

**ASSESSMENT OF TRAINING NEEDS OF OFFICIALS
OF J&K STATE FISHERIES DEPARTMENT**

Irtifa Gull

(2015-F-35-M)



Faculty of Fisheries

**Sher-e-Kashmir University of Agricultural Sciences &
Technology of Kashmir**

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Thesis

Submitted to
**Faculty of Fisheries Sher-e-Kashmir University of Agricultural
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in partial fulfilment of requirement for the award of the degree of

**Master of Fisheries Science
(Fisheries Resource Management)
2018**



*Dedicated
To my dear
Parents.*

Sher-e-Kashmir
University of Agricultural Sciences & Technology of Kashmir

Faculty of Fisheries, Rangil, Ganderbal

Certificate – I

This is to certify that the thesis entitled, “**ASSESSMENT OF TRAINING NEEDS OF OFFICIALS OF J&K STATE FISHERIES DEPARTMENT**” submitted in partial fulfilment of the requirements for the award of the degree of **Master of Fisheries Science (Fisheries Resource Management)**, to the **Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir** is a record of bonafide research work carried out by **Ms. Irtifa Gull (Reg. No. 2015-F-35-M)** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

It is further certified that information received during the course of investigation has duly been acknowledged.

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Certificate – III

This is to certify that the thesis entitled, “**ASSESSMENT OF TRAINING NEEDS OF OFFICIALS OF J&K STATE FISHERIES DEPARTMENT**” submitted by **Ms.Irtifa Gull (Regd. No. 2015-F-35-M)** to the **Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir** in partial fulfilment of the requirements for the award of the degree of **Master of Fisheries Science (Fisheries Resource Management)** was examined and approved by the Advisory Committee and External Examiner on

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FISHERIES DEPARTMENT”**

ABSTRACT

Training need analysis (TNA) has been regarded as most important step to develop successful training programmes. TNA can provide organisation with valuable information to develop them in designing strategic training programme. It also has been concurred in the literature that any training intervention must begin with training analysis process. Existing literature on TNA shows that hardly any studies have been conducted on training need analysis of officials of state

fisheries department. With regard to this the present study was carried out to know and prioritized the training needs of fisheries officials so as to enable the department as well as faculty of fisheries to conduct need based training programmes. A total of 11 fisheries inspectors and 89 fisheries guards from district Srinagar and Budgam were interviewed. Data was analysed using SPSS

(Statistical package for Social Sciences). While assessing the overall knowledge level of fisheries inspectors it was found that majority of them had medium to low level of knowledge regarding the subject matter while none of the respondents were found in the category of high knowledge level. However, in case of fisheries guards the results deciphered that all the respondents had low knowledge level regarding various aspects of capture fisheries. This study not only assessed but also prioritised the needs of fisheries officials. Thus, it could be concluded from the study that need based training programmes must be organised for fisheries officials to enhance their knowledge, skills, expertise and thereby making them proficient in their respective jobs.

Key words: Training need Analysis, knowledge, Fisheries Officials

Signature of Student

Signature of Major Advisor

Dated _____

Dated _____

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Place: Rangil, Ganderbal

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Chapter 1

Introduction

Kashmir is endowed with significant and valuable stocks of fish, leading to a tradition and culture of fishing in the state. The state bestowed with a network of both cold & warm water streams, perennial rivers, lakes, reservoirs, sars and about 250 high altitude lakes spread over an area of 40 thousand hectares. There is an immense scope to promote all types of fisheries in view of State's varied agro-climatic conditions. The total fishermen population in the State as per livestock census 2003 was around 31,000. It is presently estimated to be around 93000. The 27781 Km. length of rivers/streams facilitates farming of more than 40 million tonnes of fish. As against this, the State has only 0.07 lakh hectares under reservoir area. There is a big gap between the demand and supply of fish. Fish is a valuable element of diet of the local people throughout the year. There is also a demand for fish from the defense personnel and tourists. There are 1248 lakes including water bodies and water is spread into 39921.8 hectares of area which gives an indication of the potential for fisheries in the State. The gap in the demand and supply suggest that the state needs to promote fish culture and at the same time need to be well equipped in terms of human capital to effectively execute its duties and responsibilities. Therefore, there is the need for capacity building.

The members of an organization are important assets that help the organization to reach new heights of the success and to implement and achieve its strategies and objectives successfully. For an organization to achieve its objectives and goals, its prerequisite is to focus on the role of its members. It needs highly competent, skilled and trained workforce. The level of competition in 21st century has made it compulsory for every organization to aim at increasing the power related processes to build and sustain the competitive advantage as the ultimate organizational objective, thereby outperforming competitors. Moreover,

to maintain the competitive advantage, the organization must ensure that their workforce should continuously learn and develop. Thus, modern organizations invest huge amount of money in training and learning programs of their employees (Salas *et al.*, 2012). The significance of the training has long been recognized. Given today's competitive climate and the exponential growth of the technology, the need for the training is more distinct than ever. (McClelland, 2002). Before planning the training programs, it is important to identify the training needs of the employees so that the effective training program can be designed. Training need assessment is a powerful tool that provides the detailed picture of employee's knowledge, skill and abilities.

1.1 Training

Training is responsible for building skilled, qualified and capable people, which helps organizations to improve their performance and adapt to any new change. There is no single definition for training. The simplest definition of training is the acquisition of knowledge and skills for presently know tasks (Crutchfield, 2000). Training is a planned and continuous process designed to meet the training needs of present and future of an individual through increasing knowledge and improving skills, which improves employees' performance and increases productivity at work. The word training refers to an act, process or method of one who train. It is accepted as a synonym for all the form of knowledge, skill and attitudinal development which one needed to keep the pace with accelerating life involvement and enlarging concepts of man's capability. It is a powerful tool to catalyze human resource development and refers to the totality of instructions, planned and directed activity to which a person is subjected to induce learning. Training is directed at the improvement of the performance and is an important process of the capacity building of individuals as to improve the performance. It is not only a force that leads to sustained, self-generating development but also it promises for those which are essential to modern technologies and economic systems i.e. flexibility in action through

understanding and confidence, inventiveness etc. (Lynton and Pareek,1990). It is a central component of human resource development which can generate desirable changes in the behavioral component such as knowledge, skill and attitude and plays a vital role in rapid transfer of technology through skill up gradation. Refresher training keeps the specialists, administrators, subject matter officers, extension supervisors and frontline workers updated and enables them to add to the knowledge and skills they already had. Maintenance or refresher training usually deals with new information and new methods, as well as review of older materials. This type of training is needed to both keep employees at the peak of their possible production and prevent them from getting into rut.

The International Labor Organization (1986) defined training as activities which essentially aims at providing the skills, knowledge and attitude required for employment in an occupation or for exercising a function in any field of economic activities. The sole objective of training is to bring about changes in the knowledge, attitude and skill in such a manner those learners begins to feel that he is more than what he used to be earlier and has a specific goal of improving one's capability, capacity, productivity and performance. One of the most important benefits on monitoring and evaluating training is that it can serve as a diagnostic technique to permit the revision of programs to meet the large number of goals and objectives (Mann & Robertson, 1996). Training is given on four basic grounds and they are: 1. New candidates who join an organization are given training. This training familiarizes them with the organizational mission, vision, rules and regulations and working condition.2. The existing employees are trained to refresh and enhance their knowledge.3. If any updates and amendments take place in the technology, the training is given to cope with those changes in technique of productions. The employee is trained about use of new equipment work methods.4. When the promotion and career growth become important, training is given so that the employees are prepared to share the responsibilities of higher job. The need for training arises due to the following factors.

- Higher Productivity: It is essential to increase the productivity and increase the cost of production for meeting the competition in market. Effective training can help in increasing productivity of workers by imparting the required skills
- Quality Improvement: The customers have been the quality conscious and their requirement keeps on changing. To satisfy the quality of the products must be continuously improved through training of workers.
- Reduction of learning time: Systematic training through the trained instructors is essential to reduce the training period. If the workers learn through the trial and error, they take longer time and even may not be able to learn right methods of doing work.
- Industrial Safety: Trained workers can handle the machines safely. They also know the use of various safety devices in the factory. Thus, they are less prone to industrial accidents.
- Reduction of Turnover and Absenteeism: Training creates a feeling of confidence in the minds of workers. It gives them a security at workplace. Thus, labor turnover and absenteeism are reduced.
- Technology update: Technology is changing at a fast pace. The workers must learn new techniques to make use of advance technology. Thus, training should be treated as a continuous process to update the employees in the new methods and procedures.
- Effective management: Training can be used as an effective tool of planning and control. It develops skill among the workers and prepares them for handling the present and future jobs. It helps in reducing the cost of supervision, wastages and industrial accidents. It helps to increase the productivity and the quality which are cherished goals of any modern organization.

The aims of training, as summarized by Armstrong (2006, p. 507), are as follows:

1. Learning time is shortened and the costs of training and the losses resulting from too lengthy a learning curve are reduced (the learning curve is the time taken to reach an acceptable level of performance)
2. The performance of existing employees is improved.
3. Commitment to the job and identification with the company are increased and
4. People's capacities are developed so that they can be better prepared for positions of greater responsibilities in the future.

Therefore, training is an important activity within an organization and that it is aimed at effecting positive changes in the trainees in terms of their knowledge, skills and attitudes, consequently improving their performance levels.

1.2 Identifying Training Needs.

In general, the identifying training needs step is recognized as one of the most important steps in training. This first step in training process is primarily conducted to determine where training is needed, what needs to be taught, and who needs to be trained. Thus, without this step, there can be no solid prognosis to diagnose if the whole training process was correctly designed (Anderson, 1994, Bowman and Wilson, 2008, Goldstein 1993).

1.3 Training Needs Assessment.

The clear definition of the needs assessment is given by Anderson (2000), who writes that the needs assessment is the starting point in the training process. It is the phase in which an organization's needs are identified, forming the foundation of an effective training effort. "Training Needs Assessment" (TNA) is the process of identifying the gap between employee training and needs of training. It is the first stage in the training process and involves a procedure to determine whether training will indeed address the problem which has been identified. Training needs analysis looks at each aspect of an operational domain so that the initial skills, concepts and attitudes of the human elements of a system can be effectively identified and appropriate training can be specified and is most often used as part of the system development process. Due to the close tie

between the design of the system and the training required, in most cases it runs alongside the development to capture the training requirements.

“Training Needs Assessment” (TNA) is also the method of determining if a training need exists and, if it does, what training is required to fill the gap. It seeks to identify accurately the levels of the present situation in the target surveys, interview, observation, secondary data and/or workshop. The gap between the present status and desired status may indicate problems that in turn can be translated into a training need.

Training Needs = Desired Capability – Current Capability of the Participants

TNA is also the process of collecting information about an expressed or implied organizational need that could be met by conducting training. The need can be a performance that does not meet the current standard. It means that there is a prescribed or best way of doing a task and that variance from it is creating a problem. The TNA process helps the trainer and the person requesting training to specify the training need or performance deficiency. Assessments can be formal (using survey and interview techniques) or informal (asking some questions of those involved). Identify dissatisfaction with the current situation and desire for change as similarities among the requests. Each request implies that a gap or discrepancy exists between what is and what could be or should be. A learning or performance gap between the current and desired condition is called a need. TNA aims at the following situations. Solving a current problem. a. Avoiding a past or current problem. Creating or taking advantage of a future opportunity c. Providing learning, development or growth.

The process of Training Needs Assessment can be divided into five steps and they are

- Identify problem
- Determine design of need analysis

- Collect data
- Analyze data
- Provide feedback

Therefore, training needs assessment is an ongoing process of gathering data to determine what training needs exist so that training can be developed to help the organization accomplish its objectives (Brown, 2002). Furthermore, the idea behind training needs analysis is that only when there is a match between training needs and the content of training, beneficial outcomes to organizational performance can be realized (Van Eerde, et al, 2008).

Fisheries sector of the state has an immense scope and promotes all types of fisheries due to varied agro- climatic conditions. There are various factors that contribute in enhancing the fisheries production from both capture as well as culture fisheries. However, one of the important components that can play pivotal role in enhancement, growth and development of the sector is the trained, skilled and knowledgeable manpower.

Extension activities like training at regular intervals can keep the manpower abreast with new technology, development and latest trends in fisheries sector.

However, random trainings can lead to wastage of resources and time. Therefore, training need analysis i.e. identify the training needs of the fisheries officials can help in organizing need- based and result-oriented trainings.

Keeping in view the above facts the present study was carried out with following objectives:

- To know the knowledge level of fisheries officials regarding the various subject areas of fisheries.
- To identify the gaps and assess the training needs of the respondent officials.

Chapter 2

DETAILED ACCOUNT OF THE RELVANT WORK DONE

2.1 Work done in India:

Kumran and Ponnusamy (2001), studied training needs of shrimp farmers. They interviewed the thirty shrimp farmers of Negapattinam coastal district of Tamil Nadu, in order to assess their training needs. They found that the personal profile of the farmers was of high level, however their relationship with the training needs was not significant. These farmers desired to acquire necessary knowledge and skills to deal effectively with the disease menace, seed quality, pond management and recent developments in aquaculture for sustainable shrimp production. Transfer of technology and human research development programmes of the research organizations and extension activities of the state fisheries department may be identified incorporating these training needs.

Jeeva *et al*, (2004), studied training needs of fisheries extension personnel in Andhra Pradesh. Their study showed that the effective extension system should have a solid technological base to facilitate the adoption of latest technologies by end users. Training needs assessment is a pre-requisite to prepare effective training strategies. This study was conducted with a specific object of assessing the training needs of fisheries extension personnel in the subject matter areas of harvest and post-harvest fisheries technologies. The study revealed that the extent of training need index score of the fisheries of the extension personnel varied from 38.10 to 95.24 with a mean score of 61.17(SD:12.97).

Jeeva *et al*, (2006) studied training needs and associated variables of fisheries officials of Kerala and Andhra Pradesh. They reported that training needs assessment is a pre-requisite to prepare a good training programme. Their study revealed that the training needs were comparatively higher among Kerala officials than the Andhra Pradesh in most of the subject areas of fishery technology and these differences were highly significant at 1 percent level. The major thrust areas

in which the fishery officials need training were identified. The major constraints reported by respondents were also listed.

Sanjeev and Singha (2010) studied training needs analysis of farmers of Arunachal Pradesh. They reported under each major component, specific and relevant training needs item were collected and systematically incorporated in to an interview schedule and administered in terms of frequency of training imparted. The results revealed that even in the most popular areas of training, there was an inadequacy. Farmers sought maximum trainings on Integrated farming systems, integrated pest and disease management and technologies for soil and water conservation. Nursery management topped the list under horticulture while training with respect to rearing of piggery was the most sought after one under animal sciences. Income generating activities for empowerment of rural women, formation and maintenance of SHGs and training on small scale processing and value addition were also in high demand. The KVKs must re-orient their trainings based on these findings to reduce the existing technological and adoption gap among the farmers in Arunachal Pradesh.

Patil and Kokate (2011) conducted study on training need assessment of subject matter specialist of Krishi Vigyan Kendras. They reported in western region of the Maharashtra state. The region consisting of ten districts, falls under the jurisdiction of Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri. Thus, the KVKs at Pune, Kolhapur, Solapur, Sangli, Satara, Ahmednagar, Nashik, Jalgaon, Dhule and Nandurbar were selected. All the SMSs of these KVKs were selected as respondents for present study. Questionnaire was used to elicit data from the respondents and collected information was subjected to appropriate statistical analysis. The study indicated 78.42 percent of overall training needs working in KVKs. Maximum training needs of SMS were observed towards agricultural engineering (82.71%), agricultural finance, marketing and exports (82.08%) and Integrated Nutrient Management (80.83%), Integrated Pest Management (80.33%), Extension Education (80.33%), Natural Resource Management

(78.75%), Horticultural Crop Production and Management (78.11%), Seed Production, Processing and Marketing (77.50%), Crop Husbandry (76.04%), and, Animal, Dairy, Veterinary and Fishery (75.06%). Fifty percent of SMSs preferred short duration and 65.00 percent of them demanded off campus and, both theory and practical oriented training programmes. In this direction ICAR Research Institutes, State Agricultural Universities and, National and Regional Level Extension Training Institutes need to take concrete efforts to organize need based training programmes for capacity building of KVK professionals.

Nongtdu *et al*, (2012) studied training needs of agricultural extension personnel of Meghalaya. They reported the important training need areas identified in order of importance are Soil Science, Entomology, Agronomy, Plant Pathology, Nematology and Horticulture. Correlation analysis has shown that age, service length, job performance and training exposure had a negative and significant correlation with training needs. Thus, variables like age, service length, job performance and training exposure could be considered while conducting training as these variables had significant correlation with the training needs of the respondents. As the training needs of extension personnel changed over time, training needs assessment should also be done on a regular basis and the important areas in which the extension personnel needs training should be considered while planning training for the extension personnel. Thus, appropriate measures should be taken by the department and other training institutions in addressing their grievances

Pagaria (2012) studied training needs of sheep husbandry of farm women in Barmer district. He reported that women need highest trainings in selection of sheep, management of sheep, health care, and cleaning and management of sheep. They preferred training of 2-3 days duration in their home village during the period January to April. Lack of time, inadequate compensation, venue and lack of awareness about training programmes were some of the constraints they faced in attending training courses. Therefore, training programmes may be arranged

and conducted based on the needs of the women to enhance their knowledge and confidence in sheep rearing.

Yadav *et al*, (2012) studied the training needs of extension officers about water shed management. They reported that majority of agricultural extension officers perceived medium to high training needs in the areas of monitoring and evaluation of watershed projects (90%), agro-ecosystem analysis & participatory rural appraisal technique (84.28%), engineering measures for arable & non-arable land systems (84.28%), soil survey & land capability classification (81.43%), agro forestry measures for arable & non-arable lands (78.57%) and efficient irrigation technology (65.71%). Livestock management, horticulture plantation and management techniques were also equally important areas of watershed development, where majority (67.14%) of the respondents expressed medium to high training needs. In the areas of soil management, majority of the respondents felt low to medium training needs. Overall, the majority of agricultural extension officers perceived moderate extent of training needs. Chi square analysis between selected independent variables such as age and educational qualification did not show any significant relationship while service experience showed significant association with overall extent of training needs. Conclusively, the study emphasizes an urgent need to update the knowledge and skill of agricultural extension functionaries by organizing need based skill oriented training programmes for effective transfer of technology to their clients for harnessing the full potential of the watershed management programmes

Chauhan and Kshirsagar, (2013) conducted the study on appraisal of training needs of members of tribal women SHGs for agricultural management. The study revealed reported that the 81 per cent of the respondents suggested providing on SHG concepts and linkage programme.

Patel *et al*, (2013), studied training needs of dairy farm women. Their study was conducted with the objectives to asses to the training need of the dairy

farm women. Based on the mean score obtained for various areas under study show that farmers have interest in training regarding breeding, fodder production where as they show less interest in animal care health practices as it is highly technical in nature and require expert advice.

Verma *et al*, (2013) conducted study on training need assessment of marigold growers. The study revealed that the first and foremost activity for planning a good training programme is to assess the training needs. The findings of the study revealed that most marigold growers have medium training needs.

Yadav *et al*, (2013) conducted the study on assessing the training needs agricultural extension workers about organic farming in North- Western Himalayas. They reported agricultural extension organizations worldwide face challenges of professional competence among their employees. Planning, training and management of human resources within extension organizations are essential to increase the capabilities and overall effectiveness of extension personnel. This paper examines the training needs of agricultural extension workers in the state of Himachal Pradesh, India, regarding organic farming. Random sampling was used to select 65 extension personnel of the Himachal Pradesh State Department of Agriculture (HPSDA) from within ten districts of the state. The data are self-reported scores collected with a structured instrument in which ten aspects of organic farming were addressed. The results revealed that the majority of extension workers reported medium to high training needs in seven specific areas: bio- dynamic farming, home farming, bio-rational pest management techniques, biological methods of pest control, bio-fertilizer technology, record keeping/certification standards, and grading/packing and marketing of organic produce. The majority of extension workers reported low or no training needs in the areas of composting/vermicomposting, green manuring/green leaf manuring, and crop rotations. There was no significant relationship between age, educational qualifications, or service experience with identified training needs. To achieve the potential for the uptake and successful implementation of organic farming

amongst Himachal Pradesh farmers, the training of HPSDA agricultural extension workers could concentrate on improving their knowledge in the seven identified areas of organic farming skills.

Pandya *et al*, (2014) studied assessment of training needs of farm women. They conducted their study in Rapar taluka of Kachchh district and the results revealed that majority of women belongs to middle age group of respondents were illiterate and dealing with the farm and animal husbandry as per their occupation. The majority of the farm women prefer to receive training on specific areas like profitable farming of field crops, family health and hygiene and storage of food grain and pulses.

Raina *et al*, (2014) studied training needs of potato growers towards improved technologies. They reported potato along with brinjal, tomato, cabbage and cauliflower account for nearly 60 percent of vegetable production in India. Potato is the most important crops in India in terms of 1863000 Ha acreage area and 42339000 MT production. Out of it, 15424 MT have been exported to different countries of the world. Commercial cultivation of potato is highly remunerative in such situation since it provides higher yield/ unit area and high economic return in short time. The sample consisted of 120 potato growers. The results revealed that a majority of farmers needed a medium to high level of training in areas like seed treatment, optimum dose of fertilizer, identification of insects/disease & their control measures, identification of weeds storage, proper use of rain water and marketing of storage

Patel *et al*, (2015) studied training needs assessment of visitor farmers of ATIC regarding groundnut production technology. The study was conducted in Banaskatha district and indicated that majority of groundnuts growers prefer to receive on diagnosis and control measures of diseases and pests. Among the respondent's education and social participation were significantly related with the training need of groundnut growers, occupation, and land holding irrigation

facilities and annual income were significantly related with training need of groundnut growers whereas age had negative and highly significant relationship with training need of groundnut growers.

Patel *et al*, (2015) studied training needs of tribal farmwomen in relation to agriculture and animal husbandry activities. The result of the study revealed that areas of training needs expressed by the tribal respondents in the field of agriculture were identification of common pest and disease and its control, method and time of fertilizer application, treatment of seeds, method of treatment, storage of food grains, preparation of farmyard manure, selection of seed, uprooting of the seedlings and distance of sowing in sequential order. It is also observed that areas of training needs expressed by respondents in the field of animal husbandry were awareness about primary treatment of common diseases, management of milch animals, planning of animal feed, storage and cultivation of fodder crops, importance of water of animals, preparation of good curd and ghee, symptoms of animals during heat, information about artificial insemination, care of cross bred cows, methods of milking in sequential order.

Patel *et al*, (2015) studied training needs assessment of castor growers. The results revealed that majority of castor growers prefer to receive training on control measures of diseases and pests followed by organic manures and application of manures and fertilizer. They can be concluded that castor growers of selected villages don't have knowledge and skill about the method of sowing.

Prajapati *et al*, (2015) conducted the study of training needs of tribal farmers in agriculture. The study was conducted in Banskantha district of Gujarat. This study concludes that maximum numbers of respondents have medium level adoption of recommended package of practice of major crops. Majority of respondents prefer to receive training on oil engine repairing and Micro irrigation systems followed by Seed production and Control measures of pests and diseases.

Manna *et al*, (2016) studied that does training need analysis help to minimize the competency gap. They reported that business sustainability can be best maintained with competent employees who support and effectively contribute towards achievement of organizational goal. Thus, competency gap of employees need immediate intervention through training. This study aims to develop a competency frame work for an operation department of an automobile parts manufacturing company. The competencies were mapped on the basis of skill relevance to perform a specific job in operation. Standard scoring was developed to evaluate four major competencies: behavioral, managerial, functional, and personnel of 37-line employees. The result indicated that there was a wide managerial competency gap and minor gaps in personnel competency. Immediate intervention for competency gap through training of the employees had helped the company to gain its competitiveness in defect-less production and enhancing service quality. The study was focused on a manufacturing unit only, whereas the research approach had huge scope to be implemented in service industries also. The paper is an original piece of study where a unique research approach has been applied to resolve training issues of manufacturing industries. The approach could be used for micro to large organizations

2.2 Work done abroad:

Cooke (1979) conducted the study on a model for the identification of training needs. The study concluded that on the job training is being used with greater frequency as a prevention and remedy for job related deficiencies, both in private industry and the public sector. The origins of this training are as varied as its application: some training is developed and presented informally by supervisors within small work units; some is undertaken by agency/company training officers with specific groups of employees; some is purchased from and presented by outside training consultants. Regardless of the origins of training, it represents an investment to the user in terms of development cost (time and monetary expenditure), and implementation cost (time of trainer and trainees,

monetary expenditure for material, transportation, etc.), As with any investment, one would like the assurance of knowing that the expenditure is reasonably well spent. The model is designed to help supervisors, managers, training officers and others identify the existence of performance discrepancies and match them with possible training remedies. The usefulness of the model is based on the premise that the best solutions to problems begin with an accurate description of the problem.

Anderson (1994) conducted a study on proactive model for training need analysis and the study revealed that competency based training is high on the industrial agenda of most countries at the moment and this requires that we go beyond thinking only in terms of task skills to consider the real elements which constitute occupational competence and effective work performance. Ways of assessing these competences and establishing career paths to enable people to improve their competency, and hence their quality of working life, need to be clearly identified. Ways of preparing people to meet the technological demands of the future need to go beyond the standard computer training courses we offer today and which we feel are sufficient. Continuous professional development, thus far restricted to a small number of upper echelon positions, will need to be considered for everyone in employment. A reactive, problem-based approach to needs analysis and HRD planning is no longer sufficient.

Despite the economic imperatives of contemporary organizational life, working in the training and HRD field involves more than the ability to turn a dollar. We are dealing with people and learning, with career goals and fears of the future. We need to challenge the idea that training exists solely for short-term economic reasons. The functional skills of a trainer or a human resource manager are as narrow as any other operator if they are not bedded in values, attitudes and ethics appropriate to a profession dealing with human beings as well as human resources.

Desombre *et al*, (1995) conducted the study on training need analysis within the community. They reported that a project was undertaken to provide a description of the training needs of agencies who are partners in the provision of care in the community. In developing the research strategy, a service design approach was adopted which complied with the design control requirement of the Quality Standard EN ISO 9001: 1994. A questionnaire for self-completion was sent to 25 individuals involved in delivering community care. The findings enabled priorities of joint training to be identified. The findings also enabled training to be suggested for both manager and direct care staff. Demonstrates the need for skill acquisition in a variety of areas. Generally, it was indicated by respondents that planning training arising from the project should be multidisciplinary. Enthusiasm for such training was also a feature of the respondents' responses

Bruke (1996) conducted the study on training needs at different organizational levels within a professional service firm. He reported States that owing to a vast change in commercial activity, organizational strategy and global competition, the skills need in the organization of the 1990s are quite different from those needed 20 years ago. In consequence, training needs have changed as well. Examines whether women and men at similar organizational levels report the same training needs; whether women and men at different organizational levels report similar or different training needs; and whether training needs reported by the most senior organizational level convey something about the culture or strategic direction of the organization.

Chiu *et al*, (1999) conducted the study on rethinking training need analysis. They reported that states owing to a vast change in commercial activity, organizational strategy and global competition, the skills need in the organization of the 1990s are quite different from those needed 20 years ago. In consequence, training needs have changed as well. Examines whether women and men at similar organizational levels report the same training needs; whether women and

men at different organizational levels report similar or different training needs; and whether training needs reported by the most senior organizational level convey something about the culture or strategic direction of the organization.

Leat and Lovell (1997) conducted the study on training need analysis, a weakness in conventional approach. They reported Preliminary study into the changing task roles of administrative support staff suggests that their training and development may be unduly and unhelpfully influenced by both management whim and by the flaws inherent in the application of conventional performance appraisal techniques. Drawing from a review of the literature, questions the reasons for undertaking performance appraisals and develop the argument that conventional appraisal methodology typically concentrates on the “summary” (or comparative) effectiveness of employees at the expense of meaningful diagnostic evaluation. Further suggests that in order to determine training and developmental needs effectively, techniques need to be devised which combine analysis at a number of different levels. Presents a conceptual model, and proposes behavioral expectation scales as tenable mechanisms for facilitating gainful diagnosis and constructive needs analysis.

Al Khayyat (1998) studied training and development needs assessment. He reported practical model of training and development needs assessment for partner institutes. A detailed description of the model’s components is presented with a suggested implementation sequence in order to successfully overcome obstacles. The literature revealed no solutions for the unique problems faced by partner institutes when conducting training needs assessment exercises. The proposed model is competency based, which allows for the incorporation of various data gathering techniques, the elimination of redundancies and role conflict, and therefore, the integration of the partner institute with member organization’s infra-structure to systematically and effectively assess the actual training and development needs of the industry to which they belong.

Eighteen (1999) conducted the study on training need analysis of IT training. He reported that Without appropriately educating staff about new technologies and what they can do for them, businesses will go on incurring the cost of software implementation without exploiting the benefits. Tailored training solutions are almost universally offered these days, but do companies really know what they are getting? What do we mean by “tailored training” anyway? How is the content of the training determined and will it suit each of those to be trained? Key Training have pioneered the creation and development of an automated Training Needs Analysis (TNA 2000) a tool used to establish the organizational, departmental and individual objectives of those to be trained.

Brown (2002) conducted a study on training needs assessment and the study revealed training needs assessment is an ongoing process of gathering data to determine what training needs exist so that training can be developed to help the organization accomplish its objectives. Conducting needs assessment is fundamental to the success of a training program. Often organizations will develop and implement training without first conducting a need analysis. These organization run the risk of overdoing training, doing too little training, or missing the point completely.

McClelland, (2002), attempted to assess the training needs of those nonprofit agencies receiving funding from the United Way of Dunn County. Interview questions were developed and administered to the agency directors face-to-face. A questionnaire was distributed to agency support staff and volunteers. Questions were designed to determine those common performance problems crossing agency lines that can be addressed by training. Not all performance problems can be addressed by training. In some cases, non-training interventions are necessary. By identifying performance problems that can be improved by training, the assessment will allow the agencies to focus on the real training needs within their organizations.

Clarke (2003) conducted the study on the politics of training need analysis. He reported that training need analysis refers to organizations data collection activities that underpin decision making activity particularly in relation to whether training can improve performance of those who receive training and training content. There are relatively few models to guide training practitioners and the models fail to fully capture the range of factors that affect the quality of the training decisions. These models are based upon the unitarist and rational view of organizational decision making, ignoring the extent to which the nature of social relationships and dynamics with organization may influence training related decisions. Supporting this proposition, the findings of the case study suggested that the organizational politics as a result of self-interest, conflict and power relations, influenced the validity of data provided by managers and subordinates during TNA. It presents a framework to assist practitioners in recognizing when and how organizational politics may affect TNA, and attempts to map the specific political dimension that impact the training decision, to guide future research in the area.

Gould *et al*, (2004) conducted the study on training need analysis: an evaluation framework. They reported that training needs analysis (TNA) is the first step in the training and educational strategy of an organisation and is crucial to meeting the continuing professional development needs of the healthcare workforce and service. TNA must be carefully planned, conducted and have clear outcomes to ensure that training interventions are implemented effectively and that they lead to meaningful changes in service delivery. However, there is a dearth of literature on approaches to critique TNA. This article describes a framework developed specifically to evaluate the effectiveness of TNA. The framework combines approaches that have been used to evaluate conventional research studies and audit.

Fan and Cheng (2006) studied the training needs of life insurance sales representatives In Taiwan using Delphi approach. They examined the

competencies needed by those sales representatives. A modified Delphi technique was used. Most life insurance companies in the USA implement an education and training plan advocated by the Life Office Management Association. Insurance companies in Taiwan implement similar education and training plans, but they do not seem to result in the successful performance of their sales representatives.

Besides augmenting knowledge of various financial products and marketing approaches, this study also suggests that life insurance companies need to train their sales representatives to an adequate standard in competencies of problem solving, communication, information technology utilization, culture compatibility, emotional intelligence, collective competence and ethic.

Reed and Vakola (2006) conducted the study on what role can a training needs analysis play in organizational change. They reported a number of key points emerged from the research: first, the culture and change issues arising during the development of the learning and development needs analysis process were very significant. Second, the development and piloting of the needs analysis process needed to be approached as a change management process. Third, linking the needs analysis process with existing organizational processes was a key factor in the success of the process and created a strategic dimension. Finally, in a large, complex organisation a balance must be struck between standardization and customization of the needs analysis process to allow for the different structures, subcultures and levels of readiness in the organisation. Their research also highlighted the significant impact the dynamics of hierarchy and the legacy of a bureaucratic, autocratic system has on the way a system operates and how people react to change and participation.

Oladoja *et al*, (2008) conducted the training needs of fisher folks on fishing technologies. Their study revealed that most of the respondents showed favorable attitude towards improved fishing production technologies in the study area. Major constraints experienced by the respondents are related to net fabrication and maintenance, improved smoking oven use, capital, construction of

simple gears, outboard engine repairs, unstable climate and tides, inaccessibility for spare parts of outboard engines, inadequate raw material for construction of simple gears and effective fishing processing and preservation techniques and gadgets.

Bowman and Wilson (2008), has studied different roles, different perspective and perception about the purpose of training needs analysis. The study aims to investigate the experiences of managers who underwent a training needs analysis (TNA) within a large bus transport company. It compares their perceptions of the TNA process with two external groups of training managers and training consultants. Recommendations are made to address and reconcile the differing interpretations and misunderstandings which occur between the different groups about TNA.

The approach uses qualitative grounded theory to identify the main perspectives about the purpose of training needs analysis. The findings are that business needs the main focus of the TNA. The various actors in the TNA process should be aware of their part in the process. Line managers should receive instruction in TNA. The article addresses the similarities and differences which are found among training managers, training consultants, and managers who were recipients of training needs analysis.

Ogunlade (2008) conducted the study on backyard fish farmers information needs in Osun state of Nigeria. He reported that the need for increase in fish production in order to improve protein intake by Nigerians led to this study. The study analyzed information needs of backyard fish farmers in Osun State, Nigeria. Specifically, the study investigated the socio-economic characteristics of backyard fish farmers, frequency of performance, importance and difficulties of management practices as well as the constraints facing backyard fish farming. Questionnaire was used to elicit information from 70

backyard fish farmers. The findings indicated that backyard fish farmers in Osun State were mostly males, middle aged, married and most of them rear catfish. Feeding and cleaning are frequently performed by the fish farmers, feeding and maintenance of water quality were of extreme importance and also cleaning and harvesting were found to be extremely difficult. The major constraints facing the fish farmers were capital, security, feed, fingerlings procurement. The paper concluded that backyard fish farmers need training on management practices.

Van Erede, (2008), studied the mediating role of training utility in the relationship between training needs assessment and organizational effectiveness. In a survey among respondents from 96 organizations, we found that the utility of training partially mediated the relationship between Training Needs Assessment (TNA) comprehensiveness and the effectiveness of the organization. We did not find an effect of training quantity on training utility and organization effectiveness. Both TNA comprehensiveness and training quantity were found to be unrelated to organizational size. The results support the importance of conducting TNA in practice.

Sanni *et al*, (2009) conducted the study on capacity building and training requirement for effective fisheries and aquaculture extension in Nigeria. They examined the importance of capacity building and training requirement for the benefit of fisheries and aquaculture extension in Nigeria. It involves the analysis of secondary data bothering on the management of agricultural extension in Nigeria over time vis-a-vis various agricultural development programmes in the past in which fisheries and aquaculture extension was apparently de-emphasized or neglected at the implementation phase. It is therefore recommended as a way forward towards actualizing the Unified Agricultural Extension System objective that a favorable reform in the Nigerian agricultural extension system will be a necessary avenue to put fisheries and aquaculture extension in proper perspective for effective service delivery which will be a good

entry point to achieving the millennium development goals of combating hunger, extreme poverty and attainment of food security in Nigeria.

Denby (2010) conducted the study on importance of training need analysis. He reported how carefully targeted training can improve productivity of UK insurance company, Moorhouse Group Ltd's sales team and increased the number of calls it handled by 56 percent. An explanation on the use of external consultants and how it helped Moorhouse Group Ltd to identify, design and deliver the training it needed. Details of sales training, and the workshops hosted for employees outside the sales area, helped to improve the company's capability to generate leads and convert sales. He explained how training can help to expand the range of skills available in the workforce as well as improve existing expertise. Individual action plans were created for people who attended the training and these action plans were handed back to managers to embed the learning into business.

Schwarz and Gibson, (2010), had studied a need assessment of aquaculture extension agents, specialists, and program administrators in extension programming. The study reported had identified continuing education and training needs of aquaculture extension agents, specialists, and program administrators in 10 competency areas relating to the need for continuing education or training. While most Extension professional and program administrators did not require significant training to accomplish their work, most agreed on the importance of continuing education in program evaluation, information technologies, and human development. This need varied by identified population dynamics.

Carislie *et al*, (2011) studied training needs of nurses in public hospitals in Australia. They reported an overview of the concept of training needs analysis (TNA), current practice, models and the impact that training needs analysis currently has on nurses in public hospitals in Australia. Thus, the paper should aid future research in the area of TNA of nurses through helping researchers to clarify the conceptual boundaries of training needs of nurses; providing a theoretical

framework that could help researchers in framing their research efforts in the area; and establishing a research agenda and identifying the impact this research will potentially have on Human Resource managers in hospitals across Australia. The specific contribution of the current study is in developing a logical model of TNA for nurses employed in healthcare organizations in Australia. In so doing insights are drawn from a number of discreet literature bases. Research in this area has been carried out primarily in the UK, USA and other countries. Unfortunately, TNA for nurses in Australia is very much an under-researched topic. Equally, there is scant research available into the importance and benefits of conducting appropriate TNA for nurses in Australia. The research that has been conducted involving training needs of nurses in Australia has not been focused on a TNA using a psychometrically valid tool, nor has the research considered the factors that may influence the training needs of particular nurses or organizations.

Iqbal and Khan (2011) conducted the study on growing concept and uses of training need assessment. They reported that the training needs assessment (TNA) with an objective to provide users/beneficiaries of TNA with the understanding of its growing concept, multiple uses (outcomes), and valuing these uses (antecedents). The study highlights training plans, goal setting, employee development, managing change, career development, knowledge, skills, and attitude, learning motivation, cost effectiveness, and performance appraisal as nine major human resource management and development areas revealing different uses of TNA. It gives an appropriate place to the expanding view of TNA. It offers important implications for human resource professionals. Their learning about multiple uses of TNA can help them attain comprehensive solutions of varied organizational problems and attempts to make a significant contribution towards understanding the growing concept of TNA by expanding the long-established way of looking at it through increasing its potential effects and subsequently enhancing its purposes and uses for both training and non-training initiatives.

Kshash (2011) studied the training needs of fish farmers in Babylon province. He reported that the success and the development of aquaculture projects Depends on the capabilities of fish farmers and the extent of their knowledge of the rules of fish farming. Training is an effective way to supply human resources with the knowledge, skills, capacity and trends needed to perform their work efficiently. The successful training is built on the basis of the training needs. The current study was conducted to identify the training needs of the fish farmers in Babylon province. Some fish farming practices, the study found that the respondents have a medium need for training, the field of fish diseases and their causes were most in need of training, there's a positive relation between the level of training needs and ponds area, and negative with years of experience, training courses and net profit.

Agbekpornu, (2012) conducted a study on the analysis of the training needs for the development of policy and planning for fisheries commission, Ghana. The study revealed that the training needs assessment is a process in gathering information about types of training needs of Fisheries commission, Ghana and to identify the gaps in the knowledge and to continue support by various means. Findings show that the identified knowledge and skill needed by the institution and the staff commission.

Salas, (2012), conducted a study on the science of training and development in in organizations in USA. The study revealed that Organizations in the United States alone spend billions on training each year. These training and development activities allow organizations to adapt, compete, excel, innovate, produce, be safe, improve service, and reach goals. Training has successfully been used to reduce errors in such high-risk settings as emergency rooms, aviation, and the military. However, training is also important in more conventional organizations. These organizations understand that training helps them to remain competitive by continually educating their workforce. They understand that investing in their employees yields greater results. However, training is not as intuitive as it may seem. There is a science of training that shows that there is a

right way and a wrong way to design, deliver, and implement a training program. The research on training clearly shows two things: (a) training works, and (b) the way training is designed, delivered, and implemented matters. This article aims to explain why training is important and how to use training appropriately. In particular, we argue that training is a systematic process, and we explain what matters before, during, and after training. Steps to take at each of these three- time periods are listed and described and are summarized in a checklist for ease of use.

Yeasmin *et al*, (2013) studied the training needs of fish farmers on integrated fish farming. The study was carried out to determine the extent of training needs of the fish farmers on integrated fish farming and to explore the relationship between the selected characteristics of the fish farmers and their extent of training needs on integrated fish farming (IFF). The „training needs for selection of diseases free seed and species ranked first followed by „training needs for ways of diseases control“. Sequentially „training needs for breed selection“ was third, „training needs for stocking density of fish species“ was fourth „training needs for preventive measures of diseases“ was fifth and „training need for techniques of egg collection“ was last in the rank order. The main problems on IFF were unavailability of quality seed and species, lack of financial support, lack of knowledge on species selection, lack of marketing facilities, lack of knowledge on fish processing and preservation. The extension service providers should arrange more training and motivational campaign for the fish farmers on IFF.

Belwal *et al*, (2014) conducted the study on training need assessment of fisherman in Oman through concept mapping technique. This study aims to assess the training needs of fishermen in Oman using the concept mapping technique. This study was the part of a larger research project on the training needs assessment(TNA), where a mixed method approach was used to identify the training needs. The study not only identified and evaluated the training needs but also observed the relevance of concept mapping technique. It was observed that the concept mapping technique struck a balance between the two extremes of

subjectivity and objectivity while identifying the training needs. The application of concept mapping technique can help in covering the concerns of multiple stake holders in TNA. It identifies some key training areas for Fishermen Training Institutions and government bodies in Oman. The research also supports the extension of the application of concept mapping technique to decision-making situations in other areas. Social implications – Training interventions based on the needs assessment will help fishermen from the Oman’s Batinah coast in gaining additional skills, expertise and income. This study applied the concept mapping technique in assessing the training needs of fishermen. The research also shares the outcomes of a pioneering attempt to identify fishermen’s training needs in Oman.

Saleh *et al*, (2016) conducted the study on training needs of agricultural extension officers in Iraq. They examined the training needs of extension agents in Iraq agriculture, specifically, the practice of different extension approaches, activities, methods and principal problems of extension agents in their fieldwork. Training in any form is intrinsic to organizational effectiveness and efficiency training. The type of training given to an individual who is gainfully employed but requires certain knowledge and skills to improve his efficiency. The purposes of this paper are 1) investigating the training needs for extension agents to perform their work effectively, 2) suggesting the suitable extension method for the present agricultural extension service in Iraq, and 3) identifying the primary functions and major problems of extension agents in Iraq 4) identifying the training needs in these studies. In-service training of the Extension Agents is the call of the time. Training needs were assessed using the Borich Needs Assessment Model, This Model is designed around the skills individuals and groups need to be effective in the future and are used for making human resources decisions. Through trained Agricultural Extension Agents new agricultural technology can easily and favorably be transferred to clientele. According to the centralized administration, the extension workers have been practicing mostly the training and visit system in

a top-down Iraq. Due to the non-involvement of local people in the extension program planning, implementation, and decision-making process, the extension service developed inefficiently. Therefore, the extension workers, researchers, and local farmers should cooperate in the extension work, especially in the planning, implementation, and evaluation of the extension program to develop the extension service in Iraq Agriculture. The local farmers should be involved in the decision-making process because they are really facing the problems in their field. All extension workers and subject matter specialists are now interested in implementing PEA in the future in the agricultural extension service.

Olorunfemi et al, (2017) studied the training needs of fish farmers on value addition initiatives in Kwara state of Nigeria. They reported that a purposive selection of two Local Government Areas each from the two Agricultural Development Programme administrative zones (Zones C and D) in Kwara State where fish farming is prominent and well-practiced was carried out. Forty fish farmers were then randomly selected from the fish farmers' association chapter present in each selected Local Government Area. Inter-view-schedule was used to elicit information from the respondents. The findings revealed that the fish farmers were economically active with a mean age of 42.5 years, majority (73.1%) were males, married (74.4%) and had one level of formal education or the other (82.5%). Chi-square analysis revealed a significant relationship between the respondents' training needs on value addition initiatives and their age, educational level, years of experience and fish farm income. The value addition initiatives use profile of the fish farmers was still very low among the respondents and training was highly needed on value addition initiatives in seven major areas. It was recommended that robust training programmes and advisory services should be packaged by extension organizations and other stakeholders for fish farmers in the major areas of capacity deficiencies indicated so as to enhance their use of value addition initiatives from production to marketing.

Chapter 3

MATERIAL AND METHODS

This chapter outlines the research design and methodology. It presents the study design, sample selection and size. The chapter also presents the study, methodology and data analysis. The research work on the topic “Assessment of Training Needs of Officials of J&K State Fisheries Department” was based on the field survey where primary data was collected from the fisheries inspectors and fisheries guards through well-structured pre- tested interview schedule.

Keeping in view the objectives under study, the appropriate method for the conduct of the study was finalized.

3.1 Research design employed.

3.2 Locale of the study.

3.3 Selection of Respondents.

3.4 Variables

3.5 Collection of data.

3.6 Statistical Analysis.

3.1 Research design employed.

Based on the objectives of the study ex-facto research design was adopted for the study. According to Kerlinger (1964), ex-facto research design is a systematic empirical inquiry in which the scientist does not have any control of influencing (independent) variables because their manifestations have already occurred or because they are inherently not manipulated. Inference about relations

among variables is made without direct intervention but from concomitant variation of independent and dependent variables.

3.2 Locale of the study.

The study was conducted in two districts of Kashmir i.e. Srinagar and Budgam.

Srinagar is the largest city and the summer capital of Jammu and Kashmir. It lies in the Kashmir valley on the banks of the Jhelum River, a tributary of the Indus, and Dal and Anchar lakes. It is situated at an altitude of 1585 meters above sea level between 34.0837° N Latitude and 74.7973° E. It is one of the several places that have been called the “Venice of the East” or “Kashmiri Venice”. The lakes around the city include Dal lake, Nigeen lake, Anchar lake and various sars include Khushal sar and Gilsar. The fish fauna of district Srinagar comprise of *Schizothorax niger* (Ale gad), *Schizothorax esocinus* (Churu), *S. plagiostomus* (Khont), *S. curvifrons* (Sattar gad) *Oncorhynchus mykiss* (Rainbow trout), *Salmo trutta fario* (Brown trout), *Glyptothorax kashmiriensis*, *Bangana diplostoma* (Raput), *Carassius carassius* (Gang gad), *Crossochelius diplochilus* (Tethur), *Triplophysa* spp. (Gurun), *Puntius conchoni* (Safaid bacha),

Cteopharyngdon idella (Grass carp), *Cyprinus carpio* var. *communis* (Scale carp), *Cyprinus carpio* var. *specularis* (Punjab gad)

Budgam is one of the youngest districts of the State, carved out as it was from the erstwhile District Srinagar in 1979. Situated at an average height of 5,281 feet above sea-level and at 75-degree E longitude and 34-degree N latitude, the district was known as *Deedmarbag* in ancient times. The district has only one sar and that is Hokersar. The fish fauna of the district includes *Schizothorax niger* (Ale gad), *Schizothorax esocinus*(Churu), *S. plagiostomus*, *S. curvifrons* (Sattar gad), *Carassius carassius* (Gang gad), *Crossochelius diplochilus* (Tethur),

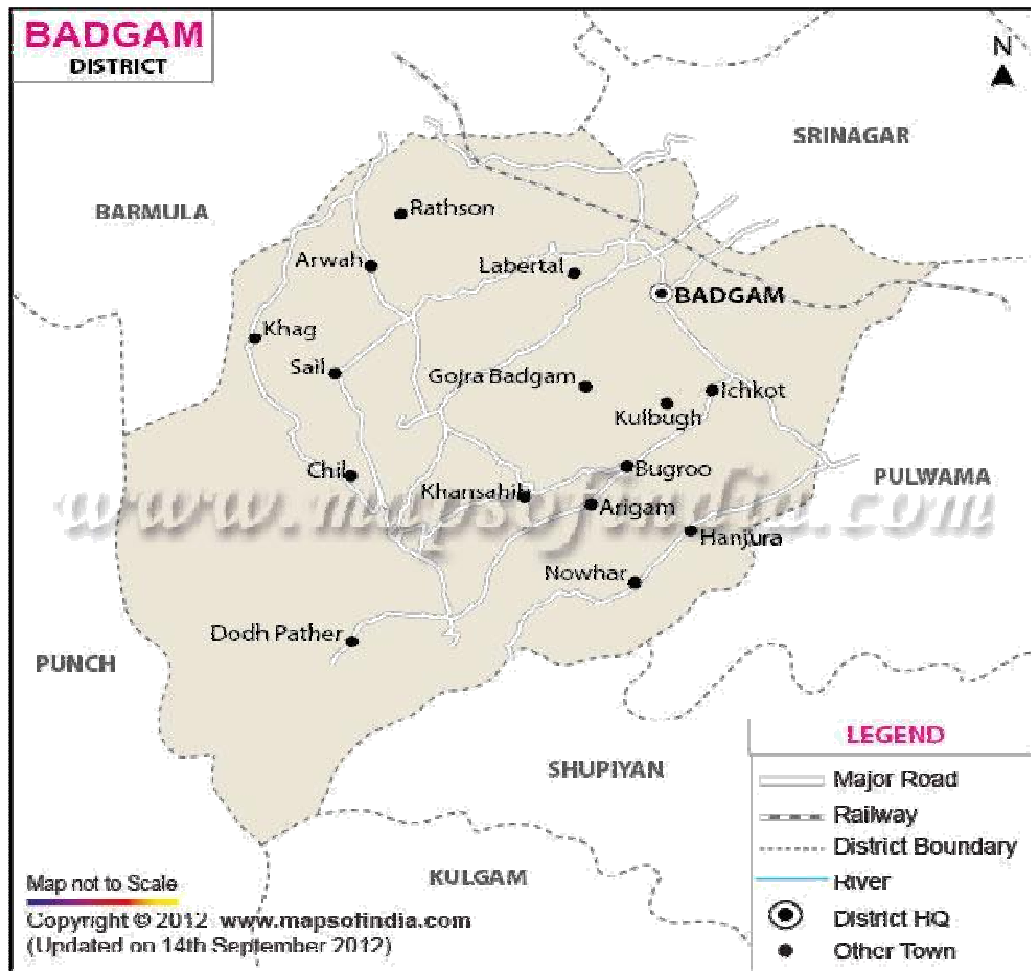


Plate 2 : Map of district Budgam

Triplophysa spp. (Gurun) and *Puntius conchoni* (Safaid bacha), *Cyprinus carpio* var. *communis* (Scale carp), *Cyprinus carpio* var. *specularis* (Punjab gad).

3.3 Selection of Respondents.

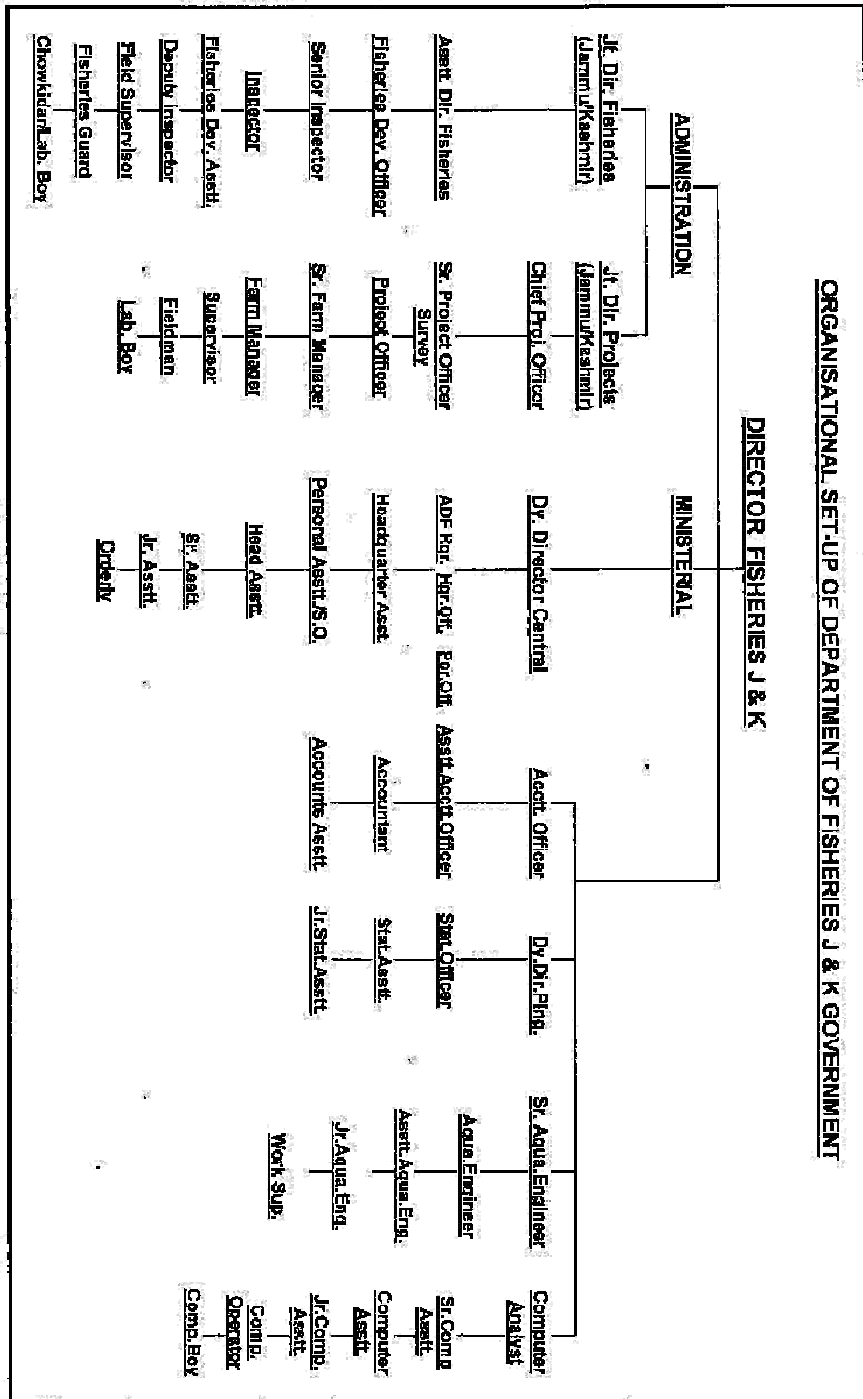
A list of fisheries inspectors and fisheries guards of Srinagar (66) and Budgam (44) was procured from the district headquarters of the state fisheries department. The sample of the study constituted whole population of the fisheries officials. Thus, the sample selection was done through purposive selection method.

In the department of fisheries, officials of fisheries inspector rank work at the grass root level. These officials act as a connecting link between the farmers and the department. As the fisheries inspectors look after the breeding, feeding, brood stock at the farm, therefore, it becomes mandatory for them to be knowledgeable regarding the above activities so that they will disseminate the knowledge and the skill to the fish farmers.

As fisheries guards remain in immediate contact with the fishers. They should also have good knowledge about the sustainable fisheries including fisheries legislation and the conservation of the water bodies, so that they can upgrade the knowledge of the fishers regarding the same.

The present study was designed to know the knowledge level of fisheries inspectors and the fisheries guards. The gap in their knowledge level helped in identifying the areas in which the training should be imparted. Training program formulated without identifying the knowledge gaps lead to wastage of resources as well as time. The results of the study helped in finding the knowledge gaps and thereby formulation of need based training programs leading to the enhancement of knowledge and skills of selected fisheries officials and ultimately that of fish farmers and fishers.

The herichial setup of the fisheries department is as follows:



3.4 Variables

3.4.1 Independent variable

The independent variables in the study is education, age and experience.

3.4.1.1 Age

Age was operationalized as the no of years completed by the respondent at the time of investigation. The age of respondent in completed years was considered for the purpose of analysis. The respondents were also categorized into three groups as detailed below for use in descriptive analysis of data.

Classification	Age group
18-35	Young
35-50	Middle
>50	Old

3.4.1.2 Education

This was operationally defined as the number of years of formal education acquired by a respondent. Education of a respondent was quantified using procedure followed similarly to Sundaraswamy (1987). One score was assigned according to educational level of respondents classified into 5 categories for studying their characteristics. The respondents were classified into 5 groups of educational level as detailed above, for analyzing the characteristics of respondents.

Categories	Scores
Middle	1
Under Matric	2
Matric	3
12 th	4
Graduate	5

3.4.1.3 Experience

Experience is the mastery of an event or subject gained through involvement in or exposure to it. The concept of experience generally refers to know-how or procedural knowledge, rather than propositional knowledge: on-the-job training rather than book-learning. This is operational as it defines the number of years completed by the respondent in service at the time of investigation. The experience gained in years was considered for the purpose of analysis. The experience was quantified by assigning scores as detailed below:

Categories	Scores
Upto 10	1
11 – 20	2
21- 30	3
31 – 40	4

3.4.2 Dependent variable:

The dependent variable in the study is job type

3.4.2.1 Job type

Job consists of duties, responsibilities, and tasks (performance elements) that are (1) defined and specific, and (2) can be accomplished, quantified, measured, and rated. This determines the regular work that a person does to earn money. The job type of respondents was quantified by assigning scores as detailed below:

Categories	Scores
Fisheries Inspectors	1
Fisheries Guards	2

3.5 Collection of data

A well- structured interview schedule, formulated after keeping in view the objectives of the study, and in consultation with the subject matter specialists from the faculty of fisheries was used for conducting the survey. The schedule is presented in Appendix- I and Appendix – II. The interview schedule 1 was divided into four sections. Section one included question related to demographic data while as section II, III, IV was having questions pertaining to aquaculture, water chemistry and fish health and diseases respectively. Interview schedule II was having two section one for demographic data and section II for question related to capture fisheries. The schedule was pre-tested and necessary changes were made and included in the final schedule. The survey was conducted during the period of spring in 2017. Apart from the survey group discussion were also

conducted. The personal interview methods were used to collect the data from the respondents. The responses of the respondents were recorded on the schedule.

3.6 Statistical analysis

The statistical analysis of the data was carried out by using Microsoft Excel and SPSS v 16.0 and Past3 software used. Percentage analysis was used to analyze the personal and the knowledge characteristics of the respondents like education, age, experience, job type, knowledge level to assess the training needs of the respondents.

Chapter 4

EXPERIMENTAL FINDINGS

The findings of the study have been presented in the current chapter. The interviews were held during the Spring 2017 and responses obtained are compiled under different headings. A total of 100 interviews were undertaken with the member of two separate sample groups- Group I constituted fisheries inspectors and Group II fisheries guards as shown in the table 4.1. The data presented is collectively based on the responses of different groups and the further analyzed and discussed.

Table 4.1 Name of the sample group and sample size

Name of the sample group	Number of respondents
Group one: Fisheries Inspectors	11
Group two: Fisheries Guards	89
Total	100

4.1 Data presentation.

The two interview schedules were formulated for the research study. The interview schedule 1 was constituted for fisheries inspectors. This schedule was divided in the four sections. Each section comprised of question pertaining to various subject matter areas of fisheries. Ist section included demographic data of respondents, IInd, IIIrd and IVth sections comprised of questions pertaining to aquaculture, water chemistry and fish health and diseases respectively. The interview schedule II was constituted for fisheries guards. This schedule was in divided two sections. Section I comprised questions pertaining demographic data and section II capture fisheries. The chapter further discusses the data exactly found in the interview schedules under the above-mentioned headings

4.2 Knowledge level

Knowledge may be defined as the fact or condition of knowing something with familiarity gained through experience and association (Merriam-Webster). The knowledge level of the respondents was assessed after the analysis of data and their knowledge was divided into three groups viz low, medium and high. The respondents were categorized into three groups based on their knowledge level. Those respondents replying 71-100% questions correctly were put into high knowledge level, 36-70% were categorized into medium and below 35% into low. The grouping of knowledge level is shown in table 4.2.

Table 4.2: Level of knowledge

Level of knowledge	Percentage Analysis
High	71-100
Medium	36-70
Low	10-35

4.3. Presentation of data from interview schedule I (Fisheries Inspectors).

The sample group one constitutes eleven (11) fisheries inspectors. Six (6) from District Srinagar and five (5) Budgam. Fisheries inspectors of the two districts were contacted and interviewed in order to collect the primary data.

4.3.1 Section I: Demography.

4.3.1 (a): Age

Table 1 highlights the age group of the respondent officials of state fisheries department. It can be observed from the table that 72.73% of fisheries inspectors were above 50 years and 27.27% were middle aged (35-50 years).

Table 3.1(a): Age group of the respondent fisheries officials n = 11

S. No	Age group	Fisheries Inspectors	
		No.	%
1.	18-35	0	0
2.	35-50	3	27.27
3.	>50	8	72.73
Total		11	100

4.3.1(b) Education status.

It can be revealed from the Table 3.1(b) maximum officials i.e. (63.64%) were graduates. While 18.18 % were post graduates and only 18.18% of fisheries inspector had education upto matric.

Table 3.1(b): Education status of the respondent fisheries officials n=11

S. No	Education status	Fisheries Inspectors	
		No.	%
1.	Matric	2	18.18
2.	Graduated	7	63.64
3.	Post- graduate	2	18.18
Total		11	100

4.3.1(c) Sex

It is observed from the Table 3.1(c) that majority (90.91%) of respondents were males and only 9.09% were females.

Table 3.1(c): Sex of the respondent fisheries officials n=11

S. No	Sex	Fisheries Inspectors	
		No.	%
1.	Male	10	90.91
2.	Female	1	9.09
Total		11	100

4.3.1(d) Experience

Table 4.3.1(d) reveals the experience of the respondent officials. It can be seen that 45.46% of fisheries inspectors had experience of 10-20 years, 27.27% had experience of 21-30 years followed by 18.18% having experience of 31.-40 years. Only 9.09% had experience upto 10 years.

Table 3.1(d): Experience of the respondent fisheries officials
n=11

S. No	Experience	Fisheries Inspectors	
		No.	%
1.	Upto 10	1	9.09
2.	10-20	5	45.46
3.	21-30	3	27.27
4.	31-40	2	18.18
Total		11	100

4.3.1(e) Place of posting

Table 3.1(e) depicts the number of respondent officials in two districts. It can be viewed from the table that 54.55% of fisheries inspectors were posted in district Srinagar and 45.45% district Budgam.

Table 3.1(e): Place of posting of the respondent fisheries officials
n=11

S. No	Place of posting	Fisheries Inspectors	
		No.	%
1.	Srinagar	6	54.55
2.	Budgam	5	45.45
Total		11	100

4.3.2 Section II: Knowledge of Fisheries Inspectors pertaining to various aquaculture practices

The questions pertaining to aquaculture were asked to fisheries inspectors. The response recorded on the interview schedule is presented in the form of tables in this section.

4.3.2(a) Knowledge regarding most suited soil for site selection.

Table 3.2(a) represents the knowledge of fisheries inspectors regarding most suited soil for site selection. It is seen that only 27.27% of the officials were aware about it.

**Table 3.2(a): Knowledge regarding most suited soil for site selection.
n=11**

S. No	Most suited soil for site selection	Fisheries Inspectors	
		No.	%
1.	Sandy	1	9.09
2.	Clayey	0	0
3.	Loamy	7	63.64
4.	Clayey loamy	3	27.27
Total		11	100

4.3.2(b) Knowledge regarding the required pH of the soil at the pond bottom.

Table 3.2(b) highlights the knowledge of fisheries inspectors regarding the pH of soil at pond bottom. It is evident from the table that 45.45% gave the correct answer.

Table 3.2(b): Knowledge regarding required pH of the soil at pond bottom
n=11

S. No	Required pH of the soil at pond bottom	Fisheries Inspectors	
		No.	%
1.	9	0	0
2.	6.5-7.5	5	45.45
3.	7	6	54.55
4.	Below 5	0	0
Total		11	100

4.3.2. (c) Knowledge regarding the structure of the pond.

Table 3.2(c) reveals the knowledge of fisheries inspectors regarding the structure of the pond. It can be concluded from the table that majority (90%) of the officials answered correctly about the structure of the pond.

Table 3.2(c): Knowledge regarding structure of the pond n=11

S. No	Required pH of the soil at pond bottom	Fisheries Inspectors	
		No.	%
1.	Square	1	10
2.	Rectangular	10	90
3.	Trapezoid	0	0
4.	None of the above	0	0
Total		11	100

4.3.2(d) Knowledge regarding required size of pond.

Table 3.2(d) reveals the knowledge of fisheries inspectors regarding the size of the pond. It is apparent from the table that 63.64% were able to answer correctly.

Table 3.2(d): Knowledge regarding required size of the pond
n=11

S. No	Required size of the pond	Fisheries Inspectors	
		No.	%
1.	Upto 0.1 hectares	1	9.09
2.	0.1-0.2 hectares	7	63.64
3.	0.2-0.3 hectares	2	18.18
4.	0.3-0.4 hectares	1	9.09
Total		11	100

4.3.2(e) Knowledge regarding average depth of the pond.

Table 3.2(e) reveals the knowledge of fisheries inspectors regarding the average depth of the pond. It is evident from table that 90% gave correct answer whereas 10% of respondents gave incorrect reply.

Table 3.2(e): Knowledge regarding average depth of the pond
n=11

S. No	Average depth of the pond	Fisheries Inspectors	
		No.	%
1.	0-2 mtrs	0	0
2.	2-3mtrs	10	90
3.	4-5mtrs	1	10
4.	2-4mtrs	0	0
Total		11	100

4.3.2(f) Knowledge regarding required dosage for manuring of the nursery pond.

Table 3.2(f) highlights the knowledge of fisheries inspectors regarding required dosage for manuring of the nursery ponds. It can be seen from the table that 81.82% of officials gave the correct reply.

Table 3.2(f): Knowledge regarding required dosage for the manuring of the nursery ponds.

n=11

S. No	Required dosage for the manuring of the nursery ponds	Fisheries Inspectors	
		No.	%
1.	5000 to 10000kg RCD or 250 super phosphate	9	81.82
2.	10000 to 15000kg RCD or 250 super phosphate	2	18.18
3.	15000 to 20000kg RCD or 250 super phosphate	0	0
4.	20000 to 25000kg RCD or 250 super phosphate	0	0
Total		11	100

4.3.2(g) Knowledge regarding dosage for liming of nursery ponds.

Table 3.2 (g) reveals the knowledge of fisheries inspectors regarding dosage for liming of nursery ponds. It is seen from the table that 73.73% of officials know about it.

Table 3.2 (g): Knowledge regarding required dosage for liming of the nursery ponds.

n=11

S. No	Required dosage for liming of the nursery ponds	Fisheries Inspectors	
		No.	%
1.	25 kg/ha daily	0	0
2.	50 kg/ha daily	3	27.27
3.	50kg/ ha weekly	8	73.73
4.	75 kg/ ha weekly	0	0
Total		11	100

4.3.2(h) Knowledge regarding color of the water in productive nursey ponds.

Table 3.2(h) shows the knowledge of fisheries inspectors regarding the color of the water in productive nursery ponds. It is seen from the table that 100% of the officials gave correct answer to the question regarding it.

Table 3.2(h): Knowledge regarding color of the water in productive nursery ponds.

n=11

S. No	Color of the water in productive nursey ponds	Fisheries Inspectors	
		No.	%
1.	Blue	0	0
2.	Green	11	100
3.	Colorless	0	0
4.	Muddy	0	0
Total		11	100

4.3.2 (i) Knowledge regarding dosage for manuring of the grow-out ponds.

From the Table 3.2(i) the knowledge level of fisheries inspectors regarding manure dosage. It is observed from the table only 36.36% of the officials gave the correct answer regarding whereas rest of employees replied incorrectly.

Table 3.2 (i): Knowledge regarding dosage for the manuring of the grow-out ponds.

n=11

S. No	Required dosage for the manuring of the grow-out ponds	Fisheries Inspectors	
		No.	%
1.	7000 to 8000 kg RCD or 250 super phosphate	4	36.36
2.	10000 to 15000 kg RCD or 250 super phosphate	6	54.55
3.	15000 to 20000 RCD or 250 super phosphate	0	0
4.	20000 to 25000 RCD or 250 super phosphate	1	9.09
Total		11	100

4.3.2 (j) Knowledge regarding number of ponds constructed in extensive systems.

From the table 3.2 (j) present assessment of knowledge regarding number of ponds constructed in extensive system of fisheries inspectors. It can be viewed from the table that 36.36% of officials knew the correct answer.

Table 3.2 (j): Knowledge regarding number of ponds constructed in extensive system.

n=11

S. No	Number of ponds constructed in extensive system	Fisheries Inspectors	
		No.	%
1.	One	4	36.36
2.	Two	4	36.36
3.	Three	2	18.18
4.	Four	1	9.09
Total		11	100

4.3.2 (k) Knowledge regarding culture duration in the semi intensive level.

Table 3.2 (k) presents knowledge regarding culture duration in semi-intensive level. It can be seen from the table that only 36.36% of respondents knew the correct answer while the rest gave wrong responses.

Table 3.2 (k): Knowledge regarding culture duration in the semi intensive level.

n=11

S. No	Culture duration in the semi intensive level	Fisheries Inspectors	
		No.	%
1.	12 months	6	54.55
2.	10 months	4	36.36
3.	6 months	1	9.09
4.	4 months	0	0
Total		11	100

4.3.2 (l) Knowledge regarding rate of stocking in intensive level.

From the Table 3.2 (l) knowledge of fisheries inspectors regarding rate of stocking in intensive level is assessed. It is evident from the table that the 81.82% of officials were able to answer the question correctly.

Table 3.2 (l): Knowledge regarding rate of stocking in intensive level.
n=11

S. No	Rate of stocking in intensive level.	Fisheries Inspectors	
		No.	%
1.	20000 fry	0	0
2.	23000 fry	1	9.09
3.	25000 fry	9	81.82
4.	27000 fry	1	9.09
Total		11	100

4.3.2 (m) Knowledge regarding higher survival rate in aquaculture system.

From the table knowledge regarding higher survival rate in aquaculture system is assessed. It is clear from the table that only (9%) of the officials were able to answer it correctly.

Table 3.2 (m): Knowledge regarding higher survival rate in aquaculture system

n=11

S. No	Higher survival rate in aquaculture system	Fisheries Inspectors	
		No.	%
1.	Extensive	7	63.64
2.	Semi-intensive	2	18.18
3.	Intensive	1	9
4.	Super-intensive	1	9.09
Total		11	100

4.3.2 (n) Knowledge regarding system of aquaculture yielding more crop.

Table 3.2 (n) highlights the knowledge regarding system of aquaculture yielding more crop. It is clear from the table that 27.27% of officials were able to answer it correctly.

Table 3.2 (n): Knowledge regarding system of aquaculture yielding more crop

n=11

S. No	System of aquaculture yielding more crop	Fisheries Inspectors	
		No.	%
1.	Super-intensive	3	27.27
2.	Extensive	4	36.36
3.	Semi-intensive	1	9.09
4.	Intensive	3	27.27
Total		11	100

4.3.2(o) Knowledge regarding size of brood stock rearing raceways of trout.

Table 3.2 (o) gives the observation about knowledge of fisheries inspectors regarding size of brood stock rearing raceways of trout. It can be seen from the table that 54.55% of the officials gave correct answer.

Table 3.2 (o): Knowledge regarding size of brood stock rearing raceways of trout

n=11

S. No	Size of brood stock rearing raceways of trout	Fisheries Inspectors	
		No.	%
1.	10m×1m×7m	3	27.27
2.	20m×2m×1m	6	54.55
3.	15m×2m×1m	0	0
4.	None of above	2	18.18
Total		11	100

4.3.2 (p) Knowledge regarding stocking density of brood stock rearing raceways of trout.

Table 3.2 (p) represents the knowledge of fisheries inspectors regarding stocking density of brood stock rearing raceways of trout. The table shows that the majority (90.91%) of officials gave correct answer.

Table 3.2 (p): Knowledge regarding stocking density of brood stock rearing raceways of trout.

n=11

S. No	Stocking density of brood stock rearing raceways of trout.	Fisheries Inspectors	
		No.	%
1.	20-40kg/m ³	0	0
2.	30-40kg/m ³	10	90.91
3.	5-30kg/m ³	1	9.09
4.	10-20kg/m ³	0	0
Total		11	100

4.3.2 (q) Knowledge regarding average temperature in the brood stock rearing of trout.

Table 3.2 (q) highlights the knowledge of fisheries inspectors regarding average temperature in the brood stock rearing of trout. It is clear from the table that only 18.18% of officials were able to answer it correctly.

Table 3.2 (q): Knowledge regarding average temperature in the brood stock rearing raceways of trout.

n=11

S. No	Average temperature in the brood stock rearing raceways of trout.	Fisheries Inspectors	
		No.	%
1.	10-20 ^o C	7	63.64
2.	10-14 ^o C	2	18.18
3.	8-10 ^o C	1	9.09
4.	8-15 ^o C	1	9.09
Total		11	100

4.3.2 (r) Knowledge regarding minimum weight of the brood stock of trout.

From the Table 3.2 (r) knowledge level of fisheries inspectors regarding minimum weight of brood stock is assessed. It is evident from the table that only (9.09%) of respondent officials gave the correct answer.

Table 3.2 (r): Knowledge regarding minimum weight of the brood stock of trout.

n=11

S. No	Minimum weight of the brood stock of trout.	Fisheries Inspectors	
		No.	%
1.	500 gms	7	63.64
2.	400 gms	1	9.09
3.	600 gms	2	18.18
4.	700 gms	1	9.09
Total		11	100

4. 3.2 (s): Knowledge about number of eggs placed in hatching tray.

From the Table 3.2 (s) it can be concluded that 72.73% of fisheries inspectors gave the correct answer to the question.

Table 3.2 (s): Knowledge about number of eggs placed in hatching tray.

n=11

S. No	Number of eggs placed in hatching tray	Fisheries Inspectors	
		No.	%
1.	7000-10000 eggs/tray	8	72.73
2.	5000-6000 eggs/tray	3	27.27
3.	1000-4000 eggs/tray	0	0
4.	2000-5000 eggs/tray	0	0
Total		11	100

4.3.2(t): Knowledge about number of days in which eyed ova stage is reached

From the Table 4.3.2 (t) it is evident that 72.73% of respondent officials gave the correct answer when asked about the number of days eyed ova stage is reached.

Table 3.2 (t): Knowledge about number of days in which eyed ova stage is reached

n=11

S. No	Number of days in which eyed ova stage is reached	Fisheries Inspectors	
		No.	%
1.	10 days	0	0
2.	15 days	2	18.18
3.	20 days	1	9.09
4.	21 days	8	72.73
Total		11	100

4.3.2 (u): Knowledge about number of days in which eyed ova changes to Alevin stage.

From the Table 3.2 (u) highlights the knowledge of fisheries inspectors regarding number of days eyed ova changes to alevin stage. The table shows the only 18.18% of respondent officials gave correct answer when asked about it.

Table 3.2 (u): Knowledge about number of days in which eyed ova changes to Alevin stage.

n=11

S. No	Number of days in which eyed ova changes to Alevin stage.	Fisheries Inspectors	
		No.	%
1.	10 days	1	9.09
2.	15 days	7	63.64
3.	11 days	2	18.18
4.	14 days	1	9.09
Total		11	100

4.3.2 (v) Knowledge about number of raceways in trout hatchery.

From the Table 3.2(v) it can be concluded only 9.09% knew the correct answer when asked number of raceways in trout hatchery.

Table 3.2 (v): Knowledge about number of raceways in trout hatchery
n=11

S. No	Number of raceways in trout hatchery	Fisheries Inspectors	
		No.	%
1.	3	1	9.09
2.	4	1	9.09
3.	6	7	63.64
4.	5	2	18.18
Total		11	100

4.3.2 (w) Knowledge about purpose of liming, levels of culture system, size of hatching tray

Table 3.2 (w) highlights the knowledge of fisheries inspectors regarding liming, levels of culture system and size of hatching tray. 100% of respondent officials gave correct answer when asked about purpose of liming. 54.55% of respondent officials gave correct answer when asked about different levels of culture system. 36.33% of respondent officials gave correct answer when asked about the size of the hatching tray.

Table 3.2 (w) Knowledge about purpose of liming, levels of culture system, size of hatching tray

n=11

S. No	Statement Asked	Fisheries Inspectors	
		Correct response frequency	Correct Response %
1.	Purpose of liming	11	100
2.	Different levels of culture system	6	54.55
3.	Size of the hatching tray	4	36.33

4.3.2 (x) Overall knowledge of Fisheries Inspectors regarding aquaculture.

Many of the fisheries inspectors gave the correct reply to 36-70% of questions pertaining to aquaculture, so they fall in the medium knowledge level.

Table 3.2 (x) Overall knowledge in Aquaculture
n=11

S. No	Knowledge level	Frequency
1.	High	0
2.	Medium	10
3.	Low	1

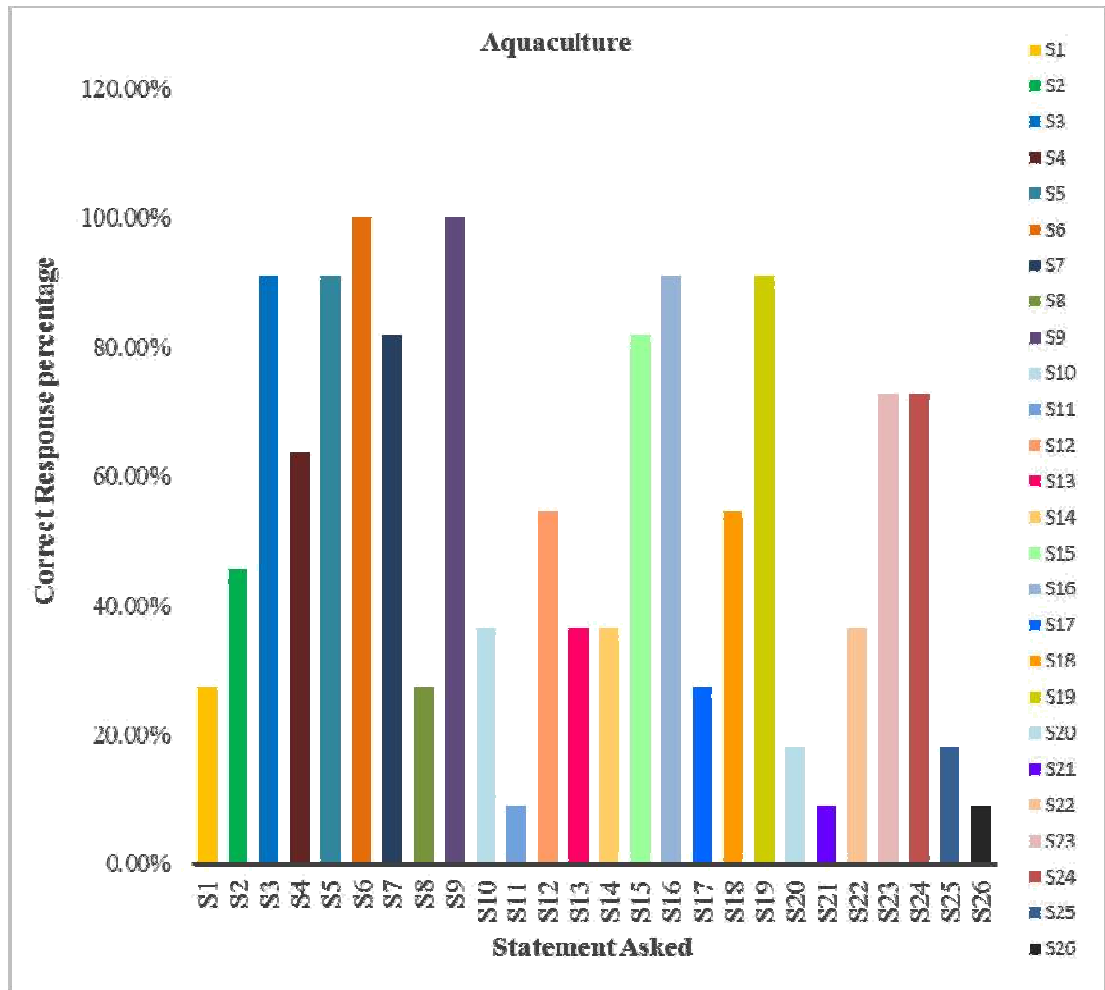


Figure 1: Correct response percentage in Aquaculture

Correct response percentage in Aquaculture

S. No	Statement Asked
S1	Most suited soil for site selection
S2	Required pH of the soil at the pond bottom
S3	Structure of the pond
S4	Required size of the ponds
S5	Average depth of the pond
S6	Purpose of liming
S7	Required dosage for the manuring of the nursery pond
S8	Required dosage for the liming of the nursery pond
S9	Color of water in the productive nursery pond
S10	Required dosage of manures in the grow out ponds
S11	Required dosage of liming in the growout ponds
S12	Different levels of culture systems
S13	Number of ponds constructed in the extensive system
S14	Culture duration in the semi- intensive level
S15	Rate of stocking in the intensive level
S16	Highest rate of survival in aquaculture system
S17	System of aquaculture yielding more crop

4.3.3 Section III: Knowledge level of fisheries inspectors about water chemistry.

Fisheries Inspectors were asked regarding water chemistry and replies were recorded on interview schedules. The data assessed is as follows:

4.3.3 (a): Knowledge about ideal temperature of water in productive fish pond

From the Table 3.3 (a) it is revealed that only 18.18% of fisheries inspectors knew about ideal temperature of water in productive fish pond.

Table 3.3 (a): Knowledge about ideal temperature of water in productive fish pond

n=11

S. No	Ideal temperature of water in productive fish pond.	Fisheries Inspectors	
		No.	%
1.	Between 15 and 35 ^o C	2	18.18
2.	Between 10 and 20 ^o C	2	18.18
3.	Between 20 and 30 ^o C	7	63.64
4.	Between 10 and 35 ^o C	0	0
Total		11	100

4.3.3 (b): Knowledge about required turbidity level of the fish pond.

Table 3.3 (b) gives the knowledge of fisheries inspectors regarding required turbidity level in fish pond. From the table it is indicated that 81.82% of respondent officials were able to answer this question correctly.

Table 3.3 (b): Knowledge about required turbidity level of the fish pond.
n=11

S. No	Required turbidity level of the fish pond.	Fisheries Inspectors	
		No.	%
1.	Below 20 ppm	9	81.82
2.	Above 20 ppm	1	9.09
3.	20-25ppm	1	9.09
4.	25-30 ppm	0	0
Total		11	100

4. 3.3 (c): Knowledge about required pH of the water in the productive waters.

Table 3.3 (c) highlights the knowledge of fisheries inspectors regarding pH of productive waters. From the table it can be concluded that 18.2% of respondent officials gave correct answer to the question asked about it.

Table 3.3 (c): Knowledge about required pH of the water in the productive waters.

n=11

S. No	Required pH of the water in the productive waters.	Fisheries Inspectors	
		No.	%
1.	7-8	2	18.2
2.	6-9	2	18.2
3.	Below 6	7	63.64
4.	Above 9	0	0
Total		11	100

4. 3.3 (d): Knowledge about ideal DO level in the productive fish pond

Table 3.3 (d) presents the knowledge of fisheries inspectors regarding ideal DO level in the productive fish pond. It is evident from the table that 36.36% of respondent officials gave the correct answer regarding it.

Table 3.3 (d): Knowledge about ideal DO level in the productive fish pond
n=11

S. No	Ideal DO level in the productive fish pond	Fisheries Inspectors	
		No.	%
1.	4 to 8 ppm	4	36.36
2.	2 to 4 ppm	1	9.09
3.	5 to 10 ppm	4	36.37
4.	7 to 14 ppm	2	18.18
Total		11	100

4.3.3 (e): Knowledge about required ammonia level in the productive fish pond.

Table 3.3(e) depicts knowledge of fisheries inspectors regarding required ammonia level in productive fish pond. It is apparent from the table that only 18.18% of respondent officials gave the correct answer regarding it.

Table 3.3 (e): Knowledge about required ammonia level in the productive fish pond

n=11

S. No	Required ammonia level in the productive fish pond.	Fisheries Inspectors	
		No.	%
1.	More than 5 ppm	1	9.09
2.	Less than 1 ppm	1	9.09
3.	1 to 3 ppm	7	63.64
4.	More than 1 ppm	2	18.18
Total		11	100

4.3.3 (f): Knowledge about treatment in case of increase in acidity of pond.

Table 3.3(f) gives the knowledge of fisheries inspectors regarding treatment to be followed in case of increase in acidity of ponds. It can be concluded from the table that 63.64% of respondent officials gave the correct answer about treatment followed in this case.

Table 3.3 (f): Knowledge about treatment in case acidity of pond increases
n=11

S. No	If the acidity of pond increases	Fisheries Inspectors	
		No.	%
1.	Liming	7	63.64
2.	Addition of water	1	9.09
3.	Replenishing water	2	18.18
4.	Do not know	1	9.09
Total		11	100

4.3.3 (g): Knowledge about required phosphate level in the fish pond.

From the Table 3.3 (g) highlights knowledge level of fisheries inspectors, regarding the required phosphate level in the fish pond. 54.55% of officials gave correct answer regarding it.

Table 3.3 (g): Knowledge about required phosphate level in the fish pond.
n=11

S. No	Required phosphate level in the fish pond.	Fisheries Inspectors	
		No.	%
1.	0.2 to 0.5 ppm	6	54.55
2.	0.1 to 0.2 ppm	1	9.09
3.	Above 0.5 ppm	2	18.18
4.	Below 0.1 ppm	2	18.18
Total		11	100

4. 3.3 (h): Knowledge about required nitrate level in the pond water.

Table 3.3(h) shows knowledge of fisheries inspectors regarding required nitrate level in productive fish pond. It is apparent from the table that only (18.18%) of respondent officials gave the correct answer regarding it.

Table 3.3 (h): Knowledge about required nitrate level in the pond water.
n=11

S. No	Required ammonia level in the productive fish pond.	Fisheries Inspectors	
		No.	%
1.	More than 5 ppm	1	9.09
2.	Less than 1 ppm	7	63.64
3.	1 to 3 ppm	1	9.09
4.	More than 1ppm	2	18.18
Total		11	100

4.3.3 (i): Knowledge about maintaining optimum nitrate level in the fish pond.

Table 3.3(i) highlights the knowledge of fisheries inspectors about maintaining optimum nitrate level in fish pond. It can be seen from the table that 18.18% of respondent officials gave the correct answer about it.

Table 3.3 (i): Knowledge about maintaining optimum nitrate level in the fish pond.

n=11

S. No	Maintaining optimum nitrate level in the fish pond.	Fisheries Inspectors	
		No.	%
1.	Removal of water	0	0
2.	Addition of water	2	18.18
3.	Replenishing water	8	72.73
4.	Do not know	1	9.09
Total		11	100

4.3.3 (j): Knowledge about effects of rise in temperature of water above optimum level in the fish pond.

Table 3.3 (j) gives the knowledge of fisheries inspectors regarding effects of rise in temperature of water. It is evident from the table that 54.55% gave correct responses.

**Table 3.3 (j): Knowledge about effects of rise in temperature of water
n=11**

S. No	Effects of rise in temperature	Fisheries Inspectors	
		No.	%
1.	Yes	6	54.55
2.	No	5	45.45
Total		11	100

4.3.2 (k) Overall knowledge of Fisheries Inspectors regarding water chemistry.

Many of fisheries inspectors replied correctly to 36-70% of questions regarding water chemistry. So, they fall in the medium level knowledge category.

Table 3.3 (k) Overall knowledge in water chemistry n=11

S. No	Knowledge level	Frequency
1.	High	0
2.	Medium	9
3.	Low	2
Total		11

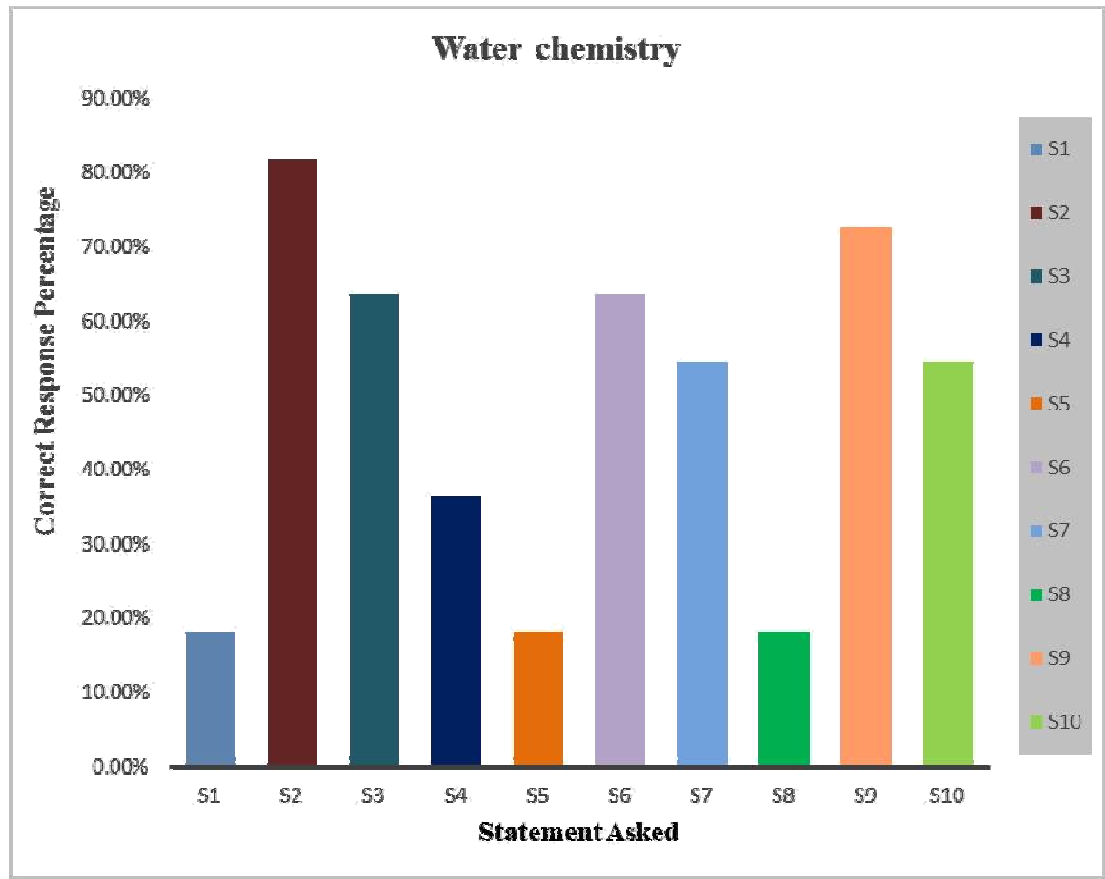


Figure 2: Correct response percentage in water chemistry.

Correct response percentage in Water Chemistry

S. No	Statement Asked
S1	Ideal temperature of Water in productive fish pond
S2	Required turbidity level of the fish pond
S3	pH of water in productive fish pond
S4	Ideal DO in the productive fish pond
S5	Required ammonia level in the productive fish pond
S6	What should be done if the acidity of the pond increase
S7	Required phosphate level in the fish pond
S8	Required nitrate level in the productive fish pond
S9	How to maintain the optimum nitrate level in the fish pond
S10	Effects of the rise in temperature above optimum level in pond water

4.3.4 Section IV: Knowledge of Fisheries Inspectors about Fish health and diseases.

Various question regarding fish health and diseases were asked to fisheries inspectors. The responses recorded were presented in the form of tables in this section

4.3.4 (a) Disease in which cottony wool tufts and grey white patches are found.

Table 3.4(a) presents knowledge of fisheries inspectors about disease in which cottony wool tufts and grey white patches are found. It is seen that majority (81.82%) of officials knew about the disease.

Table 3.4(a): Knowledge about disease in which cottony wool tufts and grey white patches.

n=11

S. No	Disease in which cottony wool tufts and grey white patches	Fisheries Inspectors	
		No.	%
1.	Branchiomycosis	1	9.09
2.	Aphanomyces	0	0
3.	Saprolegniasis	9	81.82
4.	Ichthyophonus	1	9.09
Total		11	100

4. 3.4(b): Knowledge about change in body color in saprolegnaisis

From the Table 3.4(b) the knowledge about the body color of the fish in Saprolegniasis is evident. It is apparent from the table the respondent officials did not know about the symptoms of disease.

Table 3.4(b): Knowledge about change in body color in saprolegnaisis.

n=11

S. No	Change in body color in saprolegnaisis	Fisheries Inspectors	
		No.	%
1.	Brown or greyish	0	0
2.	Black	2	18.18
3.	Red	8	72.73
4.	White	1	9.09
Total		11	100

4. 3.4(c): Knowledge about treatment given when fish eggs are covered by fungus.

From the Table 3.4(c) it is seen that only 18.18% of fisheries inspectors knew about treatment of the pond with unslacked lime when fish eggs are covered by fungus.

Table 3.4(c): Knowledge about treatment given when fish eggs are covered by fungus.

n=11

S. No	Treatment given when fish eggs are covered by fungus.	Fisheries Inspectors	
		No.	%
1	Bath in CuSO ₄	5	45.45
2	Treatment with potassium permanganate	2	18.18
3	Treatment with formalin	2	18.18
4	Treatment with unslacked lime	2	18.18
Total		11	100

4.3.4(d): Knowledge about disease in which carps are most effected.

From the Table 3.4(d) it is observed that only (9.09%) of the fisheries inspectors knew that the carps were most effected in Branchiomycosis.

Table 3.4(d): Knowledge about disease in which carps are most effected.

n=11

S. No	Disease in which carps are most effected.	Fisheries Inspectors	
		No.	%
1.	Branchiomycosis	1	9.09
2.	Aphanomyces	1	9.09
3.	Saprolegniasis	8	72.73
4.	Ichthyophonus	1	9.09
Total		11	100

4.3.4(e): Knowledge about season in which Branchiomycosis occurs most.

From the Table 3.4(e) it is observed that (100%) of fisheries inspectors knew that the Branchiomycosis occurs mostly in summer.

Table 3.4(e): Knowledge about season in which Branchiomycosis occurs most.

n=11

S. No	Season in which Branchiomycosis occurs most.	Fisheries Inspectors	
		No.	%
1.	Summer	11	100
2.	Winter	0	0
3.	Autumn	0	0
4.	Spring	0	0
Total		11	100

4.3.4(f): Knowledge about Disease in which numerous ball shaped cysts are formed in liver.

From the Table 3.4(f) it is observed that (54.55%) of fisheries inspectors knew that numerous ball shaped cysts in liver are formed in Ichthyophonus.

Table 3.4(f): Knowledge about Disease in which numerous ball shaped cysts are formed in liver.

n=11

S. No	Disease in which numerous ball shaped cysts are formed in liver	Fisheries Inspectors	
		No.	%
1.	Icthyophonus	6	54.55
2.	Aphanomyces	2	18.18
3.	Saprolegniasis	1	9.09
4.	Branchiomycosis	2	18.18
Total		11	100

4.3.4 (g) Treatment for Icthyophonus.

From the Table 3.4(g) it is observed that only (18.18%) of fisheries inspectors knew that during Icthyophonus disease fish pond should be treated with unslacked lime.

Table 3.4(g): Knowledge about treatment given to Icthyophonus

n=11

S. No	Treatment given to Icthyophonus	Fisheries Inspectors	
		No.	%
1.	Treating pond with unslacked lime	2	18.18
2.	Isolation of infected fish	1	9.09
3.	Draining water from pond	1	9.09
4.	Treating the fish with potassium permanganate	7	63.64
Total		11	100

4. 3.4(h): Knowledge about disease in which fish is found floating on water.

From the Table 3.4(h) it is observed that fisheries inspectors did not know about the disease in which fish is found floating on water.

Table 3.4(h): Knowledge about disease in which fish is found floating on water.

n=11

S. No	Disease in which carps are most effected.	Fisheries Inspectors	
		No.	%
1.	Argulosis	3	27.27
2.	Aphanomyces	0	0
3.	LarNeal disease	5	54.55
4.	None of the above	3	27.27
Total		11	100

4.3.4 (i): Knowledge about various fish diseases.

From the table 3.4(i) it is clear that fisheries inspectors have low level of knowledge about fish diseases.

- 45.45% of respondent officials knew about the diseases, in which fish eggs are covered by fungus.
- 18.2% of respondent officials knew about the disease, in which pale gills and deep red patches were present on body of the fish.
- 9% of respondent officials knew the treatment for branchiomycosis.
- 18.2% of respondent officials knew the treatment for free swimming stages of larnea
- 27.27% of respondent officials knew about the disease, in which fish is having extreme body irritation.
- 54.55% of respondent officials knew about the disease, in which fishes jump out of water.
- 18.18% of respondent officials knew the treatment for argulosis

Table 3.4(i): Knowledge about various fish diseases.**n=11**

S. No	Statement Asked	Fisheries Inspectors	
		Correct response frequency	Correct Response %
1.	Disease in which eggs are covered by fungus	5	45.45
2.	Disease in which fishes have pale gills with deep red patches	2	18.2
3.	Treatment for Branchiomycosis	1	9
4.	Treatment against free swimming stages of larnea	2	18.2
5.	Disease in which fishes have extreme body irritation	3	27.27
6.	Disease in which fish jump out of water or rub body against submerged objects	6	54.55
7.	Treatment for Argulosis	2	18.2

4.3.4 (j) Overall knowledge of Fisheries Inspectors regarding fish health and diseases.

Many of the respondents gave correct reply to only 10-35% of questions correctly. So, they fall in the low knowledge level category.

Table 3.4 (j) Overall knowledge in fish health and diseases**n=11**

S. No	Knowledge level	Frequency
1.	High	1
2.	Medium	4
3.	Low	6

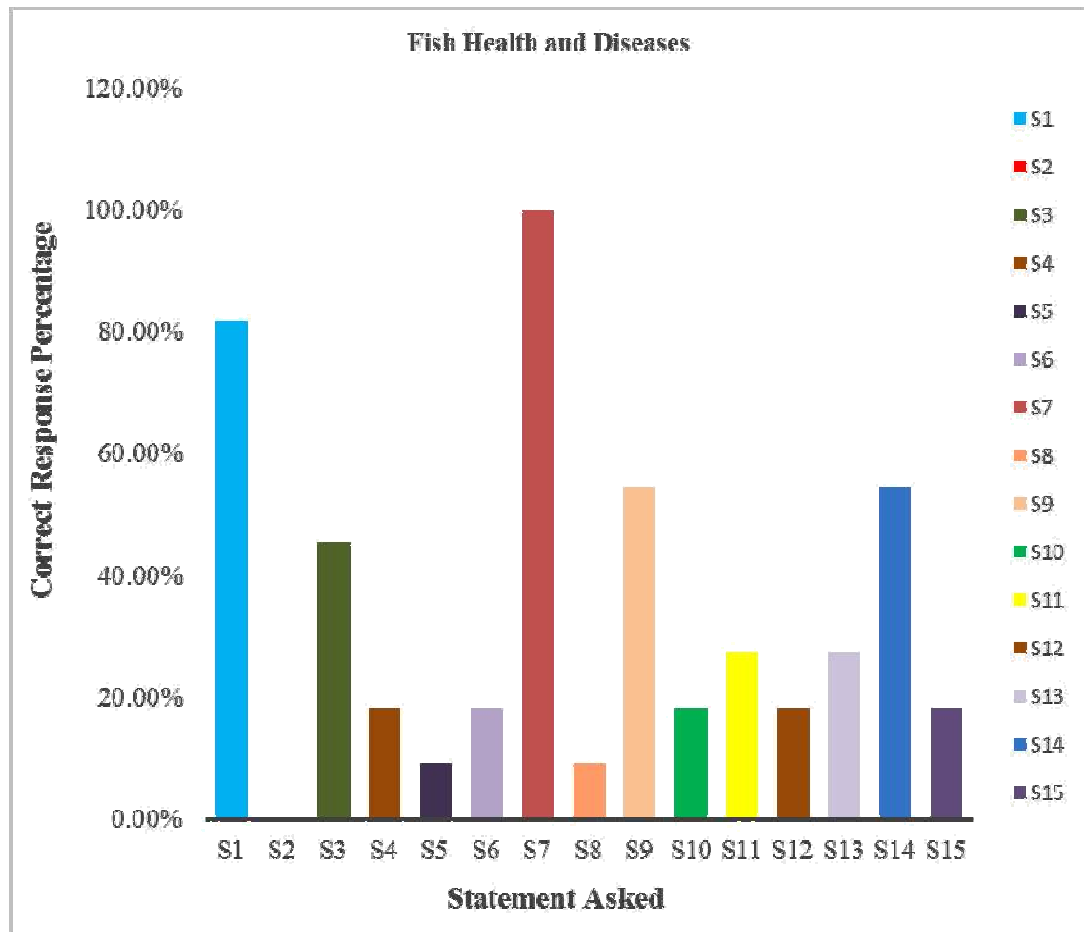


Figure 3: Correct response percentage in fish health and diseases.

Correct response percentage in fish health and diseases.

S. No	Statement Asked
S1	In which disease cottony wool tufts and white patches are found
S2	In Saprolegniasis body color of the fish changes to
S3	In which disease the eggs of the fish are covered by fungus
S4	Treatment given when fish eggs are covered by fungus
S5	Disease which effects carps most
S6	In which disease fishes have pale gills with deep red patches
S7	In which season this disease effects the most
S8	Treatment for Branchiomycosis
S9	In Which disease there are numerous ball shaped cysts in the liver of the fish
S10	Treatment given for Ichthyophonus
S11	In which disease fish is found floating on the surface of water with belly or abdomen facing upwards
S12	Successful treatment against free swimming stages of larnea
S13	In which disease fish is having extreme body irritation
S14	In which disease fishes have pale gills with deep red patches
S15	In which season this disease effects the most

4.3.5 Correlation table of age, education, experience and knowledge of fisheries inspectors.

From the table 3.5 it can be observed that there is a negative correlation

			Age	Education	Experience	Knowledge level
Spearman's rho	Age	Correlation Coefficient	1.000	-.810 **	.517	.120
		Sig. (2-tailed)	.	.002	.104	.726
		N	11	11	11	11
	Education	Correlation Coefficient	-.810 **	1.000	-.684 *	.000
		Sig. (2-tailed)	.002	.	.020	1.000
		N	11	11	11	11
	Experience	Correlation Coefficient	.517	-.684 *	1.000	-.254
		Sig. (2-tailed)	.104	.020	.	.451
		N	11	11	11	11
	Knowledge Level	Correlation Coefficient	.120	.000	-.254	1.000
		Sig. (2-tailed)	.726	1.000	.451	.
		N	11	11	11	11

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

between age and education, education and experience and experience and knowledge level.

4.4. Presentation of data from interview schedule II (Fisheries Guards).

The sample group two constitutes 89 fisheries guards. Sixty-four (64) in District Srinagar and twenty-five (25) in Budgam. Fisheries guards of the two districts were contacted and interviewed in order to collect the primary data.

4.4.1 Section I: Demography.

Several questions were asked to the respondents. In this section data on age, education, experience, place of posting is presented.

4.4.1 (a): Age

Table 4.1(a) highlights the age group of the respondent officials of state fisheries department. It can be observed from the table that 46.06% of fisheries guards are middle aged. 39.32% were above 50 and 14.6% were young

Table 4.1(a): Age group of the respondent fisheries officials
n = 89

S. No	Age group	Fisheries Guards	
		No.	%
1.	18-35	13	14.6
2.	35-50	41	46.06
3.	>50	35	39.32
Total		89	100

4.4.1(b) Education status.

It can be revealed from the Table 4.1 (b) that maximum number 29.21% of fisheries guards had education upto matric, followed by 24.71% middle passed. The minimum number 11.23% were graduates.

**Table 4.1(b): Education status of the respondent fisheries officials
n=89**

S. No	Education status	Fisheries Guards	
		No.	%
1.	Middle	22	24.71
2.	Under matric	21	23.59
3.	Matric	26	29.21
4.	12 th	10	11.23
5.	Graduated	10	11.23
Total		89	100

4.4.1(c) Sex

It is observed from the Table 4.1(c) that maximum number 95.5% of fisheries guards were males followed by only 4.5% females.

**Table 4.1(c): Sex of the respondent fisheries officials
n=89**

S. No	Sex	Fisheries Guards	
		No.	%
1.	Male	85	95.5
2.	Female	4	4.5
Total		89	100

4.4.1(d) Experience

Table 4.1(d) reveals the experience of the respondent officials. It can be seen that 61.8% of fisheries guards had the experience of 21- 30 years. 13.48% of fisheries guards had the experience of 31-40 years. 12.36% of fisheries guards fall in the category of upto 10 years of experience. 12.36% of fisheries guards had experience of 10-20 years.

**Table 4.1(d): Experience of the respondent fisheries officials
n=89**

S. No	Experience	Fisheries Guards	
		No.	%
1.	Upto 10	11	12.36
2.	10-20	11	12.36
3.	21-30	12	13.48
4.	31-40	53	61.8
Total		89	100

4.4.1(e) Place of posting

Table 4.1(e) depicts the number of respondent officials in one district. It can be viewed from the table that 71.9% of fisheries guards were posted in district Srinagar while 28.09% were posted in district Budgam.

**Table 3.1(e): Place of posting of the respondent fisheries officials
n=89**

S. No	Place of posting	Fisheries Inspectors	
		No.	%
1.	Srinagar	64	71.9
2.	Budgam	25	28.09
Total		89	100

4.4.2 Section II: Knowledge of Fisheries guards regarding Capture fisheries.

4.4.2 (a): Various aspects of capture fisheries

Table 4.2(a) reveals the knowledge of fisheries guards regarding various areas of capture fisheries. From the table following observations can be made:

- 68.54% of fisheries guards were aware about the breeding ground protection.
- Only (23.60%) were aware about mesh size regulation.
- Only 38.2% are aware about the use of selective gear.
- 60.67% of fisheries guards provided information to the fishers regarding the use of selective gear.
- 33.71% of fisheries guards knew the permissible level to which sand could be extracted from the rivers.

4.2 (a): Knowledge about various aspects of capture fisheries

n=89

S. No	Statement Asked	Fisheries Guards	
		Correct response frequency	Correct response %
1.	Breeding ground protection	61	68.54
2.	Mesh size regulation	21	23.60
3.	Closed season	34	38.20
4.	Provide information to fishers about use of selective gear	54	60.67
5.	Permissible level to which sand is extracted from rivers	30	33.71

4.4.2(b) Knowledge about the precautions followed during closed season.

From Table 4.2 (b) it can be observed that fisheries guards 16.85% did not have any knowledge about the precautions to be followed during closed season. 51.69% had knowledge about strict watch and ward and surveys. 24.72% had knowledge about prohibition of extracting pebbles from river side while 17.98% were knowledgeable about prohibition of sand extraction during closed season. 17.98% had knowledge about protection of breeding grounds. Only 15.73% knew that fishing should be banned during the closed season.

4.2 (b): Knowledge about precaution followed during closed season
n=89

S. No	Precaution followed during closed season	Fisheries Guards	
		No.	%
1.	No idea	15	16.85
2.	Strict watch and ward/ Surveys	46	51.89
3.	Prohibition of extraction of pebbles from river bed	22	54.72
4.	Prohibition of sand extraction	16	17.98
5.	Protection of breeding grounds	16	17.98
6.	Ban on Fishing	14	15.73

4.4.2 (c) Knowledge about gears used in state.

From table 4.2(c) it can be observed that 9% of fisheries guards did not have any idea about the gears used in state while rest 91% had the knowledge about the gears used in the state. 53.93% had knowledge about the cast net followed by 50.56% having knowledge about the of basket trap (Tokrijal) only 6.7% of fisheries guards had knowledge about use of dipnet during fishing.

**Table 4.2 (c): Knowledge regarding gears used in State
n=89**

S. No	Gears used in state	Fisheries Guards	
		No.	%
1.	No idea	8	9
2.	Castnet	48	53.93
3.	Bagnet (Khurijal)	10	11.24
4.	Dipnet	6	6.74
5.	Panzri	33	37.08
6.	Narchoo	36	40.45
7.	Gillnet (Patij)	28	31.46
8.	Basket trap	45	50.56
9.	Longlines (Waleraz)	44	49.44
10.	Pattijal	31	34.83
11.	Rod & line	7	7.87
12.	Scoopnet (Kranzjal)	25	28.08
13.	Hook and line	12	13.48

4.4.2 (d): Knowledge about fishing methods banned in Kashmir

Table 4.2 (d) reveals that 2.25% of fisheries guards did not have any information about the banned fishing methods in Kashmir. 46.07% were knowledgeable about the ban of gill net operated by fixed engine for fishing. 43.82% were aware about ban on use of bleaching powder for fishing. 42.70% had knowledge about ban on use of harpoons(Panzri), 25.84% knew about the ban on electric fishing and 23.60% ban on use of explosives. 11.24% were knowledgeable about ban on use of harpoons (Narchoo) while same percentage of respondents were aware about ban on use of Pattijal. (3.37%) said knew about ban on use of lights at night during fishing.

Table 4.2 (d): knowledge about fishing methods banned in Kashmir n=89

S. No	Fishing methods banned in Kashmir	Fisheries Guards	
		No.	%
1.	No idea	2	2.5
2.	Gillnet (Fixed engine)	41	46.07
3.	Panzri	38	42.70
4.	Use of bleaching powder	39	43.82
5.	Electric fishing	23	25.84
6.	Use of explosives	21	23.60
7.	Fishing by use of lights	3	3.37
8.	Narchoo	10	11.24
9.	Pattijal	10	11.24

4.4.2 (e): Knowledge about advantages of sand digging.

It is revealed from the table 4.2(e) that 7.87% were unaware about the advantages of sand digging. 62.92% knew that it reduced flood risks whereas 38.20% said it helped in maintaining proper depth.31.46% said it generates revenue, 7.89% deciphered that it helped in nutrient mixture. 5.62% said it helped in distillation, 4.49% said it decreases spillover. The same percentage said it increases water retaining capacity, 1.12% had knowledge that it changes natural waters of the waterbody.

Table 4.2 (e): Knowledge about advantages of sand digging.**n=89**

S. No	Advantages of sand digging.	Fisheries Guards	
		No.	%
1.	No idea	7	7.87
2.	Maintain depth	34	38.20
3.	Reduce flood risks	56	62.92
4.	Revenue	28	31.46
5.	Distillation	5	5.62
6.	Decreases spillover	4	4.49
7.	Increases water retaining capacity	4	4.49
8.	Nutrient mixture	7	7.87
9.	Changes natural water	1	1.12

4.4.2(f). Knowledge about disadvantages of sand digging.

Sand digging has its disadvantages also, such as destruction of flora and fauna, destruction of eco system, bank erosion etc. It is revealed from Table 6.7 that when fisheries guards were asked about it 14.61% had no idea. 56.18% had knowledge that it causes the destruction of breeding grounds while 44.94% knew that it destroys brooders as well as breaking of eggs. 13.48% knew that it destroys flora and fauna, 7.87% had knowledge that it causes bank erosion. 6.47% reported that it causes turbidity while 2.25% knew that it destructs aquatic ecosystem

Table 4.2(f). Knowledge about disadvantages of sand digging**n=89**

S. No	Disadvantages of sand digging.	Fisheries Guards	
		No.	%
1.	No idea	13	14.61
2.	Destruction of breeding grounds	50	56.18
3.	Destroys brooders as well as breaks eggs	40	44.94
4.	Destruction of flora and fauna	12	13.48
5.	Destruction of aquatic ecosystem	2	2.25
6.	Bank erosion	7	7.87
7.	Turbidity	6	6.74

4.4.2(g): Knowledge about ways by which illegal fishing is prevented in Kashmir

Table 4.2(g) reveals knowledge about the methods by which illegal fishing can be prevented in Kashmir. 13.48% had no idea about it. The majority 48.31% reported about filing of court case followed by 41.57% who knew about imposing penalty. 21.35% knew about imposing fine on culprits and 16.85% said nets are confiscated from the fishers involved in illegal fishing activities. 11.24% is of opinion that they should be sentenced and 4.49% imposes various acts.

Table 4.2(g): Knowledge about ways by which illegal fishing is prevented in Kashmir.

n=89

S. No	Illegal fishing prevented in Kashmir	Fisheries Guards	
		No.	%
1.	No idea	12	13.48
2.	Court case	43	48.31
3.	Snatching of nets	15	16.85
4.	Penalty	37	41.57
5.	Sentencing	10	11.24
6.	Necessary compensation	19	21.35
7.	Imposing various acts	4	4.49

4.4.2 (h) Knowledge about different Fisheries Acts implemented in state.

It is observed from the Table 4.2 (h) that 23.60% fisheries guards had no information about the fisheries acts implemented in state while the rest i.e. 76.40% knew different fisheries acts implemented in the state.

**Table 4.2(h): Knowledge about different Fisheries Acts implemented in state
n=89**

S. No	Different fisheries acts implemented in state	Fisheries Guards	
		No.	%
1.	No Idea	21	23.60
2.	FR/1 (Short title and commencement)	18	20.22
3.	FR/2 (Local extent)	25	28.09
4.	FR/3 (Extent of repeal of the existing laws and practices saving clause)	27	30.34
5.	FR/4(Interpretation clause Interpretation clause)	26	29.21
6.	FR/5(Declaring what waters are "sanctuaries," "Trout Waters," "Reserved waters" and "Protected Waters.")	14	15.73
7.	FR/6 (a) (Declaring that fishing be prohibited absolutely or subject to certain specified conditions).	11	12.36
8.	FR/6 (b) (Absolute prohibition be liable to be punished with imprison- against fishing in Sanctuary)	52	58.43
9.	FR/7 (a) (Fishing in "Trout" "Reserved" or "Protected" water with- "Reserved" or "Protected" waters allowed license).	49	55.06
10.	FR/7(b) (Use of dynamite etc., prohibited in any water)	52	58.43
11.	FR/7(c) (Use of poison, lime prohibited in any water)	42	47.19
12.	FR/7 (d) (Erection of fixed engine prohibited in any water)	16	17.98
13.	FR/7 (e) (Night fishing prohibited "Reserved" in any "Trout" or "Reserved" water)	12	20.22
14.	FR/7 (f) (Prohibition as to capture of English Trout)	16	17.98
15.	FR/7 (g) (Possession of nets by any person other than license holder prohibited)	18	20.22
16.	FR/7 (h) (Aiding and abetting of commission of any of the above offences prohibited).	18	17.98
17.	FR/7 (i) (Shikaris taking licensed under service not having a license).	16	17.98
18.	FR/7(j) (General prohibition penalties)	16	12.36
19.	FR/8 (Further Penalties)	11	12.36
20.	FR/9 (Penalty for continuing to commit an offence after having been warned to desist).	11	11.24
21.	FR/10 (Enhanced punishment awardable on second	10	49.44

	conviction etc).		
22.	FR/11 (Power to compound offence)	44	11.24
23.	FR/12 (Rewards)	10	10.11
24.	FR/13 (Procedure against accused persons.)	9	10.11
25.	FR/14 (Application for license how made)	4	4.49
26.	FR/15 (Grant of license how made)	4	4.49
27.	FR/16 (Special control of the Game Preservation Department in "Trout" "Reserved" and "Protected" waters.)	4	4.49
28.	FR/17 (Rules making power)	4	4.49

4.3.2 (i) Overall knowledge of Fisheries Guards regarding capture fisheries.

Many of the respondent officials gave correct reply to only 10-35% of questions correctly regarding capture fisheries. This shows that they fall in the low knowledge level category.

Table 3.2 (x) Overall knowledge in capture fisheries
n=89

S. No	Knowledge level	Frequency
1.	High	1
2.	Medium	33
3.	Low	55

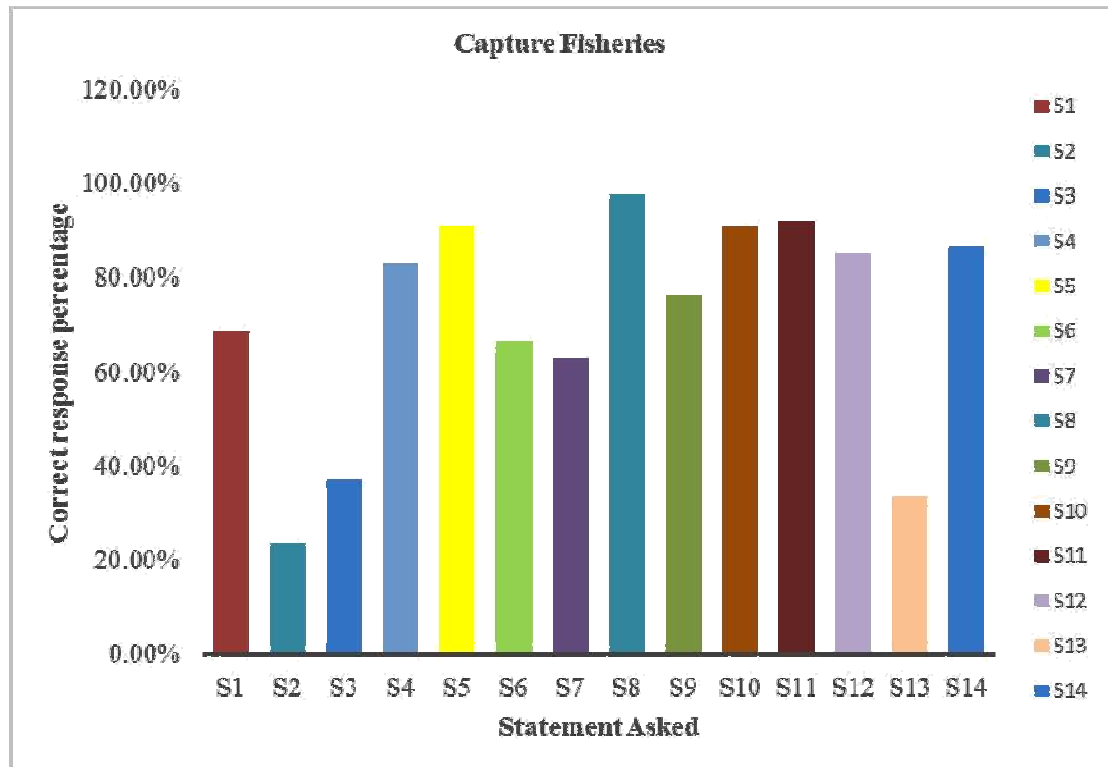


Figure 4: Correct response percentage in fish health and diseases.

Correct response percentage in capture fisheries.

S. No	Statement Asked
S1	Do You Know about breeding Ground Protection
S2	What is mesh size regulation
S3	What are closed seasons
S4	What precautions should be followed in closed seasons
S5	What are the different types of gears used in state
S6	Do you provide information to fisherman about use of selective gear
S7	Do you train fisherman about netmaking
S8	What are the various fishing methods banned by the government
S9	What are the different fisheries acts implemented in the state
S10	What are the effects of pollution in the waterbodies of the state
S11	What are the advantages of sand digging
S12	What are the disadvantages of sand digging
S13	What is the permissible level to which sand is extracted from the Rivers
S14	How is illegal fishing prevented in Kashmir

4.3.3 Correlation table of age, education, experience and knowledge of fisheries guards.

From the table 3.3 it is revealed that among fisheries guards there exists negative correlation between education with age, experience and knowledge level while positive correlation exists between age and experience and experience and knowledge level

Correlations

			Age	Education	Experience	Knowledge level
Spearman's rho	Age	Correlation Coefficient	1.000	-.325**	.601**	.176
		Sig. (2-tailed)	.	.002	.000	.099
		N	89	89	89	89
	Education	Correlation Coefficient	-.325**	1.000	-.364**	-.349**
		Sig. (2-tailed)	.002	.	.000	.001
		N	89	89	89	89
	Experience	Correlation Coefficient	.601**	-.364**	1.000	.049
		Sig. (2-tailed)	.000	.000	.	.646
		N	89	89	89	89
	Knowledge level	Correlation Coefficient	.176	-.349**	.049	1.000
		Sig. (2-tailed)	.099	.001	.646	.
		N	89	89	89	89

** . Correlation is significant at the 0.01 level (2-tailed).

Chapter 5

DISCUSSION

This chapter discuss the result of research work emerged from the analysis of the collected data during the research. It emphases on the main aim and the objectives of the research. The chapter interprets the results and makes a comparison with the results of other related studies. In each aspect of findings, references to the theoretical perspectives is made.

5.1 Personal profile of fisheries inspectors and fisheries guards.

5.1.1 Age

In the current study the respondents were distributed in the three age groups young, middle and old. It was seen that majority of fisheries inspectors were above 50 years. Looking to the age distribution of fisheries inspectors, it could be concluded that recruitment in case of these respondents was less. Among fisheries guards majority of respondents were middle aged i.e. within the age group of 36-70 years which again reveals that recruitment was also less in this case but better as compared to fisheries inspectors. Jeeva *et al.* (2004) reported in his study that majority of the respondents were above 45 years of age. Patel et al. during his study on utility of training programme on training management reported that majority of respondents belonged the age group 31 to 50 years.

5.1.2 Education Status

Education has a significant impact on the knowledge of the person. In the current study it was seen that majority of fisheries inspectors were graduates. Among fisheries guards majority had education upto matric while a minimum number were graduates. As majority of the respondents were well qualified as per the job requirement so they were expected to have good knowledge about various subject areas. However, the results presented a different picture. It was found that

none of the respondent officials fell into the category of high knowledge level which could be attributed to their less exposure to in-service trainings.

5.1.3 Sex

The findings of the study revealed that majority of respondent officials were males and only few were females. The availability of very less females as fisheries inspectors and fisheries guards represents the gender bias in employment. As in capture fisheries women play a pivotal role. Therefore, they need to be equipped with necessary skills, expertise and knowledge. The employment of more women at grassroot level will help in bridging the gap between extension agencies of the department and fisherwomen. Apart from this, there is a tremendous scope for culture fisheries in the state therefore government is focusing on self-employment through aquaculture. However, it has been found that mostly males are benefitted from this. In order to empower women in this sector there is a need to employ more female staff in this sector. The studies were supported by Jani *et al.* (2013) who in his study reported that majority (73.26%) of trainees were males and only one fourth (26.64%) were females. The study is in line with the studies of Patel *et al.* (2012) reported that majority (90%) of participants were males followed by only (10%) females.

5.1.4 Experience

Regarding the experience of the respondent officials the current study revealed that the majority of fisheries inspectors had experience of 10-20 years. Among fisheries guards majority had experience of 21-30 years. As the respondent officials in both the categories had a long experience in the department, so they were expected to have high knowledge level. However, results of the study revealed that none of the respondents officials were in the category of high knowledge level. This shows their less exposure to the trainings. Butt *et al.* (2013) reported that maximum number (42.53%) of respondent have experience of 11 to 25 years and only a 14.53% had above 25 years.

5.1.5 Place of posting.

In the present study it was observed that fisheries inspectors posted in Srinagar were more in number than district Budgam. Among fisheries guards also majority were posted in Srinagar. This may be attributed the fact that Srinagar have more water resources then Budgam.

5.2 Training Needs of Fisheries Inspectors in Aquaculture.

Aquaculture may be defined as the cultivation of aquatic organisms like fish, shellfish in natural or controlled conditions of marine and fresh water environment.

5.2.1 Most suited soil for site selection.

In the present study it was seen that fisheries officials had low level of knowledge regarding the most suited soil for site selection. Soil is an important factor in the construction of the pond. The quality and the thickness of the pond soil has profound effect on the productivity due to its absorption of nutrients like Ca, K, Mg, NH₄, PO₄ etc. Therefore, the knowledge of respondent officials need to be upgraded through the trainings thereby making them efficient enough to help the beneficiaries in the proper site selection. The results are in line with the finding of Hanif and Wanam (2013). He reported that agricultural assistant required trainings in the area of communication skill and human relation, administrative procedure. Olaye (2014) reported training needs of fish farmers in site selection of ponds during his study on information and training needs of fish farmers in Ogun state of Nigeria.

5.2.2 pH of the soil.

The findings of the present study revealed that fisheries inspectors had medium level of knowledge regarding pH of soil. The results indicate that more than half of the respondent officials need training in this aspect. pH of the soil has

direct impact on fish culture. In highly acidic conditions of soil fish culture is not suitable because they lose appetite. Highly alkaline conditions destruct the soil structure and retard fish growth. The neutral pH (6.5-7.5) of soil is suitable for pond bottom. Essential nutrients are released in balanced form in neutral pH. Looking to the importance of the pH on fish culture it becomes mandatory for the officials to have appropriate knowledge about the required pH in the soil. Patel *et al.* (2015) reported that majority of groundnut growers have training needs in application of manures and fertilization dose. Chauhan and Kshirsagar (2013) reported the training needs of tribal women plant protection and manures and fertilization.

5.2.3 Structure of pond.

The results of the study depicted that majority of respondents were found to be in the category of medium level knowledge about the structure of the pond. Regarding structure of ponds rectangular shaped ponds are preferred. Square and round ponds may be cheaper in construction for its shorter length of dyke, but not preferable because wide ponds are difficult to net. Moreover, construction of a number of wide ponds in an area will cause wastage of land in between. Right structure of pond is one of the prerequisites of successful fish culture. Therefore, the officials need to be trained in this aspect of aquaculture practices. The results of the study are in line with the findings of Kshash (2013). He reported that fish farmers of Babylon have medium training needs with respect to pond construction. Hossein *et al.* (2012) reported the training needs of fish farmers in the appropriateness of the dimensions of ponds with fish sizes.

5.2.4 Pond size.

During the current study it was revealed that the fisheries inspectors had medium level knowledge in this aspect of aquaculture. Size of the pond is important for the aquacultural operations. Larger ponds involve more expenses and are comparatively difficult to manage than smaller ponds. It is also difficult to

harvest from the large ponds as people can pull seines through small ponds by hand at the time of harvest while it is necessary to use trucks or tractors to pull seines through large ponds. Wrong selection of pond size may have the negative impact on the returns of fish farmers. Kshash (2011) reported training needs in pond area during his study on Training needs of fish farmers in Bablyon province within some aquaculture practices. Patel *et al.* (2012) reported training needs of participants during his study training needs of trainees participated in EEI workshop. Prajapati *et al.* (2015) reported the medium training needs of tribal farmers in seed production during his study on training needs of tribal farmers in agriculture.

5.2.5 Depth of the pond.

The current study revealed that fisheries inspectors were well acquainted about the average depth of the pond. Deeper ponds are often constructed in the areas where winter temperature could cause the water to freeze at the bottom of the pond. The average pond depth is 2-3 mtrs. However, too deep ponds pose problems of drainage as well as differential temperature in different depth levels which is harmful to productivity. Verma *et al.* (2013) reported low training needs among marigold growers. Pandya *et al.* (2014) reported low training needs among farmers for profitable farming.

5.2.6 Manure dosage of ponds (Nursery and Grow-out ponds).

During the current study it was revealed that fisheries inspectors have low training needs in nursery pond management while high training needs in growout pond management. Soil and water management is essential for optimizing fish production. Natural productivity of pond is greatly enhanced by the use of manures and fertilizers which provide essential nutrients for aquatic biota serving either directly or indirectly, through involved ecosystem as food of fishes. Adekoya, (2005) found that the areas of need for training is the pond construction and maintenance. Raina *et al.* (2014) revealed that a majority of farmers needed a

medium to high level of training in areas like optimum dose of fertilize. Patel *et al.* (2015) reported medium training needs were found among castor growers with respect to the application of manures

5.2.7 Liming dosage of ponds (Nursery and Grow-out ponds).

The current study revealed the fisheries inspectors have high knowledge level in this aspect of aquaculture practices. It was found that the respondent officials knew about the liming dosage in different ponds. Chemical parameters and pH tend to change frequently in small and confined water bodies. Application of lime brings about stable condition. Hence pond bottom is preferably limed with slacked lime, quick lime and ground lime. Hossein *et al.* (2012) reported low training needs of fish farmers for methods of disposal of dead fish and packaging fish for sale. Pagaria (2012) found the less important training need areas were construction of sheepsty (0.64), breeding aspect (0.80) and marketing of sheep (0.90). Patel *et al.* (2015) reported that tribal women of Sabarkantha district have low training needs with respect to group animal housing and capefan animal housing.

5.2.8 Color of water in the productive ponds.

The current study revealed that cent percent fisheries inspectors were aware about the color of the productive ponds. This shows that they do not need trainings in this regard. The productivity of the pond is the reaction between water and underwater soil. It is the limiting factor for overall production of fish seed and table fish. There are various means and ways to maintain productivity of ponds. It is necessary to have intimate knowledge about changes that occurs in the pond. Color of water is one of the indicative factor that gives idea about the condition of the pond. Generally, green color represents that pond is productive.

5.2.9 Level of culture systems of aquaculture.

During the study it was found that medium level knowledge about the level of culture system. Levels of culture system is the grading of culture system. It determines the level of care needed in the culture system and the production rate. There are four level of culture system extensive, semi-intensive, intensive and super-intensive level. The results depict that respondents need trainings regarding aquaculture systems. Yeasmin *et al.* (2013) reported that fish farmers gave second and third priority to „ways of diseases control“ and „breed selection“ for training. Record keeping, and certification standards are an important component in organic farming without which the produce cannot be sold as certified organic, and the majority of respondents reported a medium (40%) or high (24%) training needs indicating that they possessed inadequate knowledge in this area. (Yadav *et al.*, 2013).

5.2.10 Trout culture.

The current study depicts the knowledge of fisheries inspectors regarding various practices of trout culture. The results of the current study revealed that fisheries inspectors are well-versed with few aspects of trout culture however there are many more aspects of trout culture where knowledge level of fisheries inspectors was found to be low. So, there is a need of training in this aspect so that trout culture may flourish in the state. Patel *et al.* (2013) reported the dairy farm women have high to low training needs in management practices. Nongtdu *et al.* (2012) reported that out of 155 items, the extension personnel rated 45 items (29.03%) as most important, 82 items (52.90%) were rated as important and 28 items (18.07%) were found to be less important.

5.2.11 Overall training needs in aquaculture

The current study showed that the fisheries inspectors had medium level of knowledge regarding various aquaculture practices. It can be concluded from the study there is a need of training in various aspects of aquaculture. Aquaculture has witnessed an impressive transformation from highly traditional activity to the one

based on a well-developed and diversified infrastructure with immense potential for industrialization. Government of Jammu and Kashmir is focusing on the promotion of fish culture which will help in generating more self-employment opportunities for youth. They are spending enormous funds on the promotion of fish culture in order to enhance the rate of production in the state. To achieve the goal of enhanced fish production through aquaculture officials of the department need to be highly knowledgeable about the aquaculture practices so that they can be involved in the promotion and transferring of technologies to the beneficiaries. Verma *et al* (2013) reported that majority of marigold growers are under medium training needs category.

5.3 Training needs of fisheries inspectors in water chemistry

Water chemistry refer to the chemical, physical and biological characteristics of water. It is the measure of the conditions of water relative to one or more biotic species or to any human need or purpose.

5.3.1 Ideal temperature of water temperature.

During the current study it was revealed that fisheries inspectors had high training needs in this aspect. It may be due to inadequate knowledge of respondent officials in this aspect. The knowledge of the water temperature is essential as it is among the important physical properties of pond water. Too high and too low water temperature is not suitable for fish culture though fish can with stand a wide range of the water temperatures. Temperature changes though sub lethal can place a considerable amount of stress on homeostatic mechanism of fishes. Higher the temperature lesser is solubility of gases. Sanjeev and Singha (2010) in their study reported that 45% of farmers sought training in the water conservation. Patel *et al.* (2013) reported the reported highest training needs of in selection of breed with respect to breeding practices. Verma *et al.* (2013) reported that marigold growers need highest trainings in plant protection.

5.3.2 pH of the water.

It is apparent from the findings of the study that fisheries inspectors have medium level of knowledge in this aspect. It was seen that more than half of the respondents had knowledge about it. pH is one the most important physical characteristics in the pond management. Looking to the importance of pH it becomes essential for all fisheries inspectors to have knowledge about the water pH. Kumaran and Ponnusamy (2001) reported that more training was needed in the area of pond construction and management. Second rank training needs were found among the respondents for „selection of the fodder“ with mean score of 1.37

(Patel *et al.*, 2013). Pandya *et al.* (2014) reported that participants have medium training needs in family health and hygiene (Rank II).

5.3.3 Turbidity level.

The current study revealed that the officials had adequate knowledge about the turbidity level. Turbidity indicate the silt load and colloidal fraction in the pond water. Higher value of turbidity may result in the gill choking of fishes. Turbidity below 20 ppm is desired for productive ponds. The appropriateness of the dimensions of ponds with fish sizes, Methods of disposal of dead fish and Packaging fish for sale were the lowest ranked needs as perceived by the fish farmers (Hossein *et al.*,2012). Yadav *et al.* (2013) reported that majority of respondents recorded low or no training needs for the three of the need areas (composting, green manuring and crop rotations).

5.3.4 Ideal dissolved oxygen (DO) level in the productive fish pond.

In current study it was observed that majority of fisheries officials have high training needs in this aspect. It was found that majority of respondent officials were not aware about the ideal DO level in the productive pond. They were having low knowledge about the method of testing dissolved oxygen. Dissolved oxygen in water is the main source of oxygen for aquatic organisms. It

is inversely proportional with water temperature. In the scarcity of sunlight process of photosynthesis slow down and oxygen production is reduced but due the consumption of oxygen in respiration at night causes oxygen depletion. Therefore, to keep an optimum oxygen in the pond water is essential. Yadav *et al.*, (2012) reported that the respondents felt medium to high level of training need as far as the aspect of horticulture is concerned. The majority of the respondents (55.71%) perceived high training need followed by medium training need (34.29%) in the case of monitoring and evaluation of watershed programmes. Hossein *et al.* (2012) reported that fish farmers need highest trainings in the methods of disposal of dead fish. Patel *et al.* (2012) reported that maximum training needs of participants in computer application in agricultural extensions.

5.3.5 Ammonia level in the pond.

The officials had low knowledge about the required ammonia level in the pond. It is important to have optimum level of ammonia in the pond in order to maintain the chemical balance in the pond ecosystem. Therefore, the low level of knowledge regarding the appropriate ammonia level can create chemical imbalance in pond eco system. Yadav *et al.* (2013) reported that the respondents have inadequate knowledge about organic plant protection strategies including biological methods of pest control and bio-rational pest management techniques and the majority of them rated medium to high needs in these areas which could be due to their lack of exposure to appropriate knowledge, skills and awareness. The study is in line with the findings of Patil and Kokate (2011). They reported subject matter specialist have higher training needs on moisture conservation techniques for dry land farming (77.50%), management of acidic soils (76.67%), participatory integrated watershed management (75.83%) and conservation of common property resources (CPR) through agro-forestry (75.83%). Saleh *et al.* (2016) reported that majority of respondent have high training needs in water quality management.

5.3.6 Treatment in case of increase in acidity.

It is apparent from the findings of the study that the fisheries inspectors have medium knowledge in this aspect. It was seen that more than half of respondents know the treatment if the acidity of pond increases. However, the rest of respondent officials need to be made knowledgeable regarding the treatment of pond if acidity increases. pH is one of the most important physical characteristics of the pond. Too acidic or too basic water or soil of the pond are not suitable for growth of aquatic organisms. In case the acidity of the pond increases, it should be treated with lime. Kalsariya *et al.* (2015) reported that more than three-fifth of participants have medium level of knowledge before training during his study on impact of training programme in terms of gain in knowledge for sustainable agriculture.

5.3.7 Phosphate level in the fish pond.

As only half of the respondents were aware about the required phosphate level in the pond, therefore they need trainings in this aspect. Phosphate is one of the building units of protein synthesis but its level in the pond should be maintained. Release of phosphorous is dependent on the soil reaction. Slightly acidic conditions of the pond favor the release and availability of phosphate in the water column of fish pond. Kshash (2013) reported that majority of the respondents (47%) belonged to „medium“ category followed by 28% and 25% in „high“ and „low „categories of training needs in some aquaculture practices, respectively. The farm women in Barmer district need medium trainings in cleansing and management of sheepsty, management of sheep (Pagaria., 2012). The studies are in line with findings of Patel *et al* (2013). He reported the second rank training needs among farm women for individual housing with respect to management practices in dairy farming practices.

5.3.8 Nitrate level in the pond.

The findings of the study revealed high training needs in this aspect. The fisheries inspectors in general do not know much about nitrate level in the pond. Among the inorganic nitrogen ammonia, nitrate and nitrite are of great importance. It plays a key role. The high level of nitrate can be lethal to pond ecosystem. The addition of water maintains the optimum level of nitrate. Therefore, the poor knowledge of fisheries inspectors about the required nitrate level in the pond can have detrimental effect on fish culture. High of training needs on water quality management of agricultural extension officers were reported by Saleh *et al* (2016). Jeeva *et al.* (2006) reported high training needs among Andhra Pradesh officials for fish processing subjects. Chauhan and Kshirsagar (2013) reported highest training needs for poultry farming.

5.3.9 Overall training needs in water chemistry.

While studying the knowledge of fisheries inspectors regarding water chemistry it was revealed the respondent officials had medium level of knowledge about it. Water is an important component in the fish culture therefore having high knowledge about water chemistry is mandatory for the respondent officials. Hanif and Waman (2013) reported that majority of agricultural assistants require training to medium extent, whereas subject matter specialist need medium trainings in crop protection and management, animal dairy, veterinary and fishery.

5.4 Training needs of fisheries inspectors in fish health and diseases.

5.4.1 Saprolegniasis.

From the results of the study it was revealed that fisheries inspectors have insufficient knowledge about disease saprolegniasis. It is a fungal disease caused by *Saprolegnia paristica-diclina* complex. The lesions caused by Saprolegnia are focal patches on the skin of the fish which appear cottony wool like tufts underwater. The disease causes the heavy losses in the farms and the hatcheries.

The respondent officials should have adequate knowledge about the disease so that they will be able to recognize the initial symptoms of it and prevent the disease to spread further. Therefore, they have high training needs in this aspect. Patel *et al.* (2015) reported that castor growers have highest training needs in disease diagnosis and control measures of the disease. Kshash (2013) indicated that respondents have high training needs in fish disease and their causes. Patel *et al.* (2015) also reported the high training needs for disease diagnosis among the groundnut framers.

5.4.2 Branchiomycosis.

The results reveal that fisheries inspectors knew that it is a seasonal disease but were unaware that it is mostly affects carps. The results suggest that the respondent officials are not fully aware about the disease. Branchiomycosis also known as gill rot is a fungal disease. It is characterized by the areas of infractive necrosis in the gill due to the obstruction of blood vessel in the gill filament by fungi causing gill rot. The symptoms of the disease are damage of gill filament, pale gills showing deep red patches. It is predominant in summer season and causes maximum loss to carps. Therefore, the respondent officials should be provided with training in this aspect so that disease is detected in initial stage and loss due to it is prevented. Kumaran and Ponnusammy (2001) reported that shrimp farmers have high training needs in disease management. Nogutdu *et al.*

(2015) reported agricultural extension personnel in Meghalaya need training s in identifying the symptoms of pests, diseases and nematodes. Hossein *et al* (2012) reported that fish farmers have high training needs in prevention of disease.

5.4.3 Ichthyophoniasis.

It is apparent from the findings that fisheries inspectors have high training needs in this aspect due to their inadequate knowledge about the disease. The disease is caused by *Ichthyophonus* and is a systematic granulomatosis and is found in both in many species of both fresh water and marine fishes. The growth of

fungus causes local necrosis and results in the formation of either abscess or ulcers. The results are in line with the findings of Patil and Kokate (2011). They reported the high training needs in the advanced techniques in livestock diseases. Adekoya (2005) reported the training needs of fish farmers for fish diseases.

5.4.4 Larneal disease.

The results indicated that the fisheries inspectors have low level of knowledge about the larneal diseases. Thus, revealing their training needs for getting acquainted with the symptoms and cure of the disease. In larneal disease, fish is attached with larnea are found aberrantly swimming with gliding movement against bottom or submerged substratum marked with emaciation and loss of weight. Fish is found floating on water surface with face or belly facing upwards. Patel *et al.* (2013) reported the training needs of dairy farm women for precaution against parasitic diseases. Yeasmin *et al.* (2013) reported that fish farmers had first priority to get training on „selection of diseases free seed and second and third priority were „ways of diseases control“ and „breed selection“. The fourth priority was for „stocking density of fish species“ and fifth was „preventive measures of diseases“. Thus, it was clear that fish farmers had a lack of skills on fish disease management.

5.4.5 Argulosis.

The results of the current study revealed that fisheries inspectors have high training needs for argulosis. The officials have low level of knowledge about the treatment for argulosis. Argulosis is a widespread and harmful ectoparasite of freshwater fishes. It is also called as carp lice. The symptoms of the disease are extreme irritation of the body. Fishes swim at high speed and often jump out of water. They rub body surface against submerged objects. Patel *et al.* (2015) reported the training needs of tribal women in precaution against parasitic diseases in animal husbandry. Ogunlade *et al.* (2007) reported training needs of

fish farmers in fish diseases and their management. Kshash (2012) reported the training needs of fish farmers for fish diseases and their causes.

5.4.6 Overall training needs in fish health and diseases.

During the current study the overall knowledge of fisheries inspectors regarding fish health and diseases was low revealing their high training needs for the subject area. This subject matter that relates to abnormal changes such as structural, functional or behavioral that are produced by or characteristic of certain disease, a traumatic injury or nutritional deficiency. The fish diseases have caused heavy losses among the fish farmers. Therefore, fisheries inspectors should be well acquainted with symptoms and treatment of the various fish diseases so that they can help fish farmers in the initial stage of the disease which can prevent the losses of the fish farmers by the disease. Yadav *et al.* (2013) reported that agricultural extension workers need overall training in organic farming. Hanif and Waman (2015) reported the overall training needs of agricultural assistants in agricultural technology, soil and water conservation, preparation of crop production on the basis of agro-climatic conditions.

5.5 Training needs of fisheries guards in capture fisheries.

5.5.1 Breeding ground protection.

Majority of respondents were unaware about the breeding ground protection. Breeding ground protection means protection of places where fish gather to spawn, boosts healthy fish populations and improves the recovery of declining species. Fish in these areas produce greater numbers of eggs, which are more likely to survive and hatch. Therefore, fisheries guards need to be trained so that they can stop fishing by fishers in these areas which will help in the conservation measures. The findings indicated that the respondents felt medium to high level of training need as far as the aspect of horticulture is concerned. (Yadav, 2012).

5.5.2 Mesh size regulation.

During the study it was found that fisheries guards had low knowledge level in this aspect. Mesh size regulation is an important step towards the conservation of fish species. Mesh size regulation is a common measure to avoid catch of juvenile fishes, minimum and maximum size fishes and brooders. Therefore, it is important that fisheries guards are made aware about it so that they can prevent the fishing by irregular mesh sizes. The current study is in line with the studies Chauhan and Kshirsagar (2013). They reported that tribal women have high training needs in communication skills. Jeeva et al. (2006) reported that major thrust areas in which fisheries officials need training are fishing regulation and management measures.

5.5.3 Closed seasons

During the study it was revealed that fisheries guards have low knowledge regarding closed seasons. Closed seasons in fisheries depict ban on fishing during certain months of the year. Usually those months are the breeding season. This ban is imposed so that the capture of brooders is prevented. However, it was found that fisheries guards were unaware about the closed seasons. Being unaware about an important aspect they cannot prevent fishers from fishing during closed seasons. Therefore, they need to be trained in this aspect so that they can help in the conservation measures. The similar finding about training needs were reported by Patil and Kokate (2011). They reported that almost 80% of subject matter specialists reported trainings in extension education.

5.5.4 Sand extraction

During the study it was revealed that fisheries guards have high level of knowledge about advantages and disadvantages of sand extraction. Therefore, they had low training needs in this aspect. Sand extraction is the process of extraction of sand from river beds. It has various advantages such as reduce flood

risks, distillation, decrease spillover etc. The various disadvantages include destruction of flora and fauna, bank erosions, destruction of breeding grounds, turbidity etc. Therefore, they have low training needs in this aspect. Pagaria (2012) reported less important training need areas were found to be construction of sheepsty (0.64), breeding aspect (0.80) and marketing of sheep (0.90) in his study.

5.5.5 Gears used in state.

During the study it was revealed that majority of respondents knew about different gears used in the state. The study revealed that majority of respondents knew about cast net followed basket trap and longlines. Therefore, the fisheries guards have low training needs in this aspect as they have adequate knowledge about the gears used in the state. Patel *et al.* (2015) reported that the least important training need areas are value addition, grading and packing etc., marketing, harvesting time and method.

5.5.6 Banned fishing methods.

The results revealed that majority of fisheries guards knew about the banned fishing methods in the state. Certain fishing methods were banned for the better management of fishing resources. There is one provision kept in the model bill on inland fisheries and aquaculture, 2005 that stipulates the ban on the use of fishing crafts and gear that are destructive in nature, so as to conserve the biodiversity in general and endangered species in particular. Therefore, it is important that fisheries guards have adequate knowledge about the banned fishing methods in the state. Patel *et al.* (2015) reported that castor grower has low training needs in methods of irrigation.

5.5.7 Methods by which illegal fishing is prevented.

The results of the study revealed that majority the fisheries guards knew about the ways by which illegal fishing could be prevented. The majority of the

respondents reported filing of court case against the person. While there were other ways also such as snatching of nets, penalty, imposing various acts. Illegal fishing includes activities that does not follow the national or international laws and rules, it usually refers to fishing without a license, fishing in a closes area, fishing with prohibited gear, fishing over a quota or the fishing of prohibited species. The study is in line with the findings of Pandya *et al.* (2014) who reported the least important training needs areas of farm women are prohibitable farming of horticulture, fruit preservation. Chauhan and Khirsagar (2013) reported the tribal women SGHs has low training needs in sheep and goat rearing in agricultural management.

5.5.8 Fisheries acts.

During the study it was revealed that fisheries guards are not aware about all the regulations mentioned in the Jammu and Kashmir state fisheries act (1960). Though the majority know about FR/6 (b) which include prohibition be liable to be imprisoned against fishing in sanctuary and FR/7 (b) use of dynamite etc., prohibited in any water. Fisheries legislation is an important aspect of capture fisheries. The need for fisheries legislation was emphasized when the attention of government of India was drawn towards the indiscriminate slaughter of fish, fry and fingerlings and urgency to adopt legislative measures to conserve fish resources. Provisional governments were empowered to make rules to protect the fish resources. Therefore, fisheries guards need to be trained in this aspect so that they are well acquainted with the rules and regulations for fish resource conservation. Jeeva *et al.* (2004) reported that mean training index was high for fish processing (67.83%) followed by extension, economics and statistics (65.14%) and quality assurance and management (61.88%).

5.5.9 Overall training needs in capture fisheries.

During study it was found that fisheries guards have low knowledge about the capture fisheries. So, they need to be trained in this subject area which will

help in implementation of laws and acts formulated in order to conserve fish resources. Kashmir is bestowed with water resources, but the condition of these water resources is deteriorating day by day due to human activities. Capture fisheries deals with fishing from the natural resources. Therefore, various laws and acts have been formulated for the conservation of natural water resources and sustainable fisheries in particular for endangered species. However, it is important that fisheries guards are very well aware about all the aspects of capture fisheries. The findings clearly indicate that more than half (56.7 per cent) of the respondents had high training needs on integrated fish farming (Yeasmin *et al.*, 2013). Oladoja *et al.* (2007) reported that 89.3% of the fisherfolks are highly in need of training on fabrication of low cost fishing gears while 10.7% are of low need.

Chapter 6

SUMMARY AND CONCLUSION

The present study was carried on training needs assessment of officials of Jammu and Kashmir fisheries department during spring 2017. The study was carried out in Srinagar and Budgam district of Kashmir division of Jammu and Kashmir state. In present study an attempt was made to assess the current knowledge, skills and abilities of fisheries officials and identify the gaps in their knowledge, thereby identifying their training needs. It also aimed at the efficient utilization of resources like time, money and manpower through enlisting and conducting the need based trainings. The sample of the study constituted the fisheries inspectors and fisheries guards. Fisheries inspectors and the fisheries guards work at the grassroot level. They act as a bridge between fisheries department and the beneficiaries. The sample of the study constituted 100 respondents out of which 11 were fisheries inspectors and 89 were fisheries guards. Two different interview schedules were formulated in consultation with the subject matter specialists from the Faculty of Fisheries. Interview schedule I (Appendix I) was framed for fisheries inspectors and interview schedule II (Appendix II) for fisheries guards. Data was collected by interviewing the respondents. From the results, it was observed that

- Among fisheries inspectors majority of respondents were above 50 years of age while among fisheries guards majority were middle- aged which indicated that they had experienced staff and therefore, were expected to have high knowledge level regarding the subject matter.
- Among fisheries inspectors majority of respondents were graduates while majority of fisheries guards had education up to matric. Their education was in line with their job profile.
- Majority of fisheries inspectors and fisheries guards were found to be males, thereby highlighting an unequal male- female ratio in the department.

- Majority of respondent fisheries guards and fisheries inspectors were posted in District Srinagar. The reason for this could be attributed to the more number of water bodies in District Srinagar than Budgam district.
- The results of the study further revealed
 - the quality of manpower in J&K state fisheries department.
 - Current knowledge of fisheries inspectors and fisheries guards.
 - Knowledge gap and respective specific areas where respondents need trainings.
 - New skills to be imparted to the respondents
 - Prioritized training needs of the respondent officials.

Recommendations.

In view of the findings of the study on training need assessment, the following strategies and recommendations are presented.

Training need analysis must be done at regular intervals to identify the training requirements of the employees of the department.

- Prioritization of training needs followed by organization of need based training programmes will help in enhancing the knowledge of fisheries personnel. Trainings will keep them abreast not only with the recent happenings in the fisheries sector but will also enable them to deliver their duties efficiently.
- Long term and short-term training objectives and their relative prioritization should be properly analyzed. The training objectives must be SMART (specific, measurable, achievable, realistic and timed).
- A strong linkage need to be established between Faculty of Fisheries and State Fisheries Department that will help in identifying the training as well as research gaps.

- The State department officials should provide full cooperation to the researchers while collecting the data. Proper data collection shall help researchers in framing result oriented training programmes.
- Looking to the pivotal role played by female fishers in capture fisheries, induction of appropriate number of females as fisheries inspectors and fisheries guards will help in highlighting various issues especially the training needs of female fishers that are often ignored. At the same time female officials can motivate women to take up aquaculture enterprise for becoming self-reliant and empowered.

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Appendix I

Q1 Name of the respondent

Q2 Age

Q3 Sex

Q4 Qualification

Q5 Designation

Q6 Place of Posting

Aquaculture

Q7 Which is the most suited soil for site selection?

- a. Sandy
- b. Loamy
- c. Clayey loamy
- d. Both b & c

Q8 What should be the required pH of the soil at the pond bottom?

- a. 9
- b. 6.5-7.5
- c. 7
- d. Below 5

Q9 What should be the structure of the pond?

- a. Square
- b. Rectangular
- c. Trapezoid
- d. None of the above

Q10 What should be the required size of the pond

- a. Upto 0.1 hectares
- b. 0.1-0.2 hectares
- c. 0.2-0.3 hectares
- d. 0.3- 0.4 hectares

Q11 what should be the average depth of the pond?

- a. 0-2 mtrs
- b. 2-3 mtrs
- c. 4-5 mtrs
- d. 3-4 mtrs

Q12 What is the purpose of liming

Q13 What is the required dosage for the manuring of the nursery pond

- a. 5000 to 10000 kg RCD or 250 superphosphate
- b. 10000 to 15000 kg RCD or 250 superphosphate
- c. 150000 to 20000 kg RCD or 250 superphosphate
- d. 20000 to 25000 kg RCD or 250 superphosphate

Q14 What is the required dosage for the liming of the nursery ponds

- a. 25 kg/ha daily
- b. 50 kg/ha daily.
- c. 50kg/ ha weekly
- d. 75 kg/ ha weekly

Q15 What should be the colour of water in productive nursery ponds

- a. Blue
- b. Green
- c. Colorless
- d. Muddy

Q16 What should be the required dosage of manures in grow-out ponds

- a. 5000 to 10000 kg RCD or 250 superphosphate
- b. 10000 to 15000 kg RCD or 250 superphosphate
- c. 150000 to 20000 kg RCD or 250 superphosphate
- d. 20000 to 25000 kg RCD or 250 superphosphate

Q17 What is the required dosage for the liming of the grow-out ponds

- a. 50 kg/ha weekly
- b. 100 kg/ha daily
- c. 50kg/ ha daily
- d. 100 kg/ ha weekly

Q18 What are different levels of culture system

Q19 How many ponds are constructed in the extensive system

- a. One
- b. Two
- c. three
- d. Four

Q20 What is the culture duration in the semi- intensive level

- a. 12 months
- b. 10 months
- c. 6 months
- d. 4months

Q21 What is the stocking rate in the intensive level

- a. 20000 fry
- b. 23000 fry
- c. 25000 fry
- d. 27000 fry

Q22 In which system of aquaculture the rate of survival is highest

- a. Extensive
- b. Semi-intensive
- c. Intensive
- d. Super-intensive

Q23 Which level of culture system yields more crop

- a. Super-intensive
- b. Extensive
- c. Semi-intensive
- d. Intensive

Q24 What is the size of broodstock rearing raceway of the trout

- a. 10m×1m×7m
- b. 20m×2m×1m
- c. 15m×2m×1m
- d. None of the above

Q25 What is the stocking density of broodstock rearing raceway of the trout

- a. 20-40 kg/m³
- b. 30-40 kg/m³
- c. 15-30 kg/m³
- d. 10-20 kg/m³

Q26 What is the average temperature in the broodstock rearing of the trout

- a. 10-20⁰C
- b. 10-14⁰C
- c. 8-10⁰C

d. 8-15⁰C

Q27 What should be the minimum weight in the brood stock of the trout

- a. 500 gms
- b. 400gms
- c. 600 gms
- d. 700 gms

Q28 What is the size of the hatching tray

Q29 How many eggs are placed in each hatching tray

- a. 7000-1000 eggs/ tray
- b. 5000-6000 eggs/ tray
- c. 1000-4000 eggs/ tray
- d. 2000-5000 eggs/ tray

Q30 In how many days eyed ova stage is reached

- a. 10 days
- b. 15 days
- c. 20 days
- d. 21 days

Q31 In how many days eyed ova stage changes to alevin stage

- a. 10 days
- b. 15 days
- c. 11 days
- d. 14 days

Q32 How many raceways are in the trout hatchery.

- a. 3
- b. 4
- c. 6
- d. 5

Water Chemistry

Q33 What should be the ideal temperature in the productive fish pond

- a. Between 15 and 35 °C
- b. Between 10 and 20 °C
- c. Between 20 and 30 °C
- d. Between 10 and 35 °C

Q34 What should be the required turbidity level in the pond

- a. Below 20 ppm
- b. Above 20 ppm
- c. 20-25 ppm
- d. 25-30 ppm

Q35 What should be the pH in the productive waters

- a. 7-8
- b. 6-9
- c. Below 6
- d. Above 9

Q36 What is the ideal DO level in the productive waters

- a. 4 to 8 ppm
- b. 2 to 4 ppm
- c. 5 to 10 ppm
- d. 7 to 14 ppm

Q37 What is the required nitrate level in the productive fish pond

- a. More than 5 ppm
- b. Less than 1 ppm
- c. 1-5 ppm
- d. More than 1 ppm

Q38 What should be done if the acidity of pond increases

- a. Liming
- b. Addition of water
- c. Replenishing of water
- d. Do not know

Q39 What should be the required phosphate level in the pond water

- a. 0.2 to 0.5 ppm
- b. 0.1 to 0.2 ppm
- c. Above 0.5 ppm
- d. Below 0.1 ppm

Q40 What should be the required ammonia level in the pond water

- a. 0.2 to 0.5 ppm
- b. 0.1 to 0.2 ppm
- c. Above 0.5 ppm
- d. Below 0.1 ppm

Q41 What should be the required nitrate level in the pond water

- a. 0.2 to 0.5 ppm
- b. 0.1 to 0.2 ppm
- c. Above 0.5 ppm
- d. Below 0.1 ppm

Q42 How does rise in water above optimum level effect the fish pond

Fish Health and Diseases

Q43 In which disease cottony wool tufts and grey white patches are found

- a. Branchiomycosis
- b. Aphanomyces
- c. Saprolegniasis
- d. Ichthyophonus

Q44 In Saprolegniasis body colour of the fish changes to

- a. Brown or greyish
- b. Black
- c. Red
- d. White

Q45 In which Diseases fish eggs are covered by fungus

Q46 What is the treatment given when fish eggs are covered by fungus

- a. Daily bath in formalin
- b. Bath in copper sulphate
- c. Application of unslacked lime
- d. None of the above

Q47 In which diseases the carps are most effected

- a. Branchiomycosis
- b. Aphanomyces
- c. Saprolegniasis
- d. Ichthyophonus

Q48 In which diseases the fish have pale gills and deep red patches

Q49 In which season this disease effects the most

- a. Summer
- b. Winter
- c. Autumn
- d. Spring

Q50 What is the treatment for branchiomycosis

Q51 In which disease there are numerous ball shaped cysts in the liver of fish

- a. Ichthyophonous
- b. Aphanomyces
- c. Saprolegniasis
- d. Branchiomycosis

Q53 What is the treatment given in Ichthyophonous

- a. Treatment pond with unslacked lime
- b. Isolation of the infected fish
- c. Draining water from the pond
- d. Treating the fish with potassium permanganate

Q54 In which disease the fish is found on surface of the water with belly or abdomen facing upwards

- a. Argulosis
- b. Aphanomyces
- c. Larneal disease
- d. None of the above

Q55 What is the successful treatment against free swimming stages of larnea

Q56 In which disease the fish is having extreme body irritation

Q57 In which disease fish often jump out of water or rub body against submerged objects

Q58 What is the treatment for this fish disease

Appendix II

Q1 Name of the respondent

Q2 Age

Q3 Sex

Q4 Qualification

Q5 Designation

Q6 Place of Posting

Capture Fisheries

Q7 Do you know about the breeding ground protection

Q8 What is mesh size regulation

Q9 What are closed seasons

Q10 What precautions should be followed in closed season

Q11 What are the different types of gears used in the state

Q12 Do you provide information to the fisherman about the use of selective gears? Yes/ No

Q13 Do you train fisherman about net making? Yes/ No

Q14 What are the fishing methods banned by the government

Q15 What are the different fisheries acts implemented by the state

Q16 What are the effects of the pollution in the water bodies of the state

Q17 What are the advantages of the sand digging

Q18 What are the disadvantages of the sand digging

Q19 What are the permissible level to which sand is extracted from the rivers

Q20 How is illegal fishing prevented in Kashmir

Sher-e-Kashmir

University of Agricultural Sciences & Technology of Kashmir

Faculty of Fisheries, Rangil, Ganderbal

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CERTIFICATE

Certified that all the corrections/amendments as suggested by External Examiner during viva voce examination held on have been incorporated in the manuscript entitled **“ASSESSMENT OF TRAINING NEEDS OF OFFICIALS OF J&K STATE FISHERIES DEPARTMENT”** submitted by **Ms. Irtifa Gull (Reg. No. 2015-F-35-M).**

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