemented by engineers who rarely have requisite skills and training to integrate gender concerns.

2.8 Benefits derived by the Farmers

Pillai (1978) reported that 95 per cent of the farmers perceived that there was increase in yield in tapioca and coconut after 5 years of completion of soil conservation work. He further reported that 93.33 per cent of the farmers perceived that soil conservation practices resulted in controlling of silting in paddy field and cent per cent perceived that soil conservation measures have effect on conserving soil moisture.

According to Krishnakumar (1987), considerable per cent of the respondents (51.11%) were satisfied with the working of soil conservation schemes. He further stated that most of the respondents had increase in knowledge about agriculture (82.2%), skill in cultivation (74.4%), enhancement in income (70%) and cropping intensity (60%). In case of adoption of soil conservation practices, one-fourth of the respondents experienced heavy loss and difficulty in growing crops. He further reported that the reasons for adoption of soil conservation practices were to get increased yield, to prevent runoff loss of water, to improve soil structure and texture, forced by Agricultural Engineering

Department to adopt contour bunds and to avail loan facilities offered through Agricultural Engineering Department.

Reddy (1987) reported that there was significant increase in the output of most of the crops; an improvement in their standard of living as a result of the watershed programme.

According to Prabhu (1988) the reasons for adoption of soil conservation practices are compelled to adopt, neighbour's adoption, to avail subsidy, to get additional yield, to conserve top soil, to conserve moisture and to ease cultivation operations.

Pagire (1989) in a study on the impact of watershed development observed that almost all the crops cultivated in the area showed an improvement in per ha yield compared to that of the base year (1984-85) at Kolhewaji watershed, Maharashtra. The increase in yield of *kharif* sorghum and wheat was 85 to 134 and 12 to 7 per cent, respectively.

Singh *et al.* (1989) from their study on the socio-economic impact of Kandi watershed and area development project in Punjab concluded that there were significant shifts in land use pattern from uncultivated to cultivated, uncultivable to cultivable area and from unirrigated to irrigated due to the project. The cropping pattern analysis also indicated a slight shift in favour of commercial crops.

Rajput *et al.* (1996) in their study on economic evaluation of watershed programmes in Madhya Pradesh reported that the crop yields were higher in watershed areas compared to non-watershed areas. The yields of soybean, sorghum, wheat and gram were 14.60, 19.60, 16.66 and 14.33 q per ha, respectively, within the watershed compared to 11.00, 14.00, 15.60 and 8.66 q per ha in outside the watershed.

Raghunandan (2004) reported that higher per cent of the respondents had felt that advantages like checks soil and water erosion (56.25%), helps in ground water recharge (47.50%), increases infiltration rate of water (42.50%), increased yield (8.75%) and helps in increasing the cropping intensity (7.50%).

2.9 Socio-Economic characteristics of Farmers

2.9.1 Age

Saikrishna (1998) reported that more than half of the respondents (55.33%) belonged to the group of 35-50 years.

Patil *et al.* (2000) found that the most of the tribal farmers were in age group of 35-45 years.

Madhavareddy (2001) in his study on peoples' participation in watershed development programme implemented by government and non-government organization – A comparative analysis, revealed that equal percentage of respondents (38.30% each) belonged to the middle age category in both government organization and non-government organization watershed. Higher per cent of farmers (38.30%) of Government organization watershed belong to young age category compared to 23.30 per cent of farmers belonging to old age group.

Sridhar (2002) in his evaluative study of watershed programme in Pavagada taluk of Tumkur district in Karnataka found that 44.67 per cent of the respondents were middle aged, while, 28.00 per cent of them were young and remaining 27.33 per cent belong to old age.

Raghunandan (2004) in his study a study on knowledge and adoption level of soil and water conservation practices by farmers in northern Karnataka reported that 45.00 per cent of the respondents (45.33%) belonged to the middle age group, followed by old age (36.25%) and young age group (18.75%), respectively.

2.9.2 Education

Marilingannavar and Manjunath (1992) reported that majority of the respondents (76.00%) were found to be illiterate. Whereas, only 17.33 per cent of them had education

upto primary school and 5.33 per cent of them could just read and write, while, negligible (0.67%) of the respondents had education upto high school and college level.

Gupta (1999) found that 43.34 per cent of the respondents were educated upto middle school, followed by 19.33 per cent each in primary school and high school, whereas only 0.67 per cent of them were graduates.

Sridhar (2002) found that 26.67 per cent of the respondents were educated upto high school, 24.66 per cent upto middle school, 12.67 per cent upto primary school, 12.00 per cent could read and write, 11.33 per cent had collegiate education. The percentage of illiterates was 12.67.

Raghunandan (2004) revealed that majority (73.75%) of the respondents are literates of which 22.50 per cent studied upto primary school. 20.00 per cent studied middle school, 15.00 per cent respondents upto high school, 11.25 per cent of respondents upto preuniversity, whereas, 5 per cent respondents had graduation, whereas, 23.28 per cent of the respondents were illiterate.

2.9.3. Land holding

Ramchand and Sohal (1985) reported that 15 per cent of the farmers had large land holding, whereas 42.00 per cent each had medium and small land holding.

Naik (1993) found that 40.00 per cent of the respondents had big land holding, followed by small landholders (30.00%) and marginal landholders (26.00%).

Nagaraj (1996) reported that 48 per cent of the participant farmers belong to medium land holding category, followed by 30.67 per cent in small landholding category, only 8 per cent of them were big farmers.

Madhavareddy (2001) reported that 35.00 per cent of the respondents were marginal farmers, 26.60 per cent were small farmers and 21.80 per cent were medium farmers.

2.9.4. Annual income

Narasimha (1980) reported that 68 per cent of trained farmers had low income level.

Purushotham *et al.* (1988) reported that 62 per cent of the respondents belonged to low income group, 24.00 per cent to middle income group and 14.00 per cent to high income group.

Nagaraj (1996) revealed that 44.00 per cent of participant farmers had income between Rs. 5,000 and Rs. 10,000, while, 25.00 per cent of them had income of more than Rs. 10,000 annually.

Sridhar (2002) reported that 43.00 per cent of the respondents belonged to income group of Rs. 11,001 to Rs. 22,000 per annum, whereas only few of them (6.6%) belonged to higher income group of Rs. 22,001 to Rs. 33,000.

Research Methodology

Research Methodology

The study was conducted during 2011-2012 in two districts of Kerala viz., Thrissur and Palakka. The description of the methods and procedure followed in conducting the research is furnished under the following subheadings.

3.1 Research design

3.2 Locale of the study

3.3 Sampling procedure

3.4 Brief description of the study area

3.5 Selection of variables

3.6 Operationalisation and measurement of variables

3.7 Tools used for data collection

3.8 Statistical methods used to analyse the data.

3.1 RESEARCH DESIGN

The objectives of the study warrant the necessity of selecting *Ex-post-facto* research design. Selecting the research design as the phenomena has already occurred.

3.2 LOCALE OF THE STUDY

The study was conducted in two panchayaths Wadakkanchery and Akathethrara of Thrissur and Palakkad respectively. The Thrissur and Palakkad districts were selected taking the scarcity prone districts of Kerala state. The study locale was randomly selected from two districts based on the fact that Watershed project were initiated during the year

2006-2007 in a phased manner but still continuing under the aegis of local bodies. In addition to that, the Akathethara panchayath has got the “Green Kerala Express” award and they are pioneering in the watershed activities. Further, familiarities of the student researcher with prevailing conditions of these areas were also taken into account for selecting this area for the study.

3.3 SAMPLING PROCEDURE

Purposive random sampling procedure was followed to select respondents in the study area. Thrissur and Palakkad district was purposively selected because the program was already implemented in these districts since these areas comparatively suffer water scarcity. Most of cultivated areas are under rainfed farming, the poor utilization available natural resource, the labour deficit and soil erosion were the problems found in these areas. Hence, more efforts were required to bring changes in the above conditions. Two panchayaths were randomly selected based on the implementing agency for the comparative study. Further, 15 men and 15 women from the both panchayath were randomly selected from the user groups and the self help groups. Fifteen implementing officers were also randomly selected from each of the panchayaths for assessing the constraints of the watershed development programme. Thus, 90 respondents constituted the sample size.

3.4 DESCRIPTION OF THE STUDY AREA

Wadakkanchery panchayath

Wadakkanchery panchayath of Thrissur district lies between 10.65° latitude and 76.25° longitude and at an average elevation of 37 meters above the mean sea level. The panchayath is bound on the north-east by Mullurkkara panchayath, on the north-west by Erumapetty panchayath, south-east by Thekkumkara panchayath and south-west by Mundathicode panchayath. The Wadakkanchery panchayath has 19 wards.

Fig 1: Map showing study area of Thrissur district: Wadakkanchery panchayath

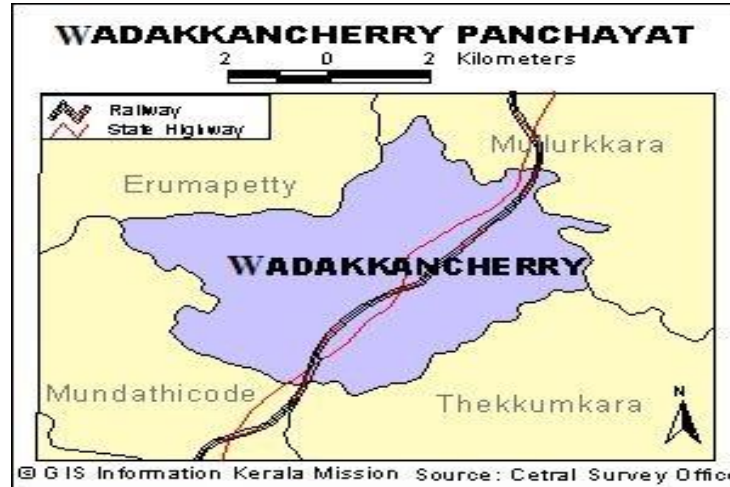


Table 1. Demographical features of Wadakkanchery panchayath

District	Thrissur
Block	Wadakkanchery
Area	28.52 sq. Km
LSG code	G080309
Number of wards	19
Population	28692
Male	13759
Female	14933
Population density	1006
Female:male(sex ratio)	1085
Literacy	87.17
Literacy(male)	91.97
Literacy(female)	82.82

Akathethara panchayath

Akathethara panchayath of Palakkad district lies between 10.78° latitude and 76.63° longitude and at an average elevation of 75–250 meters above the mean sea level. The panchayath is bound on the north-east by Malampuzha panchayath, on the north-

west by Puthuperiyaram panchayath and south by the Palakkad municipality. The Akathethara panchayath has 17 wards.

Fig 2.: Map showing study area of Palakkad district: Akathethara panchayath



Table 2. Demographical features of Akathethara panchayath

District	Palakkad
Block	Malampuzha
Area	23km sq.
LSG code	G091301
Number of wards	17
Population	21514
Male	10664
Female	10850
Population density	935
Female:male(sex ratio)	1017
Literacy	86.61
Literacy(male)	92.52
Literacy(female)	80.83

3.5 SELECTION OF VARIABLES

3.5.1 Dependent variables

In the light of objectives set for the study, the dependent variables considered were:

1. Dimensions perceived by the stake holders
2. Training needs of the women stakeholders
3. Knowledge level of the women stake holders
4. Extent of linkage among the different institutions involved in the project

Along with that field observations were also taken for the study regarding the constraints, gender issues and benefits of the programme as perceived by stakeholders.

3.5.2 Independent variables

Based on the review of literature and discussion with the scientists of KAU, Thrissur and Extension functionaries of the Department of Agriculture, the independent variables were selected for the study. Out of 11 variables identified for the study (Appendix II) the variables were selected based on the importance of direct relationship with the dependent variable for the study. The scale of continuum of most important, important, less important and not relevant was given to rate the by the judges against each independent variable. Based on the scores 3 and above 3 were selected as variables for the study as given below.

1. Age
2. Education
3. Land holding
4. Annual income

3.6 OPERATIONALIZATION AND MEASUREMENT OF VARIABLES

3.6.1 Dependent variables

3.6.1.1 Dimensions perceived by the stake holders

It is operationalised as the various activities under planning, implementation and withdrawal and follow-up phase of the watershed development programmes taking the stakeholders perception on each activities and their importance as far as each phase is concerned under WDP programme. The dimensions of the various phases perceived by the respondents were measured by a score for each activities based on the importance in the order most important as 3, important as 2 and least important as 1. On the basis of importance, scores 2 and above, of the activity or dimension were selected

3.6.1.2. Training needs of the women stakeholders

The training needs of the stake holders are operationalised as the activities of the watershed development programmes where the training need is felt by the stake holders. In order to identify the area of training needs, 20 different training areas were listed. A four point continuum was used and scores were assigned as 3, 2, 1 and 0 for most needed, more needed, needed and not needed respectively. On the basis of score value 2 and above different training need areas were identified.

3.6.1.3. Knowledge level of farmers about watershed development programme

In the present study the knowledge level of farmers about watershed development programme is operationalised as the meaning and usefulness of the features as factual information possessed by the stakeholders.

Construction of the knowledge test

Twenty questions were formulated based on the context, dimension, procedure and other relevant factors of the WDP. The teacher made test procedure was followed by scoring one point for every right answer. The knowledge level was classified based on the score range from 1 to 20 as below.

Table 3. scale for classifying Knowledge level of stakeholders

Sl no.	Score	Knowledge level Classification
1	Less than five (<5)	Low
2	Five to ten (5-10)	Medium
3	Ten to fifteen (10-15)	High
4	Fifteen to twenty(15-20)	Very high

3.6.1.4. Extent of linkage among the different institutions involved in the project

It is operationalised as the importance perceived by each stakeholder on each institution, which perform their roles and active participation extended to the watershed programme. For the importance perceived by the respondents were measured by assigning score to each institution based on the importance perceived by the stakeholders on each institution in the continuum *viz.* highly essential as (3), essential as (2), least essential as (1) and not essential as (0). The total score obtained by each institution was ranked.

3.6.1.5. Constraints at different stages of watershed development project cycle

The constraints are operationalised as the reasons that severely restrict the scope/extent/activity of the watershed development programmes at the different phases of the project cycle as perceived by the stake holders and the implementing officers. In order to find out the constraints, 36 constraints were stated and response were taken either 'yes' (constraint existed) or 'no' (no constraint). On the basis of frequency of 'yes' by the respondents, the constraints were ranked and grouped.

3.6.1.6. Benefits derived from the watershed development programme

It is operationalised as the increase or decrease or no changes in the particular result of the watershed development programme as perceived by the stakeholders. This was done by exposing some of the expected results of the watershed development

programme to the respondents and they were asked to rate them as “decreased”, “increased” or “no change”. Based on this frequency and percentages were calculated.

3.6.1.7 Gender issues involved in the watershed development programme project cycle

Gender issues are operationalised as the issues that occur at the different stages of the watershed development programme project cycle that restrict the active participation of both the gender in the equity promoting watershed development programme. This was done by an open ended question to the respondents, so as to explore the maximum issues. These issues were grouped and listed as per their homogeneity clusters.

3.6.2 Independent variables

3.6.2.1. Age

It is conceptualised as the chronological age of the respondents in completed years at the time of investigation. The respondents were further categorized into three groups as per GOI norms as follows young (<35 years), middle age (35-45 years) and aged (>45 years).

3.6.2.2. Education

It is operationalised as the number of years completed formal education successfully by the respondent. For each year of schooling, a score was given. The respondents were grouped into different categories based on the level of education as, “Illiterate (Cannot read and write)”, “Upto high school”, “High school” and “College”. The procedure followed by Hiremath (2000) was used.

3.6.2.3. Land holding

The land holding is conceptualised as the total area of land possessed by an individual. Garden land and wet land was considered. The standard classification by the Land Records Information Systems Division, National Informatics Centre, Government of India is adopted for size of holding (Farmer Category) with digital coding scheme is

used in this survey. Accordingly, the farmers were classified into the following groups, “Large Farmer (>5ha)”, “Medium Farmer (>2 ha and \geq 5 ha) and “Small Farmer/Marginal Farmer \leq 2ha”.

3.6.2.4. Annual income

It was measured in Indian Rupees by taking the total income of the family from all the sources in a year. The classification as suggested by Ministry of Rural Development, Government of India (GOI, 1998) and as followed by Hiremath (2000) was followed. The income level is classified as, “Low (Rs. 6,000- Rs.19, 000)”, “Medium (Rs.19,000- Rs.32,000)”, and “High (Rs.32,000- Rs.45,000)” per year.

3.6.3. Suggestions for effective gender mainstreaming in watershed development programme

These are the ideas put forth by the respondents based on their experience. Suggestions of the stakeholders and implementing officers were sought through open ended questions. Based on the results of the study, suggestions from experts were also listed.

3.7 TOOLS USED FOR DATA COLLECTION

Keeping in view the objectives and variables under study, a structured interview schedule was prepared by reviewing the previous research studies, consultation and discussion with the experts and professionals in the field of agricultural extension. The interview schedule was pre-tested in a non-sample area and validated in the pilot study. Care was taken to avoid ambiguity. The final interview schedule was prepared by necessary modifications, additions and deletions based on pre-tested results. The final format of the interview schedule is furnished in Appendix III. The data was collected from stakeholders of Watershed Development Programme in an informal atmosphere by personal interview method.

3.8 STATISTICAL METHODS USED TO ANALYSE THE DATA

The data collected were entered in excel sheet and the following statistical tests were administered to interpret the results. The data collected from the respondents were scored, tabulated and analysed by using suitable statistical methods.

1. Simple correlation to find out the relationship of independent variable and the dependent variables
2. “t-test” to compare the differences in the level of knowledge of men and women
3. Parallelism, a new methodology was used explain the integration and linkage of various institutions.
4. Apart from these, frequency and percentage analysis were done to interpret the results

SPSS package was used to analyse the data and administered the statistical analysis.

Results and Discussion

Results and Discussion

This chapter presents the results emerged out of the study. The discussion has been taken up simultaneously along with the results. The results of the study have been presented in the following sections in the light of the objectives set- forth.

- 4.1. Dimensions perceived by the stakeholders of the WDP
- 4.2. Training needs of the women stake holders
- 4.3. Knowledge level of the women stakeholders
- 4.4. Benefits derived from the WDP
- 4.5. Extent of linkages of the institutions in the WDP
- 4.6. Constraints faced at different stages of the WDP
- 4.7. Gender issues involved in the WDP
- 4.8 Profile characteristics of watershed development programme stakeholders
- 4.9 Suggestions for effective gender mainstreaming in the WDP

4.1. Dimensions of WDP perceived by the stakeholders

A. WDP stakeholders' perception on various dimensions in planning phase

The result is presented separately for two panchayaths and for both gender.

The perception of the stakeholders of the WDP in the Wadakkanchery panchayath from Table 4 revealed that out of the fourteen dimensions, five dimensions *viz.* 'baseline survey', 'basic information collection', 'detailed mapping exercise by PRA', 'expected outcomes' and 'description of proposed interventions' were the rank order of perceptual preferences of the stakeholders.

Table 4: DIMENSIONS PERCEIVED BY STAKEHOLDERS IN THE PLANNING PHASE

(N = 60)

Sl. No.	WADAKKANCHERY		AKATHETHARA		MEN STAKEHOLDERS		WOMEN STAKEHOLDERS	
	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE
1	Baseline survey	90	Baseline survey	90	Baseline surveys	90	Baseline survey	90
2	Basic information collection	90	Basic information collection	90	Basic information collection	90	Basic information collection	90
3	Detailed mapping exercise by PRA	90	Detailed mapping exercise by PRA	90	Detailed mapping exercise by PRA	90	Detailed mapping exercise by PRA	90
4	Expected outcomes	69	Initiating development of village level institutions (UG/SHG/WC)	76	Initiating village level institutions(UG/SHG/WC)	65	Expected outcome	67
5	Description of proposed interventions	60	Productivity enhancement measures	63	Productivity enhancement measures	64	Description of proposed interventions	60
6			Expected outcome	61	Expected outcome	63		
7			Environment building, awareness generation	60	Description of proposed interventions	60		
8			Description of proposed interventions	60				

*PRA: Participatory Rural Appraisal

The Table 4 revealed the perceptual preferences of dimensions of WDP in Akathethara panchayath. Out of fourteen dimensions all the five dimensions perceived by the Wadakkanchery panchayath were expressed by the Akathethara panchayath respondents. Apart from these, the dimensions *viz.* ‘productivity enhancement measures’, and ‘environment building, awareness generation’ were also perceived additionally.

Hence, the results consistently confirmed that five dimensions out of fourteen dimensions identified were perceived by both the panchayath, and Akathethara panchayath alone has perceived two dimensions additionally.

Viewing the Table 4, it indicated that seven dimensions out of fourteen was perceived by the male stakeholders such as ‘baseline survey’, ‘basic information collection’, ‘detailed mapping exercise by PRA’, ‘initiating the village level institutions (UG/SHG/WC)’, ‘productivity enhancement measures’, ‘expected outcome’ and ‘description of proposed area’ in that order of preference.

The dimensions perceived by the women stake holders vide Table 4 shows that out of the fourteen dimensions, only five were perceived by them *viz.* ‘baseline survey’, ‘basic information collection’, ‘detailed mapping exercise’, ‘expected outcome’ and ‘description of proposed area’, confirming the importance of the five in consistency with their counterpart.

The results of dimensions perceived by stakeholders under Planning Phase revealed that out of fourteen dimensions, five dimensions like ‘base line survey’, ‘basic information collection’, ‘detailed mapping exercise by PRA’, ‘expected outcome’, and ‘description of proposed interventions’ were the common dimensions under panchayath wise and gender wise perception. This could be well explained that during Planning Phase, the basic details and ground level realities need to be accurate for quantifying the impacts in future and fix the standard yard stick to be projected based on the existing situation. Above all, existing basic information alone would give proper guidelines to develop programs of programme objectives for the watershed development programme. Hence may be the reasons for consistence perception of the aforesaid dimensions. Akathethara panchayath perceived additionally the ‘productivity enhancement measures’,

‘environment building’, ‘awareness generation’ and ‘initiating village level institutions’ dimensions because, the local self government institution is the implementing agency of the watershed development programme, and as a result the people involvement was more in planning phase. Hence they might have perceived additionally the above dimensions additionally.

B. Dimensions perceived by WDP stakeholders in the implementing phase

This is presented separately for two panchayath and both gender.

The Table 5, revealed that out of ten dimensions identified, the stakeholders perceived only three dimensions as the most important dimensions under the implementation phase, such as ‘ridge area treatment’, ‘drainage line treatment’ and ‘development of water harvesting structures’ with equal preference.

It is clear from Table 5 that the stakeholders of the Akathethara panchayath perceived five dimensions under the implementation phase. The three dimensions perceived by the Wadakkanchery panchayath were consistently perceived by the Akathethara panchayath. The dimensions like the ‘land development measures’ and ‘development of the CPR’ additionally were perceived by the Akathethara panchayath stakeholders.

The analysis of the perception of gender regarding the dimensions under the implementation phase was done separately and the result is presented in Table 5. As the preference of male and female stakeholders are one and the same with almost equal preferential scores and rank order, the result further confirms the findings firmly. The dimensions perceived were the ‘ridge area treatment’, ‘drainage line treatment’, ‘development of water harvesting structures’ and ‘land development measures’.

The results of perception of dimensions under implementing phase revealed that both panchayath level and gender level, only three dimensions, viz. ‘ridge area treatment’, ‘drainage line treatment’ and ‘development of water harvesting structures’ were

Table 5: DIMENSIONS PERCEIVED BY STAKEHOLDERS IN THE IMPLEMENTING PHASE

(N = 60)

Sl. No.	WADAKKANCHERY		AKATHETHARA		MEN STAKEHOLDERS		WOMEN STAKEHOLDERS	
	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE
1	Ridge area treatment	90	Ridge area treatment	90	Ridge area treatment	90	Ridge area treatment	90
2	Drainage line treatment	90	Drainage line treatment	90	Drainage line treatment	90	Drainage line treatment	90
3	Development of water harvesting structures	90	Development of water harvesting structures	90	Development of water harvesting structures	90	Development of water harvesting structures	90
4			Land development measures	90	Land development measures	72	Land development measures	72
5			Development of CPR	60	Development of CPR	60	Development of CPR	60

*CPR: common property resources

Table 6: DIMENSIONS PERCEIVED BY STAKEHOLDERS IN THE WITHDRAWAL AND FOLLOW-UP PHASE

(N = 60)

Sl. No.	WADAKKANCHERY		AKATHETHARA		MEN STAKEHOLDERS		WOMEN STAKEHOLDERS	
	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE	DIMENSION	SCORE
1	Maintenance of assets created	90	Maintenance of assets created	90	Maintenance of assets created	90	Maintenance of assets created	90
2	Involvement of panchayath in maintenance	90	Involvement of panchayath in maintenance	90	Involvement of panchayath in maintenance	90	Involvement of panchayath in maintenance	90
3	Evaluation of the project	60	Evaluation of the project	60	Evaluation of the project	60	Evaluation of the project	60

perceived consistently by all the four categories. This might be due to the reason that these activities are basic and fundamental works under the WDP so as to conserve the water resources and increase the water holding capacity of that area. Hence the perceptions about the dimensions were uniform and consistent. The ‘land development measures’ was another dimensions perceived by all the categories except Wadakkanchery. This may be due to the reason that land development is the mutual and complimentary function of WDP that would pave way for WDP as well as WDP would enhance land development.

C. Dimensions perceived by WDP stakeholders in the withdrawal and follow up phase

The results of the perception of the stake holders regarding the dimensions of WDP under the different panchayath and gender wise analysis is given below.

The dimensions under the withdrawal and follow up phase of the Wadakkanchery and Akathethara panchayath in Table 6 revealed that out of six dimensions, only three dimensions namely ‘maintenance of assets created’, ‘involvement of panchayath’ and ‘evaluation of the project’ were equally and consistently preferred by both the panchayath stakeholders.

Further, the gender analysis also revealed the perceptual preference of the same dimensions with the same order of preference. This further confirms the aforesaid findings of the study.

The dimension perceived by four categories under the withdrawal and follow up phase were ‘maintenance of the assets created’, ‘involvement of panchayath in maintenance’ and ‘evaluation of the project’. It is the basic and material phenomena that in any project or programme eventually tried to project what was achieved, to what extent the programme was successful and their related consequences as impact to the society. This could be achieved or assessed only when there is a provision for evaluation. Assets or material possession created due to programme and the follow-up activities like the continuous involvements implementing agency is also essential. This is true in the case of WDP prepare as its objective mainly envisages the asset development, impact analysis and follow-up activity by the institution. Hence may be the results.

4.2. Training needs of the women stake holders

The training programs, opportunities for study (non-formal classes) and exposure visits so as to broaden their horizons and improve their skills, are beneficial for women and also serve the purpose of socialisation and relaxation.

4.2.1. Training needs of women stake holders

Table 7. Training needs of the women stake holders (N=30)

Sl. No.	Area of training	Scores
1	Soil and water conservation	90
	a. Drainage line treatment	90
	b. Water harvesting structures	90
	c. Ridge area treatment	90
	d. Land development	90
2	Crop cultivation practices	
	a. Cropping sequence	90
	d. Manures and fertilizers	90
	e. Plant protection	90
	g. Intercropping	90
3	Water harvesting techniques	Not aware of the practices so no perception
	a. In-situ water conservation	
	b. Ex-situ water conservation	
	c. Roof water harvesting	
4	Land capability and crop planning	Not aware of the practices so no perception
	a. Soil characteristics and types	
	b. Crop selection by land capability	
5	Livelihood generation	
	a. Poultry	90
	b. Livestock	90
	c. Employment programmes	90

The training need assessment of women stake holders revealed (Table 7) that out of five major areas ‘soil and water conservation measures’, ‘crop cultivation practices’, ‘water harvesting techniques’, ‘land capability and crop planning’ and ‘livelihood generation’, only three major areas were perceived most important for imparting training.

The major areas like ‘water harvesting techniques’ and ‘land capability and crop planning’ were not exposed to farmers and they were not aware of these techniques. Singh *et al.* (2011) also reported the same training need by the stakeholders.

Under the ‘livelihood generation’, the learning components like ‘poultry rearing’, ‘livestock rearing’ and ‘employment generation programme’ were the most needed training areas of the stakeholders.

The training need analysis revealed that the training components under major area ‘soil and water conservation’, such as the ‘drainage line treatment’, ‘water harvesting structures’, ‘ridge area treatment’ and ‘land development’ as the major perceived training components by the respondents. Similar requirement was reported by Rai (2008). This result confirms that the perception of dimension under training phase was one and the same. Naturally the farmers would perceive these areas important for imparting training so as to have complete knowledge about this dimension.

In the ‘crop cultivation area’, training components like ‘cropping sequence’, ‘manures and fertilisers’, ‘plant protection’ and ‘intercropping’ were perceived as important training components. This may be due to the reason that, the perceived training components were highly skill and technique involved practices as far as farmers are concerned. The ‘cropping sequence’, ‘manures and fertilisers’, ‘plant protection’ and ‘intercropping areas’ required the “know-how” and “how to do” aspects. Hence may be the reason for the preference.

In ‘livelihood generation’ the training components like ‘poultry rearing’, ‘livestock rearing’ and ‘employment programmes’ were perceived as important areas because, livestock is the only area where land availability is not a limitation, and could be reared in the homestead itself and since it requires technical skill and “know how”, they might have perceived it as important training component.

The major areas like ‘water harvesting technique’ and ‘land capability and crop planning’ were not exposed to farmers and were not aware of that dimension also. These dimensions are highly advanced, highly skill oriented and high competency is required. More over the farmer were not aware of these dimensions. Hence, the training is must on these areas and systematic training must be imparted.

4.2.2. Training needs of women Vs. men stake holders

Table 8: Training needs of women Vs. men

(N=60)

Gender	Mean	t value
Male	9.9333	0.302 NS
Female	10.1333	

NS: not significant

The t-test of statistical analysis of the training needs of the women and men shows no significant difference. Hence, it is inferred that the training needs perceived by male and female stakeholders were the one and the same areas of training components identified under WDP. However, the training components identified under the WDP are slightly greater for women stakeholders.

Both men and women are involved in the cultivation practices as well as the watershed development programmes. Men and women had more knowledge about the watershed development programme, so they were becoming aware about the importance of the programme and various aspects of training needed. As they get more training they will be equipped to undertake activities by their own. Moreover, in the scenario like Akathethara panchayath, where the implementing agency is local self government institution, the people residing in the area, of both genders , must know the importance of training of major areas of training found.

4.2.3. Training needs of women and the socio economic attributes

Table 9. Training needs of women with the socio economic attributes

(N=30)

Socio-economic characteristics	r value
Age	-.005 NS
Education	-.332 NS
Land holding	.308 NS
Income	.015 NS

NS: not significant

The four quantitative variables namely age, education, land holding and the income level of the stakeholders were correlated with their training needs. The tests revealed that out of the four variables only education was found to be significant and negatively correlated at 5 per cent level of probability.

Hence, it is inferred that the education is negatively influencing the training needs. Lower the educational level of the farmers, greater will be their training needs. As people were having low educational level there is an additional effort required for training. Since they are not aware about the majority of the aspects of the WDP, it is essential that they should be imparted training on soil and water conservation, water harvesting techniques etc.

The result could be explained that women stakeholders have low educational level and required to acquire more knowledge and skill aspects of 'soil and water conservation' and 'water harvesting techniques'. Separate and concerted effort should be taken to scheme the training programme especially for women clients with respect to venue, duration, time of training, topics and even training methodology intended for women stakeholders.

4.3. Knowledge level of the women stakeholders

4.3.1 Knowledge level of the women stakeholders

The knowledge level of women stakeholders is presented in Table 10. The stakeholders were given 20 questions to answer. Each correct answer was given a score. Based on the score for the correctness answer they were grouped as below. This is done for the knowledge level of the stakeholders about the watershed development programme. This was done to know to what extent they know about the development programme. Since watershed development programme stress on the participatory approach, there is a need to know how far the people are becoming aware of.

Table 10. Knowledge level of the women stakeholders

(N=30)

Sl. No.	Knowledge level	Percentage
1	Low	0
2	Medium	0
3	High	23
4	Very high	77

The study (Table 10) revealed that the women respondents have high to very high level of knowledge about WDP (Reddy and Iqbal (1993) and Lakshmi and Manoharan (1994)).

The women stakeholders are having more knowledge of about the watershed developmental programme. As the women were attending the public meetings conducted by the officials explaining preliminary information about the watershed development programme they had more knowledge about the watershed development programme. The knowledge level analysis is crucial, because based on the knowledge level we can plan the training needs.

4.3.2. Knowledge level of men vs. women

Table 11. Knowledge level of men vs. women

(N=60)

Gender	Mean	t value
Men	17.100	1.699 NS
Women	16.300	

NS: not significant

The Table 11 revealed that the knowledge level of the women and men do not differ significantly. Hence it is inferred that the knowledge level of the male and female stakeholders about the WDP were almost similar.

These results could be explained that men and women respondents of both the panchayath were having knowledge about WDP due to high involvement in the meeting and programmes conducted by the institutions. Hence may be the result.

4.3.3. Relationship of profile characteristics with knowledge level of the women stakeholders.

Table 12. Knowledge level of women with the socio economic attributes

(N=30)

Socio-economic characteristics	r-value
Age	-.276 NS
Education	-.179 NS
Land	.108 NS
Income	-.268 NS

NS: not significant

The four socio-economic variables namely age, education, land holding and the income level of the stakeholders had no relationship with knowledge of the stakeholders.

This could be explained with the reason that as the knowledge level of stakeholders were very high; it is not varying but acting as constant factor. Hence may be the reason for non-significance relationship with socio-economic characteristics of stakeholders.

4.4. Benefits derived from the watershed development programme:

The analysis indicated (Table 13) that cent per cent ‘employment’ increase in Wadakkanchery followed by increase in ‘participation’ (56.57%) and ‘water level’ (50%) and ‘crop yield’ (46.67%). Whereas 60 per cent of the people perceived that ‘water scarcity’ is decreased, and cent per cent perceived that ‘soil erosion’ was decreased. Similar benefits were indicated in the study by Krishnakumar (1987) and Raghunandan (2004).

As far as Akathethara panchayath is concerned, cent per cent perceived an increase in ‘crop intensity’ and ‘employment’ followed by increase in ‘participation’ and ‘standard of living’ (both 83.33%). Similar benefit was reported by Reddy (1987). There was an increase in ‘water level’ (70%), ‘crop yield’ (63.33%) and ‘income’ (50%). Cent per cent perceived that the ‘flooding’, ‘soil erosion’ and ‘water scarcity’ were reduced.

The cropping intensity has an increase in the Akathethara panchayath compared to the Wadakkanchery panchayath, since the beginning of the watershed development project they were cultivating *Coleus* as an additional crop. More over due to the interventions like rain pits in the private land, the yield of coconut was increased.

In rain-fed agricultural rural areas, except for a few months, work opportunities are very less. In fact, during the agricultural season too, especially in drought prone areas, the entire demand for work cannot be met in the village itself. Hence poor peasants and agricultural labourers have to go to towns or distant villages in search of work (e.g. construction sites, sugarcane cutting, digging of wells, brick kilns etc.). With wage supported watershed activities starting in the watershed, the people, especially women, avail of this opportunity to enhance the family income. Hence the employment status was

perceived as increased. The labour force required by the watershed development programme has been provided by the NREGA scheme, and this has led to the increase in the job opportunities for the people. So many programmes were integrated with the watershed development programme that helps the people to earn more. Most of the women groups take up those works and thus their income increased. Since people are more attracted to the programmes that help them to earn more, their participation will also be high in that. In a way it can contribute to the success of the programme.

Table 13: Benefits of the WDP as perceived by the stakeholders

(N=60)

BENEFITS	WADAKKANCHERY			AKATHETHARA		
	Increase	No change	Decrease	Increase	No change	Decrease
Income	2 (6.67)	28(93.33)		15(50)	15(50)	
Education		30(100)			30(100)	
Water level	15(50)	15(50)		21(70)	9(30)	
Water scarcity		12(40)	18(60)		11(36.67)	19(63.33)
Participation	17(56.57)	13(43.33)		25(83.33)	5(16.67)	
Irrigation		30(100)			30(100)	
Soil erosion			30(100)			30(100)
Crop intensity		30(100)		30(100)		
Crop yield	14(46.67)	16(53.33)		19(63.33)	11(36.67)	
Standard of living		30(100)		25(83.33)	5(16.67)	
Employment	30(100)			30(100)		
Flood						30(100)

Income generation is a crucial aspect in impact analysis. When women were motivated to form savings and credit groups, the money earned from wages and other activities can easily be used to generate initial funds for internal lending and utilization. This was not only making credit on demand available at reasonable rates, but also strengthens the bonds among the women in the village which empowers and gives societal status.

Attempts will have to be made so that women have access to sources of income, as well as control over income earned. In this regard, the potential of women to save will be capitalised upon, especially on a group basis. To the extent possible, group activities that provide livelihood opportunities would be encouraged.

With soil conservation measures and extension support, land and agricultural productivity increases. Farm production increases in terms of both food crops and farm products (e.g. eggs, chicken, dairy products, etc.). When this is coupled with information and inputs on nutrition and nutrition oriented agricultural practices, e.g. kitchen gardens, appropriate food crops etc. the nutritional status of the family and village is progressively improved.

4.5. Extent of linkages of the institutions in the WDP

Extent of linkage is the amount of relationship each institution have with the development programmes. Here the perception of the people is taken as how much they were important and functioned in their perspective. The extent of the linkage is established by a new methodology developed for the study *viz.* parallelism.

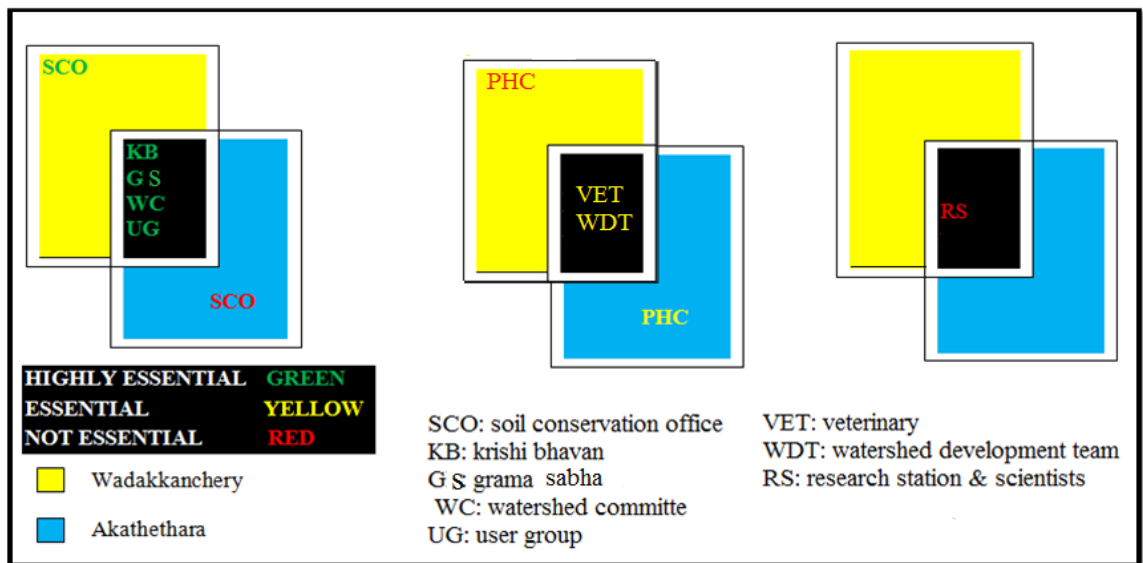
Here, the yellow coloured box represents the Wadakkanchery panchayath and the blue box represents the Akathethata pachayath. The fonts in different colours represent the institutions working at the village level for their upliftment in their particular assigned field. The green coloured font represent the highly essential institutions as the stakeholders perceived, the yellow represent those are essential and the red represent those institutions whose importance were not perceived by the people.

As seen in Fig. 3, the common box coloured black represents the institutions that are equally perceived by the two panchayaths. It reveals that the '*Krishibhavan*', 'user

groups/SHGs’, ‘watershed committee’ and the ‘*Grama sabha*’ were kept close to the people (Mondal and Singh, 2011). The soil conservation office was close to the people of the Wadakkanchery but it could not find a place in the Akathethara. This implies that the beneficiaries should be made aware about the institutions as well as the department should try to mingle with the people and make them into confidence, unless the most important institutions will not be perceived by the people.

Similarly the ASHA workers of the primary health centers has a major part in the developmental activities since they reach up to the lowest level, ignored part of the society and bring them forward to the society especially the tribal.

Fig.3 : Parallelism of institution linkage between panchayaths of study



The extent of involvement of each institution was rated by the stakeholders. The extent of linkage is well expressed in fig. 4. and fig. 5. of Wadakkanchery and Akathethara respectively.

Here the boxes represent the institutions. The big circle represents the people of the village. The lines represent the involvement. The bold line represents the direct linkages and the dotted line represents the indirect linkage. The distance of each line represents how close they were to the programme. Greater the length lesser was the involvement.

'*Krishibhavan*' is close to both the panchayaths. The 'soil conservation office (SCO)' is close to the Wadakkanchaery panchayath but away from the Akathethara panchayath since the project implementing agency is SCO in Wadakkanchery and local self government institution in Akathathara. The primary health centre is more close to the Akathethara since the Accredited Social Health Activist(ASHA) workers are also got into the mainstream of the developmental activity. The 'research station (RS)' as they had no direct role in the watershed developmental programme, they are not close to the stakeholders.

Fig. 4.:Extent of linkage in Wadakkanchery

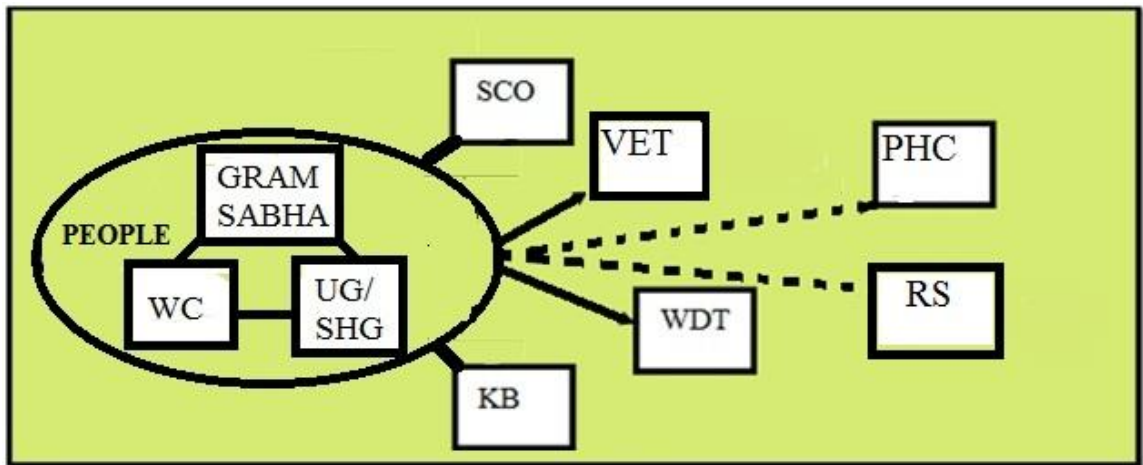
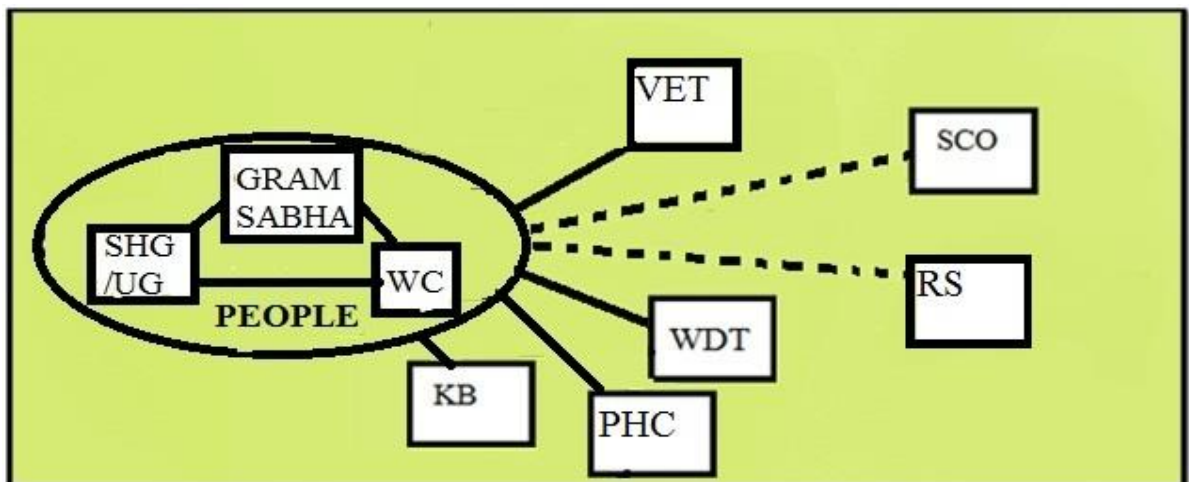


Fig.5: Extent of linkage in Akathethara



SHG: self help group *UG*: user group *WC*: watershed committee *WDT*: watershed development team
PHC: primary health centre *KB*: Krishi bhavan *VET*: veterinary *RS*: research station
SCO: soil conservation office

The involvement of the institutions in the development programme are essential for the smooth functioning of the programme. Sustainability is greatly enhanced when local institutional actors such as government as well as private agencies are involved in delivering of goods and services. Wherever possible, existing government programmes and networks will be accessed and availed of schemes and other projects. This will help create a sense of ‘joint ownership’ of the project which is necessary from the point of maintenance and continuity. People’s initial quest is for information, knowledge and skills related to their daily responsibilities and activities. This should be taken into consideration by each linked in institution.

4.6. Constraints faced at different stages of the WDP

The constraints were the impediments that determine the smooth functioning of any development activity. The Table 14 and Table 15 given below list out the various constraints that happened in the planning as well as the implementing phase of the programme.

Table 14: Constraints in the planning stage perceived by the two panchayath

(N=90)

Wadakkanchery	Akathethara
<ul style="list-style-type: none"> • Gaps in existing data • Lack of quality man power to collect data • Exhaustive data collection • Lack of expertise • Beneficiaries were not taken into confidence • Beneficiary feels it as a target oriented work and has to be implemented by any means • Too little time officials spend with beneficiaries 	<ul style="list-style-type: none"> • Gaps in existing data • Lack of quality man power to collect data • Exhaustive data collection

The gaps in the existing data were major problem in the planning stage. The constraints expressed by the stakeholders during planning phase under the panchayaths were ‘gaps in existing data’, ‘lack of quality manpower’ and ‘exhaustive data collection’. Whereas Wadakkanchery panchayath expressed additionally ‘lack of expertise’, ‘beneficiaries were not taken into confidence’, ‘beneficiary feels it as a target oriented work and has to be implemented by any means’ and ‘too little time officials spend with beneficiaries’.

The results of constraints expressed by both the panchayath at planning phase could be explained that the implementing agencies communication with the people was very low and the procedure laid down for data collection was also very cumbersome coupled with lack of skilled and trained man power. Hence, may be the reasons for such results.

Table 15. : Constraints in the implementing stage perceived by the two panchayath

(N=90)

Wadakkanchery	Akathethara
<ul style="list-style-type: none"> • Lack of community participation • Bureaucratic nature of implementation • Target oriented work and becoming to be implemented by any means • Fund disposal problems • Failure to reach consensus among beneficiaries due to issues in the ownership of contiguous areas 	<ul style="list-style-type: none"> • Failure to reach consensus among beneficiaries due to issues in the ownership of contiguous areas • Women labourers find it difficult to do the work (work drudgery)

Common for both the constraints expressed during the implementation phase was ‘failure to reach consensus among beneficiaries due to issues in the ownership of contiguous areas’. Whereas the Wadakkanchery panchayath expressed additionally, ‘lack

of community participation’ as reported by Sanghi and Rao (1982), ‘bureaucratic nature of implementation’, ‘target oriented work and becoming to be implemented by any means’, and ‘fund disposal problems’ as important constraints and Akathethara felt work drudgery for the women as the major constrain.

During the implementation phase the constraints expressed at Wadakkanchery was more compared to Akathethara. The constraints expressed were genuine as the implementing agency Soil Conservation Office as a government agency their focus was more to complete targets with strict official formalities which keep the people away from the programme and participation was very low.

Whereas in Akathethara, the implementing agency is Local self government institution, the participation and involvement of people was more. Hence, these may be the reasons for these results.

4.7. Gender issues involved in the WDP

Gender issue was arrived at by observation by the researcher as well as by asking the respondents directly to express their views especially women alone. The results in the form of issues are narrated below.

i. Role of women in decision making was less:

Here the women members were attending the meeting for the sake of attendance, but their involvement in decision making in the phases like planning phase and implementation phase were almost nil.

ii. Women have no title deed of property:

As the cultural and patrilineal system prevailing in Kerala state make the women members without any claim on the land or property. All title deeds are vested with male members only.

iii. Women involvement in WDP is name sake:

Here especially in forming of SHG, exclusively for women, their involvement will be there for counting the membership, but their involvement, role and active participation was less.

iv. Wages differences between male and female laboures:

The discrimination in wages due to biological discrimination between male and female is still in vogue. This disparity should be removed by offering equal wages irrespective of nature of work done.

v. Work drudgery is more for women:

In WDP, the nature of work *i.e.* bund formation, digging pits, making ridges etc require masculine power as it involves more drudgery. Women could not execute such type of physical work to the extent of their counterpart, the male members. This drudgery reduces the work output and resulting in low wages.

4.8. Profile characteristics of watershed development programme stakeholders:

4.8.1. Age of the stake holders

Table 16: classification of the stake holders based on their age

(N=60)

Categories	Age (years)	Male		Female	
		Number	Per cent (%)	Number	Per cent (%)
Young	< 35	0	0	0	0
Middle	35-45	13	43	21	70
Old age	> 45	17	57	9	30

Viewing the Table 16, it is clear that more than half of the male farmers were aged (57%) and remaining (43%) were falling under the middle age category. Raghunandan (2004) also reported a similar finding. Whereas the female category, majority (70%) of them were middle aged and only (30%) were aged category. Hence it is inferred that most of the male stakeholders were aged and the female stakeholders were middle aged category.

It was observed that most of the male stakeholders were under ‘aged’ category and the female category under the ‘middle aged’. This is due to the reason that the actual practicing stakeholders are now-a-days with aged category and no youngsters were attracted to agriculture as they like to have blue collar job. Whereas the housewives in the middle aged category were influenced by various schemes like SHG, *kudumbasri* and WDP programmes for making additional income. Hence that may be the reason for such results.

4.8.2. Education of the stake holders

Table 17: classification of the stake holders based on their Education

(N=60)

Categories	Male		Female	
	Number	Per cent (%)	Number	Per cent (%)
Illiterate	0	0	0	0
Upto high school	8	27	13	43
High school	16	53	17	57
College	6	20	0	0

The Table 17 reveals that no one in the sampled stakeholders was illiterate. It implies that sampled farmers were literate.

The male and female have almost equal educational status upto high school level, where as college level education was found in 20 percent male stakeholders. Gupta (1999) also reported 43.34 per cent of the respondents were educated upto middle school

The educational level in Kerala was declared cent percent literacy. More over the male stakeholders had educational level from high school to college level of education so as to have assured job in the Government. In the same corollary this could be explained that female stakeholders had also equal chances of job reservation as well as the urgent need for education in understanding various scheme or beneficiary avenues.

4.8.3. Land holding of the stakeholders

Table 18: Classification of the stake holders based on their Land holding

(N=60)

Holding size name	Male		Female	
	Number	Per cent(%)	Number	Per cent (%)
Large Farmer (> 5 ha)	0	0	0	0
Medium Farmer (> 2 ha and \geq 5 ha)	0	0	0	0
Small Farmer/ Marginal Farmer (\leq 2 ha)	30	100	30	100

All the farmers irrespective of gender and village were belonging to the marginal farmer group. Madhavareddy (2001) also found a similar result.

Regarding the size of the holdings, all stakeholders were under small and marginal farmers category. This is true; in fact the average size of holding in Kerala is less than one acre. Hence, the sample is the true representation of population.

4.8.5. Income of the stake holders

Table 19: Classification of the stake holders based on their income

(N=60)

Income group (in Rs. Per year)	Male		Female	
	Number	Per cent(%)	Number	Per cent(%)
Low (6,000-19,000)	16	53	19	63
Medium (19,000-32,000)	10	33	8	27
High (32,000-45,000)	4	14	3	10

It is seen from the Table 19 that the income level of the male and female stakeholders were in the low category with the percentage of 53 and 63 respectively. Narasimha (1980) reported a similar result. Under the medium level of income, the male had higher percentage of 33 and female had low 27. Altogether the high level of income distribution was 14 and 10 percent respectively for men and women.

Hence, it is inferred that almost more than half of the stakeholders irrespective of gender were in the low level of income group.

This could be due to the fact that the stakeholders were now-a-days not getting remunerative prices as well as agricultural related works and considerably their standard of living is also coming down. Hence may be the reason for the low level of income per year. The women category under low income was also high (63%) compared to male category because the difference in wage rate between the men and women.

4.9. Suggestions for effective gender mainstreaming in the WDP

Suggestions are formulated based on the observations, analysis and the results. The suggestions are follows.

1. Need based training must be imparted for both the gender

i. Training needs analysis for both genders

ii. Training methodology and type

Each gender has its own roles, and its own skilled area and so based on that the training need should be analysed for both the genders. Based on their need, training must be given and appropriate methodology must be chosen.

2. Youngsters must be given more preference in the watershed committee and user groups. Since the educated members are going away from the agriculture, there is a need to bring them back to the agricultural development activities.

3. Vertical and horizontal integration must be strengthened to ensure better participation. Horizontal integration will ensure the better involvement of the institutions working at the village level. The vertical integration will help the village level institutions

in evaluating the work accomplishment of their respective unit and to take up periodical monitoring and evaluation would ensure effective coordination among other institutions also.

4. The office bearers and the task force members should scrupulously follow the prescribed guidelines: Government of India has put forth ‘Common Guidelines For Watershed Development Programmes’ in Kerala. It clearly states the roles and responsibilities of each participating groups. If the institution follows the specific roles, the project will be successful.

5. A nodal officer must be identified from the implementing agency who will coordinate all institutions on the village: the nodal officer now existing is not effective. Hence the prime institution must be identified to coordinate all institutions as a nodal officer.

6. Periodical monitoring and evaluation should be done, and should be made an integral part of WDP.

7. Rural social institutions must be motivated for ensuring their effective participation in the WDP: Rural social institutions plays most important role and they should be involved more as they are close to the people.

Summary and Conclusion

Summary and Conclusion

The study was taken with the overriding objectives to explore the gender issues that are involved in watershed development programmes in Kerala, to find out the dimensions of watershed development programme at various levels of formulation and implementation and the constraints from a gender perspective and the training needs of the women stakeholders involved in watershed development programmes. The study also intends to suggest various measures for effective gender mainstreaming in watershed development programmes in Kerala.

In order to achieve the objectives the study was designed in *ex-post facto* research design. The study was undertaken in Wadakkanchery and Akathethara panchayaths of Thrissur and Palakkad districts of Kerala. All together 90 respondents comprising 15 men 15 women and 15 implementing officers of each panchayath was taken for the study. The dependent and independent variables were selected based on the objectives of the study, review of literature and concerned experts related to the field. The dependent variables like “Dimensions of the watershed development programmes in Kerala”, “Training needs of the women stake holders”, “Knowledge level of the women” and “Extent of linkage among the different institutions involved in the project” were measured by using techniques like “scoring procedure with a continuum of 3 to 1”, “training need importance scoring procedure with the continuum of 3 to 1” “teacher made test” and “adopting a new methodology called parallelism” respectively.

The independent variables like age, education, landholding and income were selected from judges rating. The age were categorised by using Government of India classification as, young, middle age and old. Education was measured by assigning score “1” for every successful completion of formal education. The education was classified as “illiterate”, “upto high school”, “high school” and “college”. The land holding size was classified as “Small Farmer/Marginal Farmer “Medium Farmer” and “Large Farmer”. Income was measured in rupees taking the total annual income of all the members of the family.

The data were collected by using pretested interview schedule. The data were subject to statistical analysis like “t-test”, “simple correlation”, “frequency and percentage analysis” for interpreting the data meaningfully and explained objective systematically. The following results were derived from the analysis:

5.1.1 Dimensions perceived by the stakeholders

- The dimensions perceived by the beneficiaries under the planning phase by the Wadakkanchery and Akathethara panchayath were one and the same except two dimensions additionally perceived in the Akathethara and the same was perceived by men also
- Under the implementation stage also the same trend was observed in two panchayaths. Men and women perceived the same dimensions consistently
- Under the withdrawal and follow up phase the perception by men and women as well as at panchayaths level were one and the same

5.1.2 Training needs of women stakeholders

- The training needs of women and men were one and the same.
- There exist a negative relationship between the education and training need of the stakeholders.

5.1.3 Knowledge level of women stakeholders

- There is no difference in the knowledge level of men and women.
- There exists no relationship between the knowledge level and the characteristics of respondents

5.1.4 Extent of linkage among institutions

- The linkage study indicates the Wadakkanchery panchayath perceived “soil conservation office” as most essential institution where as Akathethara perceived the same as least essential.
- The horizontal integration results revealed that “*grama sabha*” and “watershed committee” having a direct linkage with the “soil conservation office” and “*krishi bhavan*” at Wadakkanchery.

- The institutions like "primary health centre", "watershed development team" and "veterinary" shows a direct linkage but less involvement, the least involvement was observed with the research station.

5.1.5 Constraints at different stages

In the Planning phase the major constraints were, 'Gaps in existing data', 'Lack of quality man power to collect data', 'Exhaustive data collection', 'Beneficiaries were not taken into confidence', 'Beneficiary feels it as a target oriented work and has to be implemented by any means', and 'Too little time officials spend with beneficiaries'

In the Implementation phase the major constraints were 'Lack of community participation', 'Bureaucratic nature of implementation, 'Target oriented work and becoming to be implemented by any means', 'Fund disposal problems', 'Failure to reach consensus among beneficiaries due to issues in the ownership of contiguous areas' and 'Women labourers find it difficult to do the work'.

5.1.6 Gender issues in watershed development programme

- The role of women in decision making were less
- Women have no title deed on property
- Women involvement in watershed development programmes is name sake
- Wage differences
- Work drudgery is more among women

5.1.7 Socio economic characteristics

- Most of the male stakeholders were aged and the female stakeholders were middle aged category.
- The male and female have almost equal educational status upto high school level, where as college level education was found in 20 percent male stakeholders.
- All the farmers irrespective of gender and village were belonging to the marginal farmer group.
- Almost more than half of the stakeholders irrespective of gender were in the low level of income group.

5.1.7 Suggestions for effective gender mainstreaming in the WDP

Suggestions are formulated based on the observations, analysis and the results. The suggestions are follows.

- Need based training must be imparted for both the gender
 - i. Training need analysis for both gender
 - ii. Training methodology and type
- Youngsters must be given more preference for including in the watershed committee and user groups. Since the educated members are going away from the agriculture, there is a need to bring them back to the developmental activities.
- Vertical and horizontal integration must be strengthened to ensure better participation.
- The office bearers and the task force members should scrupulously follow the prescribed guidelines.
- A nodal officer must be identified from the implementing agency who will coordinate all institutions on the village.
- Periodical monitoring and evaluation should be done, and should be made an integral part of WDP.
- Rural social institutions must be motivated for ensuring their effective participation in the WDP.

Conclusion:

The implementing agency in Akathethara is Local Self Government. The representatives, ward members as well as the committee members were effective in mobilizing the people of Akathethara panchayath. Hence their participation in the watershed developmental programmes was more compared to the Wadakkanchery panchayath.

The participation of women in the watershed development programme is less, even if they participate they have no role in the decision making. Not even for women, majority of men are also are passive participants. More over the groups formed comprising the women(SHG) are less active, and sometimes, it forms and perish.

Vertical and Horizontal linkages need to be strengthened. The village level institutions should be motivated to take part actively in the development programmes. Since watershed programme is a wholistic approach programme, where each unit in the village whether institution or people, has specified role to play. Apart from these, the vertical integration must be enhanced, so that the concerned institution may get more funds for the interventions, if they want to do.

The watershed development programmes are implemented in a wholistic approach considering the natural resources, the human resources, livestock etc. Thus if we are able to tackle the constraints and issues this will prove to be a successful.

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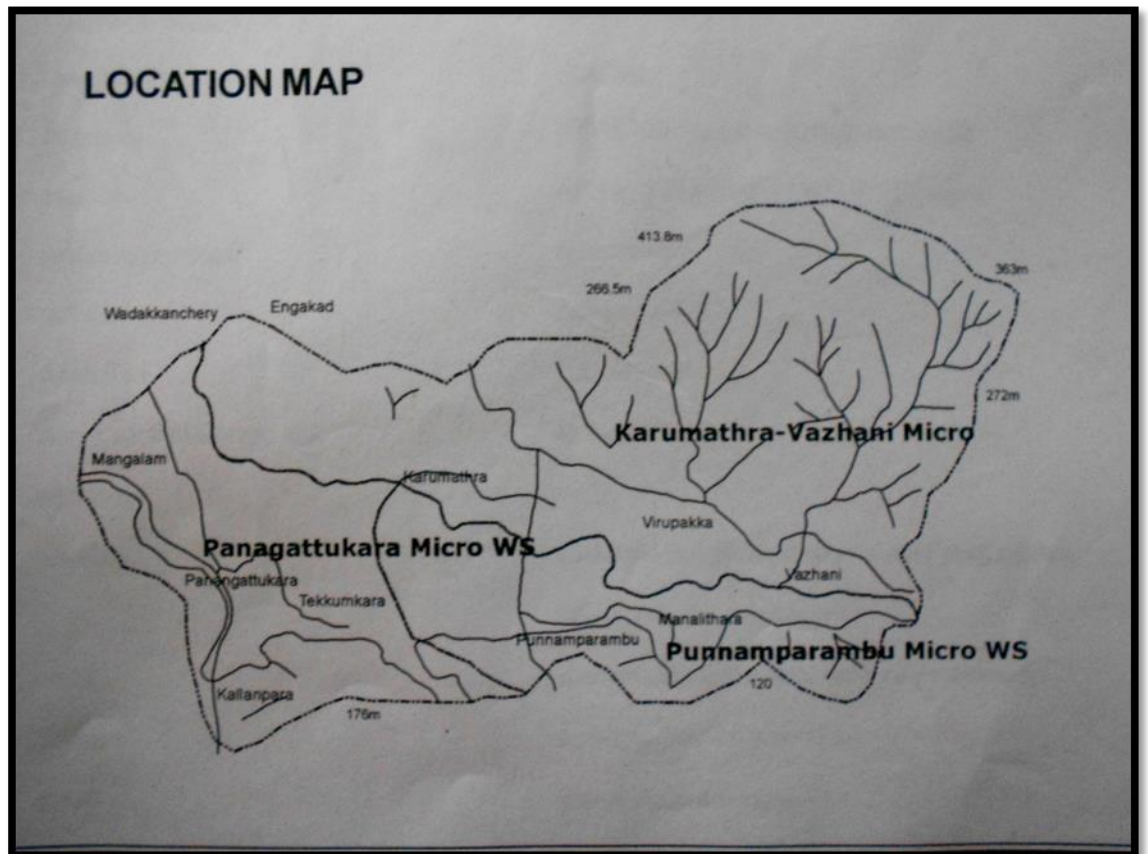
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Appendices

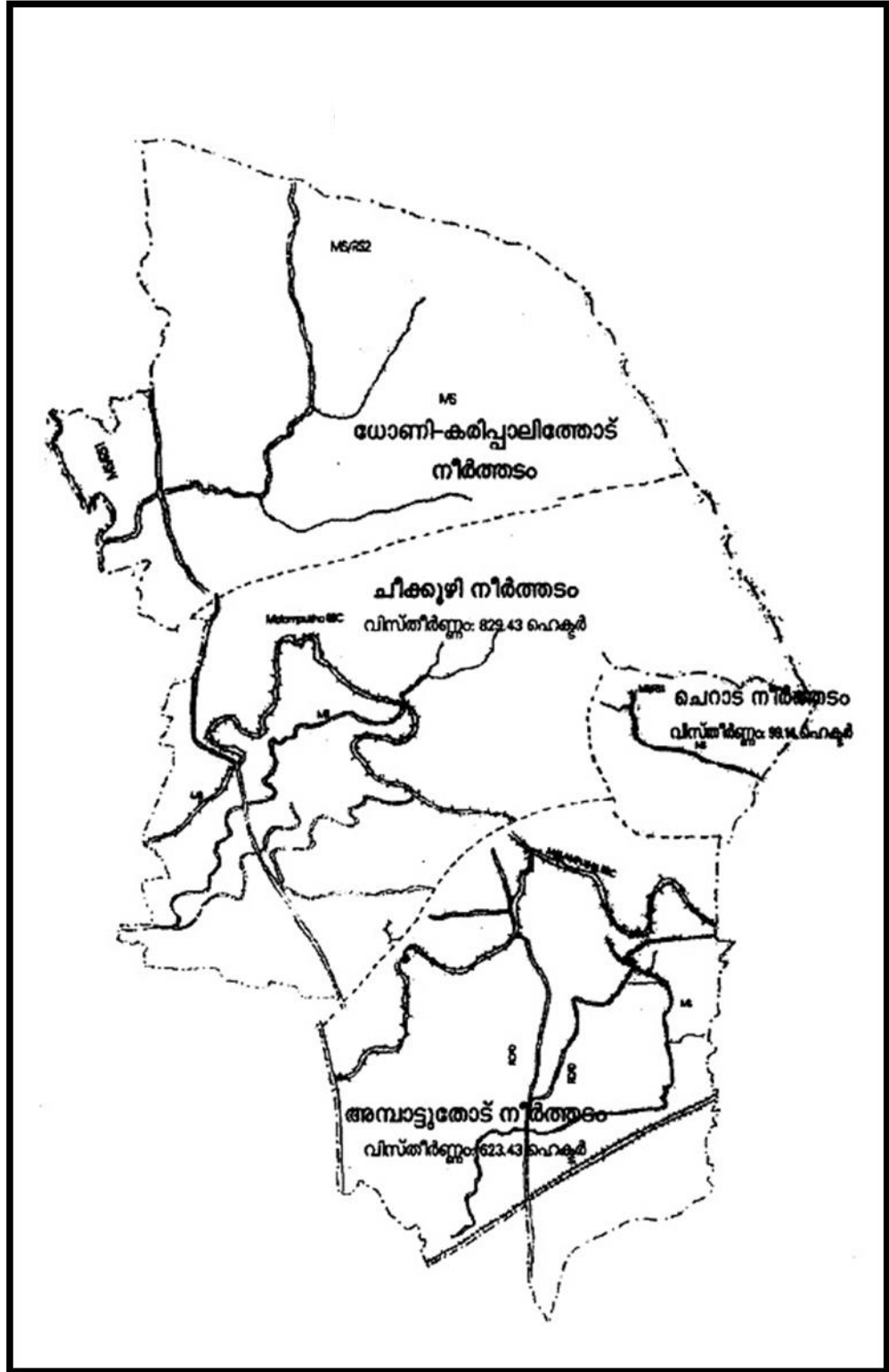
APPENDIX I

MAPS OF THE WATERSHEDS IN PANCHAYATH

Map of Wadakkanchery watershed



Map of Akathethara watershed



APPENDIX II
VARIABLES RATING BY JUDGES

Efficacy of watershed development programmes in Kerala: A gender perspective

Objectives of the study

1. To explore the gender issues involved in watershed development programmes(WDP) in Kerala
2. To find out the dimensions of WDP at various levels of formulation and implementation and the constraints from a gender perspective
3. To assess the training needs of the women stakeholders involved in WDP
4. To suggest measures for effective gender mainstreaming in WDP in Kerala

Variables

Kindly rate the variables listed below according to their relevance in the proposed study. This is done to include the most relevant variables in the final questionnaire. Kindly put a tick mark on any one of your option provided against the variables listed.

The options for your options are: , , less important and

- 1) Not relevant (NR)
- 2) Less important (LI)
- 3) Important (I)
- 4) Most important (MI)

Relevancy rating table

Sl. No.	Independent variable	Relevancy Rating scales			
		NR	LI	I	MI
	Profile of the beneficiary				
1	Age				
2	Gender				
3	Education				
4	Size of family				
5	Occupation				
6	Land holding				
7	Type of house				
8	Income				
9	Socio-politico participation				
10	Farm and material power				
11	Information sources				
	Dependent variables	HR	R	SR	N
1	Knowledge level of stakeholders				
2	Training needs of stakeholders				
3	Benefits of the watershed development programme				
4	Dimensions of watershed development programme				
5	Extent of linkages in the watershed development programmes				
6	Gender issues occurring in the watershed development programme				
7	Constraints of the watershed development programme at different stages.				

APPENDIX III
INTERVIEW SCHEDULE

DEPARTMENT OF AGRICULTURAL EXTENSION
College of Horticulture
Vellanikkara

INTERVIEW SCHEDULE- FOR STAKEHOLDERS

Respondent no: _____ Date of visit: _____

Name of the beneficiary: _____ Age: _____

Address & contact no: _____ Sex: _____

Caste: FC/BC/SC/ST

Office bearer/member: _____

I. Profile of beneficiaries:

1. Family details:

Member of family & relationship to head	Age	Sex	Educational status	Employment status		Income	
				Primary	Secondary	Primary	Secondary

2. Family status: nuclear/ joint

3. Type of house: a. thatched/tiled/terraced/other b. un-electrified/electrified

4. Farm status:

Type of land	Area	Status of cultivation
1 Garden 2 Wet 3. Homestead		

5. Farm power and material status:

Sl. no.	Items	Numbers	Sl. No.	Items	Numbers
a.	Country plough		f.	Oil engine	
b.	Iron plough		g.	Bullock cart	
c.	Working animals		h.	Pumpset	
d.	Milch animals		i.	Tractor	
e.	Power sprayer				
j.	Other mention:				

6. Social participation status:

Sl. No.	Institutions/committees	Position	
		Member	Office bearer
1	Panchayat/block/district		
2	Milk cooperative society		
3	Service cooperative society		
4	Watershed committee		
5	User group		
6	SHG		
7	Gram sabha		
8	Others mentions:		

7. Farming experience: (please mention number of years of experience in following)

a. Agriculture(1)/A.H(2)/Fisheries(3)/dairying(4)/agroforestry(5)/any other ____years

b. How many years do you have involvement in WDP: ____years

8. Information sources:

a. Personal contacts: yes/no

Sl no.	Sources	Personal	Purpose	Type of Information
I	In dept. of agriculture	1. AO 2. Agrl. Assistant 3. Soil conservation		

II	Agricultural university	officer 4. VFPCCK 5. Kudumbasree 1. ATIC 2. Communication centre 3. Colleges 4. Research stations 5. Scientists		
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b. Extension sources

Sl no	Sources	Purpose	Type of Information
1. 2. 3. 4.	Seminar Training Programme Exhibition Others(mention):		

c. Mass media sources:

Sl no	Sources	Purpose	Type of Information
1. 2. 3. 4. 5. 6.	Scientific books Newspapers Agriculture magazines Television Radio Other(mention):		

II. KNOWLEDGE LEVEL OF WOMEN STAKE HOLDERS:

1. The WDP is implemented by the local panchayath: Y/N
2. Local people are included in the planning phase of the WDP: Y/N
3. The secretary of the WDP is an selected and paid functionary: Y/N
4. The unit of implementing the WDP is block: Y/N
5. People's participation is the prime principle behind WDP: Y/N
6. WDP has three phases, planning, implementation and withdrawal phase: Y/N
7. Baseline survey is required for the DPR preparation: Y/N
8. WDP is an employment guarantee programme of GOI: Y/N
9. WDP is an input providing programme: Y/N
10. Contour bunds are made to check the soil erosion: Y/N
11. Percolation tanks need to be built for ground water recharging: Y/N

12. User charges will be collected for the common property resources: Y/N
13. Water table will increase due to the WDP: Y/N
14. Employment opportunities will be increased due to the WDP: Y/N
15. All types of resources can be exploited in rural areas under WDP: Y/N
16. 10% of the fund is taken from the people: Y/N
17. The user groups/ panchayath has to willingly take over the operation and maintenance of the assets : Y/N
18. The WDP programme is linked to all the developmental departments: Y/N
19. WDP can be linked to other developmental schemes of the government: Y/N
20. Watersheds are selected based on the scarcity of water and willingness of people to function together: Y/N

III. TRAINING NEEDS:

Sl. No.	Type of area	Not needed	important	More important	Most Important
1.	Soil and water conservation a. Drainage line treatment b. Water harvesting structures c. Ridge area treatment d. Land development				
2.	Crop related a. Cropping sequence b. Selection of crop and varieties c. Seed rate d. Manures and fertilizers e. Plant protection f. Irrigation g. Intercropping				
3.	Water harvesting techniques a. In-situ water conservation b. E-situ water conservation c. Roof top water harvesting				
4.	Land capability and crop planning a. Soil characteristics and types b. Crop selection by land capability				
5.	Employment generation a. Poultry b. Livestock c. Fisheries d. Employment programmes				
Others mention any:					

	harvesting structures <ul style="list-style-type: none"> • Nursery raising • Land development measures • Crop demonstrations • Veterinary services • Fisheries development • Promotion and propagation of non conventional energy sources • Development of CPR 									
3.	Withdrawal and follow up <ul style="list-style-type: none"> • Documentation • Allotment of CPR • Maintenance of assets created • Sustainable utilization of developed resources • Involvement of panchayath in addressing the above aspects • Evaluation of the project 									

V. CONSTRAINS AT DIFFERENT STAGES OF WDP

Do you perceive any constraints in WDP

Sl. No.	Steps in watershed planning	Major constraints in the order of severity	Yes	No
	Resource appraisal of watersheds	<ul style="list-style-type: none"> • Lack of availability of data for situation analysis and benchmarking • Lack of handy and participatory tools • Lack of training in participatory tools • Over dependence of external agencies • Inadequacy of indigenous resources to undertake the programme 		
	Secondary data review	<ul style="list-style-type: none"> • Lack of local expertise in drawing inferences • Lack of reliable data sources • Inadequate access to relevant data sources • Gaps in existing data 		
	Primary data collection for watershed planning and socio economic analysis	<ul style="list-style-type: none"> • Exhaustive data collection becomes impractical due to huge cost and time involved • Lack of expertise in developing data collection tools • Lack of quality manpower at the local level to collect data • Lack of expertise in collecting and analyzing data 		
	Formulation of projects and preparation of	<ul style="list-style-type: none"> • Inept formulation of projects 		

Sl. No.	Steps in watershed planning	Major constraints in the order of severity	Yes	No
	watershed plans	<ul style="list-style-type: none"> Lack of technical inputs for better projectisation Too little time was spent by the officials to meet the beneficiaries Training and meeting place inconvenience Budgetary provisions were not discussed with beneficiaries Beneficiaries role in watershed activities and benefits desired by them were not discussed before starting the programme Beneficiaries were not taken into confidence Beneficiary feels it as a target oriented work and has to be implemented by any means Government field functionaries have not established rapport with beneficiaries Political interferences 		
	Implementation phase	<ul style="list-style-type: none"> Failure to reach consensus among beneficiaries due to issues in the ownership of contiguous areas Lack of regular monitoring Lack of community participation in implementation Bureaucratic nature of implementation Lack of guidance due to non availability of staff at the time of farmer need Mid-term monitoring and evaluation were not done Target oriented work and becoming to be implemented by any means Fund disposal problems 		
	Withdrawal and follow up phase	<ul style="list-style-type: none"> Results of watershed interventions not perceptible Agencies would be in a hurry to withdraw Sustainable institutional mechanisms not evolved Lack of knowledge of UG on the maintenance of the structures UGs finding financial crisis to take over the maintenances 		

VI. INSTITUTIONAL LINKAGES:

Please specify the extent of participation/linkage with WDP of the village:

Sl. No.	List of institutions	Highly essential	Essential	Some what essential	Not essential
1.	KRISHIBHAVAN				
2.	SOIL CONSERVATION OFFICE				
3.	GRAMA SABHA				
4.	WATERSHED COMMITTEE				
5.	WATERSHED DEVELOPMENT TEAM				
6.	SELF HELP GROUPS				
7.	RESEARCH STATION				
8.	PRIMARY HEALTH CENTRE				

VII. BENEFITS OF THE PROGRAMME

Sl. No.	BENEFITS	Increased	No change	Decreased
1.	Income			
2.	Education			
3.	Water level			
4.	Water scarcity			
5.	Soil erosion			
6.	Participation			
7.	Irrigation			
8.	Cropping intensity			
9.	Crop yield			
10.	Standard of living			
11.	Employment			

Viii. Gender issues/suggestions for increasing the efficiency of WDP (addressed during the different phases of the WDP)

1. Planning phase:

2. Implementing phase

3. Any others

Abstract

**EFFICACY OF WATERSHED DEVELOPMENT PROGRAMMES
IN KERALA: A GENDER PERSPECTIVE**

By

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(2010-11-139)

ABSTRACT OF THE THESIS

*Submitted in partial fulfillment of the
requirement for the degree of*

MASTER OF SCIENCE IN AGRICULTURE

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2012

ABSTRACT

Watershed development programmes were taken up under different programmes launched by GOI. As a prelude to these, a number of programmes were implemented viz. DPAP, DDP and IWDP etc with a common objective to conserve the soil and water resources for sustainable management. In 2008 GOI formulated common guidelines for watershed development projects in order to have a unified perspective by all ministries. There is a need to know the perspective about the watershed development programme, the beneficiaries' knowledge level etc. So far no attempt has been made to such aspects. Hence the study was designed with the following objectives, to explore the gender issues involved in watershed development programmes in Kerala, to find out the dimensions of watershed development programme at various levels of formulation and implementation and the constraints from a gender perspective and to access the training needs of women stakeholders in watershed development programme. The study also intends to suggest various measures for effective gender mainstreaming in watershed development programmes in Kerala.

The study was taken up in two panchayaths of Akathethara of Thrissur and Wadakkanchery of Palakkad. Random sampling procedure was adopted to select 15 each from male, female and the implementing officers to form a total sample size of 90 from both panchayath. A pretested interview schedule, observations technique as well as group discussion method were the tools used for the data collection.

The knowledge level of women stakeholders was very high. There is no differences in the knowledge level of men and women. There exists no relationship between the knowledge level and the characteristics of respondents. The training needs of women and men were one and the same. There exist a negative relationship between the education and training need of the stakeholders.

Regarding the dimensions perceived by the beneficiaries under the planning phase by the Wadakkanchery and Akthethara panchayath were one and the same except two dimensions additionally perceived in the Akathethara and the same was perceived by men also. Under the implementation stage also the same trend was observed in two

panchayaths. Men and women perceived the same dimensions consistently. Under the withdrawal and follow up phase the perception by men and women as well as panchayaths were one and the same.

The linkage study indicates the Wadakkanchery panchayath perceived soil conservation office as most essential institution where as Akathethara perceived the same as least essential. The horizontal integration results revealed that “grama sabha” and “watershed committee” having a direct linkage with the “soil conservation office” and “krishi bhavan” at Wadakkanchery. The Akathethara panchayath showed a direct and close linkage with the “krishibhavan”. The institutions like the "PHC”, “watershed development team” and the “veterinary” shows a direct linkage but less involvement, the least involvement with the research station.

The following gender issues were explored viz. “The role of women in decision making are less”, “Women have no title deed of property”, “Women involvement in WDP is proxy”, “Wage differences” and “Work drudgery is more among women”

The following suggestions are made out of results and experiences of researcher. The need base training should be imparted to the stakeholders. The youngsters must be encouraged to participate and should be given preference for including in the groups and committee. Vertical and horizontal linkages must be strengthened so as to ensure the participation of the institutions.

Watershed development programmes will be more effective and a successful programme if it is implemented effectively with a wholistic approach.