Chapter No. 2

Literature Review
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Chapter 2

Literature Review

2.1 Career:

Career is defined by the Oxford English Dictionary as a person's "course or progress through life (or a distinct portion of life)".¹ In this definition career is understood to relate to a range of aspects of an individual's life, learning and work.

Career can also be described as a profession or occupation or business of any individual and can be considered as a person’s working life². It can be simplified by common language saying that I am an Engineer, I am a Doctor, I am a Lawyer, I am a Stage Actor, etc. This indicates that career is a process in which an individual earn some knowledge and skill. Because of such knowledge and skill, he/she is engaged in some business and start earning money or name or fame or status etc. Key skills include the ability to reflect on one's current career, research the labour market, determine whether education is necessary, find openings, and make career changes.

2.2 Career Factor Theories:

Schruder (2006)³ mentioned three factor basis theories for career of an individual which are reviewed to understand how factor theories help individual in career.

Objective factor theory: This theory assumes that the applicants are rational and the choice is objective based and more depending on benefits the Job. These factors may include the salary, other benefits, location, opportunities for career advancement, promotion, etc.

Subjective factor theory: This theory talks about needs of an applicant and suggests that decision making is dominated by social and psychological factors. The status of

¹ http://en.wikipedia.org/wiki/Career
the job, reputation of the organization and other similar factors plays an important role.

Critical contact theory: when the applicant is not able to make choice based on objective or subjective he ends up with choosing a career based on observations. Like how the recruiter keeps in touch with the candidate, the promptness of response and similar factors are important. This theory is more valid with experienced professionals.

It can be observed that the above theories take that applicants get open choice of employers and careers. But on a practical ground when there is shortage of jobs and in strong competition for expected job impacts the decision making procedure. On many occasions individuals are forced to take whatever job is available to them. As found by Ott-Holland (2013) and his colleagues that culture can have a major influence on career choice, depending on the type of culture.

Due to this kind of situation, people do not stop at one place continue working and they start looking for a career of their liking.

### 2.3 Career Changing

Right Management carried out a survey on the reasons why people change their jobs and found the following reasons for career changing.

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The downsizing or the restructuring of an organization (54%).
New challenges or opportunities that arise (30%).
Poor or ineffective leadership (25%).
Having a poor relationship with a manager(s) (22%).
For the improvement of work/life balance (21%).
Contributions are not being recognized (21%).
For better compensation and benefits (18%),
For better alignment with personal and organizational values (17%).
Personal strengths and capabilities are not a good fit with an organization (16%).
The financial instability of an organization (13%).
An organization relocated (12%).

Article appeared on Time.com, it can be seen that one out of three people currently employed (as of 2008) spends about an hour per day searching for another job of their choice. Sometimes the individuals need to assess their potential and strengths for choosing a career. They have to test their knowledge and skills to make sure whether it is suitable for the type of job they are looking for. This type of career assessments can help individuals identify and better voice of their unique interests, personality, values, and skills to determine how well they may match with a certain career. Some skills that career assessments could help determine are job-specific skills, transferable skills, and self-management skills.

2.4 Career Assessment and Advancement

The career assessment process necessitates individual to take a career education. Career education means a procedure in which individuals learn about their strength, weaknesses, qualities, skills, etc. their careers and the working area. Now days it is found that there is a strong tradition of career education in schools, however career

education can be taken in any other wider scope including further and higher education and the organization they want to work. As advised by Law & Watt (1977)\(^9\) common framework for careers education is DOTS which stands for decision learning (D), opportunity awareness (O), transition learning (T), and self-awareness (S). Grubb and Lazerson (2005)\(^{10}\) discussed that most of the times higher education is thought of very narrow or too researched based and lacking of a deeper understanding of the material to develop the skills necessary for a certain career.

Employees career advancement is a phenomenon which is formalized, organized and it is planned effort to accomplish the balance between requirement of organization workforce and individual career needs. The rapidly rising awareness makes it evidence that employees can give leading edge to the organization in market place. It is challenge for today HR Managers to identify the organization developmental strategies which enthuses the employee commitment to the organization vision and values to motivate the employees and help the organization to gain and sustain the competitive advantage (Graddick, 1988)\(^{11}\). Greller (2006)\(^{12}\) states that people always work for a reason and the cause should be provided by work, organization, co- 

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workers or from within. Findings show that when employees want to advance in their careers, a motivational factor, it does not matter how old one is, a lot of stay in the organization as a way to advance.

Generally people may encounter a common problem while trying to achieve an education for a career is of the cost. The career that comes with the education expected to pay well enough to be able to pay off the schooling. There are some colleges provide their students more with just education to prepare for careers. It is a normal practice for colleges to provide pathways and support straight into the workforce the students may desire\textsuperscript{13}. This gives a rise of career decision making process.

Bandura et al (2001)\textsuperscript{14} state that each individual undertaking the Career decision making process is influenced by several factors including the context in which they live in, their personal aptitudes, social contacts and educational attainment.

According to Kerka (2000),\textsuperscript{15} career choice is influenced by multiple factors including personality, interests, self-concept, cultural identity, globalization, socialization, role model, social support and available resources such as information and finance.

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\textsuperscript{15} Middle School Career Education and Development, Practice Application Brief, No. 9, by Sandra Kerka, 2000
Bartley (1998)\textsuperscript{16} examined the process of career exploration during late adolescence. Factors associated with this process included career decision-making self-efficacy, motivational processes, goal directedness, vocational decision making style, personal growth initiative, ego identity, exploration beliefs and contextual anxiety. Findings suggest that a few constructs predict career exploration as well as many constructs and that men and women should be considered separately. Findings also suggest the need for further investigation.

\subsection*{2.5 Career Development}

In the annual review of 2002 of Practice and Research in Career Counselling and Development\textsuperscript{17}, several variables were identified as relevant to career development. Some of these salient variables were personality, interests, self-efficacy, social class, family environment context and important role in life. Career counsellors should explore these areas to determine their importance in the educational and career decision making of their clients.

In the 1970s, the definitions of career and career development used by some writers became broader and more encompassing. Jones and others (1972)\textsuperscript{18} defined career as encompassing a variety of possible patterns of personal choice related to an individual’s total lifestyle, including occupation, education, personal and social behavior, learning how to learn, social responsibility, and leisure time activities.

Within the Career literature, researchers have studied the family influence on career

\begin{itemize}
  \item \textsuperscript{16} Bartley, D. F. (1998) - CAREER EXPLORATION: AN EXAMINATION OF THE COMBINED EFFECTS OF MULTIPLE PREDICTORS, Ph d thesis
  \item \textsuperscript{17} By reporter (2002) Practice and Research in Career Counselling and Development retrieved from http://en.wikipedia.org/wiki/Career
\end{itemize}
development related issues such as Career selection (Bratcher 1982)\textsuperscript{19}, Career exploration (Blustein 1997)\textsuperscript{20}, development of vocational values (Lapan, Hinkleman, Adams & Turner 1999)\textsuperscript{21}, Career expectations (Paa & Mc Whirter, 2000)\textsuperscript{22}, Career Orientation (O’Brien, Fassinger 1993)\textsuperscript{23}.

Hirsh (2006)\textsuperscript{24} noted that career development helps employees understand how to identify and access work roles which suit them well and opportunities for improving their skills and developing their potential. Research Employees who are satisfied in their decision of work and feel the Institute is developing them, are better motivated, more concentrated and more able and willing to take on more challenging research work. Even if not aiming for career progression in conventional terms, career development helps employees to respond more positively to change within their job or

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in the organisation structure. Receiving this kind of career support also encourages employees to develop the skills and understanding to manage their own choices about work and learning more effectively in future. (Decenzo, David A. & Robbinns, Stephen A) mentioned that individuals should not be emotion in their first job. 25.

Gysbers and Moore (1975)26 proposed the concept of life career development in an effort to expand and extend career development from an occupational perspective to a life perspective in which occupation (and work) has place and meaning. They defined life career development as self-development over the life span through the integration of the roles, settings, and events of a person’s life.

Thomas J. Conlon (2004)27 Career development theories have focused on the human lifespan, traits, vocational choice, assessment tools, values and self-understanding to guide adults in their career decisions. However, many of these early theories have questionable value in today’s diverse workforce and where business practices have changed to reflect emerging economic competitiveness in a global economy. This paper reviews literature on career development and contemporary business trends. Career development implications and research questions for the 21st century workplace are identified.


Hall (2002)\textsuperscript{28} describes three stages of career development: the early years of becoming established, the middle years of maintenance and reexamination and the late years of adjustment into retirement. He describes the middle career stage as beginning somewhere around the age of 40, although it can vary. Because this age corresponds to changes in the life cycle, it provides a breeding ground for potential crisis. Hall (2002) describes nine physiological, attitudinal, occupational, and family changes that an individual experiences at this time. They are - Awareness of advancing age and death, awareness of physical ageing, knowledge of how many career goals they will attain, a search for new life goals, a marked change in family relationships, a

change in work relationships, a growing sense of obsolescence, a feeling of less mobility and attractiveness in the job market with growing security concerns, changes in the work environment.

Organization desire to strengthen their bond with employees must spend on the development of employees (Hall & Moss, 1998; Woodruffe, 1999; Steel et al., 2002; Hsu, Jiang, Klein & Tang, 2003). It creates promotion opportunities within organization and provides training opportunities and skill development to improve their employee’s employability on the external and/or external labour market (Butler & Waldrop, 2001).

Career development is vital for both the employees and employers (Hall, 2002). Career development is mutual beneficial process because it gives imperative


outcomes to employer and employees, (Hall, 1996). Gilley, Eggland, and Gilley (2002) suggest a collaborative effort, stating, “career development is a process requiring individuals and organizations to create a partnership that enhances employees’ knowledge, skills, competencies, and attitudes required for their current and future job assignments.” To gain and maintain competitive advantage, organizations required talented & productive employees and these employees need career development to enhance and cultivate their competencies (Prince, 2003). According to McDaniels and Gysbers (1992), career development is the total constellation of psychological, sociological, educational, physical, economic, and chance factors that combine to shape the career of any given individual over the life span. Forret and Sullivan (2002) describe three major shifts in the transition from organization-based to boundaryless careers. One addresses rewards, noting the change from interest in high salaries and job status to goals defined by personal interests and work-life balance. The second notes a transition from development of organization-specific skills to acquiring transferable skills that can move with the individual as she or he transitions from one system to another. The third tracks a change from loyalty to one’s organization to increased professional commitment that yields the potential for


Greenhaus, Callanan and Godshalk (2000) suggests that career development is an ongoing process by which individuals progress through a series of stages, each of which is characterized by a relatively unique set of issues, themes, and tasks. They have designed a model about career development. The Greenhaus et al. model focuses on the individual as the one who needs to make a decision, a need that leads to a career search and into a process of setting career goals, developing strategies and tactics to fulfil them, making progress, and all these form a process that requires career evaluation. The organization is only an external player in the system, according to this model, along with environmental influences. The major criticism of this framework is that it undermines the role organizations play in planning and managing careers. Figure 2.5.2 showing Greenhaus’s Career decision Model is given on the next page.

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Hall and Associates (1996)\textsuperscript{40} define career development as the outcomes emanating from the interaction of individual career planning and institutional career management processes. Career development as an HR intervention program is not about promoting linear career progression upwards through a layered hierarchy of increasing responsibilities, financial rewards and more time spent at work. It is about helping employees to become change resilient, more secure in them and their future as the organization adjusts to changing market situations. It is about increasing

employability that broadens the range of potential job roles open to the individual and extends the value of their staying with this employer.

Wolfe and Kolb (1980) summed up the dynamic life-centered view of career that has evolved over the past decades when they described career development as involving one’s entire life: Career development involves one’s whole life, not just occupation. As such, it concerns the whole person, needs and wants, capacities and potentials, excitements and anxieties, insights and blind spots, warts and all. More than that, it concerns him/her in the ever-changing contexts of his/ her life. The environmental pressures and constraints, the bonds that tie him/her to significant others, responsibilities to children and aging parents, the total structure of one’s circumstances are also factors that must be understood and reckoned with. In these terms, career development and personal development converge. Self and circumstances— evoking, changing, unfolding in mutual interaction— constitute the focus and the drama of career development.

The Institutes` reputation depends on the quality of talented personnel they have in the research Institute. The Research Institutes apply various strategies for providing better working conditions, improving research facilities, providing other facilities like housing, medical, welfare, updated library, electronic equipments, etc. required for research activities; to retain the research employees in their own institute. Both the research centres and the grant-in-aid institutions carry out research and development. While the research centres focus more sharply on technology and product development, the grant-in-aid institutions concentrate relatively more on basic research.

### 2.6 Overview of Career Development Theories:

Various theories of career development have attempted to explain how and why

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people make career choices and undertake career behaviours over their working lives. This chapter describes two major theories: the developmental/self-concept/trait theory of Donald E. Super, and the person-situation congruence theory of John Holland. Other theories are also listed at the beginning of the chapter. Super applied constructs and concepts from psychology, sociology and anthropology to the study of careers to create the most comprehensive theory of career development. He developed 14 empirically testable propositions of career development and theorized that individuals will choose occupations enabling them to function in roles consistent with their self-concepts. Holland used a structural-interactive approach to develop a theory which perceives personality type as the major influence on career choice and development, and includes elements of differential psychology, mainly interest measurement. The theory is based on nine assumptions and asserts that individuals choose educational and occupational environments allowing them to express their personality styles. The author concludes by answering the most commonly asked questions about career development theory.\footnote{Cramer, S, 1999, 'Overview of career development theory', pp.77-86. Ann Arbor, Michigan: Prakken Publications, 1999}

(R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C).

Mogi Kazuyuki and Wang Kuo-lin\textsuperscript{45} in their research paper titles “Illusion of Career Development Theories For the Departure of Developing a Demonstrative Career Development Theory” in The Economic Journal of Takasaki City University of Economics vol.49 No.2 2006 pp.17-30 overviews career theories. In the late 1930s, Super started his studies as an employment counselor in Ohio. Thereafter, to realize why do young people choose a particular job from many others, how do they accommodate to the transition from school to work and maintain themselves in the vocational position etc., Super (1957) and his associates conducted a study of career patterns by using a prospective, longitudinal, case-study design to inquire the interaction between personality and work. After observing vocational guidance from a viewpoint of different psychology, he shifted his attention to career choice in a developmental perspective. He suggested a concept of development on career (Super, 1957)\textsuperscript{46} that differed from precious studies regarding career as a selection of the initial job, rather than as a developmental process in sequence of occupational positions through the part or whole life (Super, 1980, p. 282)\textsuperscript{47}. Super (1990)\textsuperscript{48} later clarified career decisions had been incorporated with mini-decisions in varied career stages,


not something that happened once in a lifetime as the traditional career counselor widely perceived (p. 220).

Parson’s Trait and Factor Theory: This theory began with Parsons, who proposed that choice of a vocation depended upon (1) an accurate knowledge of yourself, (2) thorough knowledge of job specifications, and (3) the ability to make a proper match between the two. He wrote: "In the wise choice of a vocation there are three broad factors: (1) a clear understanding of yourself, your aptitudes, abilities, interests, ambitions, resources, limitations; (2) a thorough knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; (3) true reasoning on the relations of these two groups of facts" (Parsons, 1909/1989, p. 5)49. Williamson (1939)50 and others expanded this theory through the use of tests and other assessment tools to measure people's traits and the traits required in certain occupations. Two major assumptions of trait and factor theory are: (1) individuals and job traits can be matched, and (2) close matches are positively correlated with job success and satisfaction. These ideas are still part of our career counseling approach today.

In addition to the above theories, there are Krumboltz’s Social learning Theory, Gelatt’s Decision Making Theory, Cognitive Theory, and so on.

2.7 Working conditions for Career Development and Retention:

A numbers of studies have conduct to explain the work environment with different aspects such as job satisfaction (Iaffaldano & Muchinsky, 1985)51 and employee


retention (Martin 1979), employee turnover, organizational commitment and job involvement (Sjöberg & Sverke 2000). Work environment is considered one of the most important factors in employee’s retention (Zeytinoglu & Denton, 2005). According to Hytter (2008) work environment is generally discussed as industrial perspective, focus on aspect i.e. noise, toxic substances exposure and heavy lifts etc. The interesting part of work environment is; work environment characteristics in services sector is differ from production sector, because services sector directly deal with consumers / clients (Normann 1986). According to Ramlall,(2003), people are strive to work and to stay in those corporation that provide good and positive work environment, where employee feel that they are valued and making difference. Proficient employees of such organizations are dragging together to push the


organization forward.
Attracting and retaining talented researchers from anywhere in the world to a career in Research Institute is one of the most crucial factors. Figure 2.7.1 shows various factors influencing careers.

Figure 2.7.1: Factors influencing for choosing careers

Source: http://www.kent.ac.uk/careers/Choosing/choosingintro.htm - retrieved on 20/01/15

2.8 Retention

Retention of talented research employees is herculean task. Due to globalization every country wants to focus on development of science and technology which necessitates more numbers of researchers to join research organization and remain there so that continuous development is sustained. Research in various fields is well thought and ongoing process across the globe. The country’s development depends on the technological and research development. Every country wants to design and develop a research programme by involving expert people to contribute in the national or
international development with their novel ideas and innovations. The goal of every Research Institute is to engage young students in the field of research and development. These institutes implement the monetary and non-monetary aspects to motivate and retain such talented employees. Research Institutes, in addition to the routine office facilities, provide certain welfare facilities to research employees i.e. housing, medical, book grant allowances, update allowance, Leave Travel Concessions, Study leave, flexible hours, laptops, etc. This helps research employees to concentrate on their research work. This is part of their retention programme.

Employee retention refers to policies and practices companies use to prevent valuable employees from leaving their job. It involves taking measures to encourage employees to remain in the organization for the maximum period of time. Hiring knowledgeable people or the job is essential for an employer. But retention is even more important than hiring. Retention is a critical element of an organization’s more general approach to talent management, which is defined as “the implementation of integrated strategies or systems designed to increase workplace productivity by developing improved processes for attracting, developing, retaining, and utilizing people with the required skills and aptitude to meet current and future business needs” (Lockwood, 2006)\(^57\).

This is true as many employers have underestimated costs associated with turnover of key staffs (Ahlrichs, 2000)\(^58\). Ahlrichs also addresses the management style and cultures that encourage employee retention. Companies that have self-managed teams or are not afraid to decentralize decisions, for example, will be more attractive to top performers. The leadership qualities of supervisors at all levels are also important. Finally, Ahlrichs explains the importance of the employee development plans and


alternative compensation and benefits strategies that reinforce employee loyalty in EOCs. Turnover costs can incurred with issues such as reference checks, security clearance, temporary worker costs, relocation costs, formal training costs and induction expenses (Kotzé and Roodt, 2005). Other invincible costs and hidden costs such as missed deadlines, loss of organizational knowledge, lower morale, and client’s negative perception of company image may also take place.

2.9 Job Security for Retention and Career Development

One of the important factors for career development and retention is Job Security. Everyone wants to settle in the working life. If Job Security is provided or assured, then employees try to devote more time on their work. The same is the case of research employees. If job security is provided, the research employees work hard, put extra efforts on their research activities. They do not have to find other institute for better and secured job position. However, if job security is not given, the research employees leave the research institutes. In addition, there are various other reasons for research employees leaving the research institutes.

In India there are several Research Institutes in various research areas. Majority of them are functioning under various departments. The Research Employees or Researchers plays crucial part in the globalization and due to extreme demand for talented researchers across the globe, every organization face a problem of retaining talented researchers in their own institutes. These Institutes are in the field of basic research. They are engaging research employees in the institute to carry out various research activities. Research employees are selected after a structured and well-designed recruitment process. They have well defined career path in such institutes. These institutes have well organized career development programme. The human resource development practices ensure that these research employees get motivation from time to time. Since the fundamental research institutes function under the

government of India, their monetary aspects are more or less same. However, every institute has an unique programme to retain such research employees. Though they try every effort to retain such talented employees, there are some reasons for research employees to leave the research organizations.

2.10 Human Resource Practices for Career Development and Retention:

The research Institutes organizes various types of lectures, training and motivational programmes for research employees for his development. It is also true that in an employee develops then the organization also develops. Seminars, conferences, meetings, workshops, colloquiums, etc. help research employees to gain extra knowledge required for him to develop. While many times these programmes are arranged within the institutes or countries, some of them are organized at institutes outside India. Research employee gets a chance to participate in such conference if they are nominated by the institutes. Research Institutes pay contributions for such employees to enable them to participate in an international conference. This kind of non-monetary recognitions results in employee satisfaction. This study also have objective to find out the factors responsible for research employees to leave research organizations. (Muhammad Irshad)\(^6^0\) found that factors (categorized into organizational factor i.e. supervisor support, organizational justice, organization image and work environment) and Human resource factors i.e. employee value match, training & development, remuneration & reward, job security and employees promotion aspect do have an impact on retention programmes.

2.11 Other programmes for retention:

Research Institutes, in addition to the routine office facilities, provide certain welfare facilities to research employees i.e. housing, medical, book grant allowances, update allowance, Leave Travel Concessions, Study leave, flexible hours, laptops, etc. This

helps research employees to concentrate on their research work.

Previous researches suggested several factors which play pivotal role in employee retention Cappelli (2000). The factors which are considered and have direct affect are; career opportunities, work environment, work life balance, Organizational justice, and existing leave policy and organization image. Employee are stay and loyal with such organization where employee have value, sense of pride and work to their full potential Cole (2000).

The reasons to stay employee in organization are organization reward system, growth and development, pay package and work life balance. This is why retaining top talent has become a primary concern for many organizations today. Managers have to exert a lot of effort in ensuring the employee’s turnover are always low, as they are gaining increasing awareness of which, Meaghan et al. (2002), employees are critical to organization since their values to the organization are not easily replicated. Many critical analysis are conducted to minimize the possible occurrence of shortage of highly skilled employees who posses specific knowledge to perform at high levels, as such event will lead to unfavorable condition to many organizations who failed to retain these high performers. They would be left with an understaffed, less qualified workforce that will directly reduce their competitiveness in that particular industry. (Rappaport, Bancroft, & Okum, 2003).

Another important factor is flexible working


hours which motivates research employees on a very high scale. The have to sit late
night to work. Research Employees are more concerned about their research work and
they get job satisfaction through their research work.

The Institutes` reputation depends on the quality of talented personnel they have in
the research Institute. The Research Institutes apply various strategies for providing
better working conditions, improving research facilities, providing other facilities like
housing, medical, welfare, updated library, electronic equipments, etc. required for
research activities; to retain the research employees in their own institute. Both the
research centres and the grant-in-aid institutions carry out research and development.
While the research centres focus more sharply on technology and product
development, the grant-in-aid institutions concentrate relatively more on basic
research.

Hertzberg (1968)\textsuperscript{65} believes that every worker has two sets of needs (motivational and
hygiene needs). He contends that employees in this respect, employees will stay in
their work place so long as their needs are satisfied and they are motivated. Failure to
meet their needs would automatically call for departure hence employee turnover.
People are satisfied at their work by factors related to content of that work. Those
factors are called intrinsic motivators and contain achievement, recognition,
interesting work, responsibility, advancement and growth. Factors that make people
unhappy with their work are called dissatisfies or hygiene factors. Herzberg found the
following dissatisfies: company policy, supervision, working conditions, interpersonal
relationships, salary, status, security.

\textsuperscript{65} Herzenberg, F. 1968. One More Time: How Do You Motivate Employees?
2.12 Reasons for quitting organization

Most researchers (Bluedorn, 1982; Kalliath and Beck, 2001) have attempted to answer the question of what determines people's intention to quit, unfortunately to date, there has been little consistency in findings. Therefore, there are several reasons why people quit their current job and switch for other organization. The extent of the job stress, low commitment in the organization; and job dissatisfaction usually result in resignation of employees. Abundant studies have also certified the relation between satisfaction and behavioral intentions such as employee’s retention and spread the word of mouth (Anderson and Sullivan, 1993).

Having and retaining skilled employees play an important role in this process, because employees’ knowledge and skills have become the key for companies to be economically competitive (Hiltrop 1995). Therefore, it is important that employers give employees the opportunity to develop and learn (Arnold 2005; Bernsen et al.


such that the workers maintain their capacities as effective employees, resist redundancy, and are retained by their companies. As described by Ashton and Moreton, (2005), Talent management is one of the primary tools of 21st Century human asset management.

Trevor (2001), meaning that when employees do not feel satisfied in their job, the turnover is high and they are likely to leave the company. Figure 2.12.1 shows reasons for changing the job and quitting.

Figure 2.12.1: Reasons for employees to quit the jobs

Tett and Meyer’s meta-analysis also found that intention to leave was predicted more strongly by job satisfaction than organizational commitment and that intention to leave mediated the linkages between these attitudes and actual turnover. Hill and Jones (2001) noted that employees today are different. As soon as they feel dissatisfied with the current employer or the job, they switch over to look for another job. It is the responsibility of employers to retain their best employees. A good employer should know how to attract and retain its employees.


Henry Ongori (2007) stated that Employees are the backbone of any business success and therefore, they need to be motivated and maintained in organization at all cost to aid the organization to be globally competitive in terms of providing quality products and services to the society. And in the long-run the returns on investments on the employees would be achieved. Management should encourage job redesign-task autonomy, task significance and task identity, open book management, empowerment of employees, recruitment and selection must be done scientifically with the objective of retaining employees.

The Scientific Advisory Committee to the Government of India, submitted a detailed report highlighting need of retaining research employees in the research institutes. The Prime Minister of India also responded.” Today we in India are experiencing the benefits of the reverse flow of income, investment and expertise from the global Indian Diaspora. The problem of “brain drain” has been converted happily into the opportunity of “brain gain.” – Manmohan Singh, Prime Minister of India.

2.13 Does Money play important role in retention?

Compensation is considered the most important factor for attracting and retaining the talent (Willis, 2000). A fair wages are the foundation element of the implied and contractual bond between employers and employees, the underlying supposition being that monetary can persuade behavior (Parker and Wright, 2001).

According to Lawler (1990) company adopt the strategy of low wages if the work is simple and requires little training and companies compete in high labor markets adopt the high wages strategy. Some researchers argue that on the company side competitive compensation package is the only strong commitment and also build strong commitment on the workers side. However, the contribution of compensation towards retention, help in retention of employee irrespective of their skill and contribution to the company and it likely affect both turnovers desirable and undesirable. The total amount of compensation offered by other companies also affects the turnover. Organization offered high compensation package is compared to others a large numbers of candidates applying for induction and have lower turnover rate. Moreover high compensation package organizations also create culture of excellence (Lawler 1990),

According to Smith (2001) money bring the workers in the organization but not necessary to keep them. According to Ashby and Pell money satisfies the employee but it is not sufficient to retain the employee means it is insufficient factor. Money is not considered as primary retention factor (Brannick, 1999). Many organization implement very good employees retention strategy without offering high compensation or pay based retention strategy (Pfeffer, 1998). In such circumstances a wide number of factors are seems for successful retention of employees. The existence of other retention factors cannot be ignored.

81 Lawler, Edward E. (1990), Compensation management; Strategic planning; Pay-for-knowledge systems, Jossey-Bass Publishers (San Francisco)


83 Brannick, Joan, (1999), Employees; Job satisfaction; Labor turnover; Recruiting, AMACOM (New York).

2.14 Factors responsible for Retention:

National Talent Survey Report 2012 studies areas and put forth the following chart for giving various reasons and percentage people searching other jobs. Figure 2.14.1 shows the trend and reasons for searching a job.

Figure 2.14.1: Reasons for job searching

Source: National Talent Management Survey Report 2012 – AIMA

Researcher observed that human resource management practices in compensation & rewards, job security, training & developments, supervisor support culture, work environment and organization justice can help to reduce absenteeism, employee retention and better quality work (Meyer and Allen, 1991\textsuperscript{85}; Solomon, 1992\textsuperscript{86}; Snell


and Dean, 1992\textsuperscript{87}; Arthur, 1994\textsuperscript{88}; Snell and Youndt, 1995\textsuperscript{89}; MacDuffie, 1995\textsuperscript{90}; Delaney and Huselid, 1996\textsuperscript{91}; Ichniowski, Shaw and Prennushi, 1997\textsuperscript{92}). According to Accenture (2001)\textsuperscript{93} study on high performance issue find that organization strategy regarding employee retention primarily start from US, Europe, Asia than Australia. According to Osteraker (1999)\textsuperscript{94}, the employee satisfaction and retention are considered the Cornerstone for success of organization. Past study divided it into


social, mental or physical Dimension. The grouping is based on social contacts at works, characteristics of the work task or the physical and material circumstances associated with work. The retention factors of the mental dimension are work characteristics, employees are retaining by flexible tasks where they can use their knowledge and see the results of their efforts. The social dimension refers to the contact employees have with other people, both internal and external. The physical dimension consists of working conditions and pay.

Muhammad Irshad\textsuperscript{95} finds that Compensation, reward and recognition play a key role in employee’s motivation which leads to employee’s retention in the organization. In order to retain employees the organization need to gain information about the dynamics that characterized the motivation to work. Van Knippenberg (2000)\textsuperscript{96} suggested that employee become more loyal and stay in the organization when they identify themselves within a group and contribute to the performance as a group. This suggestion relies on work performed by Locke and the goal setting theory he developed. The goal is team performance and the individual feeling part of the group. The focus of Locke was on the goal, but in order to reach the goal one must associate oneself with the group and task. Glen (2006), describes another framework manager can use when communicating with its employees to know that the cause of retention consist of nine different predictors; organizational processes, role challenge, values, work, life balance, information, stake/leverage/recognition, management, work environment and product or service. Fitz-enz (1990)\textsuperscript{97} recognized that only one factor is not responsible in management of employee’s retention, but there is several

\textsuperscript{95} Muhammad Irshad - In Factors Affecting Employees Retentions Abasyn Journal of Social Sciences; Vo. 4 No.1 available at http://64.17.184.140/wp-content/uploads/2012/12/V4I1-7.pdf

\textsuperscript{96} Van Knippenberg, D. (2000), Work motivation and performance: a social identity perspective, applied psychology; an international review

factors influenced in employee’s retention which need to manage congruently i.e. compensation & rewards, job security, training & developments, supervisor support culture, work environment and organization justice etc.

2.15 Effects of not having retention programmes

Failing to retain key employee’s especially new graduates is costly for any business. Mendez and Stander (2011)\textsuperscript{98} further emphasizes that a company needs to invest in employee retention in order to be successful. Competition and the lack of availability of highly talented skilled employees make finding and retaining talented employees a major priority for organizations. Flegley (2006)\textsuperscript{99} posit that in cultivating a high performance workforce, both assessment of employees to ensure the best match to the job and the company and assimilating them to ensure successful integration into the workplace, the culture of the organization and specific roles and responsibilities are equally important. Schuler and Jackson (2006)\textsuperscript{100} state that recruiting people to meet the organization’s human resource needs is only half the battle in the war for talent, rather the other half is keeping these people.

Amit Bijon Dutta & Sneha Banerjee (2014)\textsuperscript{101} have mentioned possible reasons why


employees leave organizations such as Salary, Lack of Challenge or Growth, lack of recognition, loss of trust, loss of overall job satisfaction. Mathur A (2014)\textsuperscript{102} Offer a competitive benefits package that fits your employees’ needs. Providing health insurance, life insurance and a retirement-savings plan is essential in retaining employees. But other perks, such as flextime and the option of telecommuting, go a long way to show employees you are willing to accommodate their outside lives. Promote from within whenever possible. And give employees a clear path of advancement. Employees will become frustrated and may stop trying if they see no clear future for themselves at your company

2.16 Importance of Training and Development programme:

According to Goldstein (1980)\textsuperscript{103} and Latham (1988)\textsuperscript{104}, training is defined as the systematic acquisition and development of the knowledge, skills, and attitudes required by employees to adequately perform an assigned job or task to boost performance in the job environment.

Training and career development is considered most important factor in employee career development and retention. Organization has the incentive to make investment in form of training & development with an expectation to return and give output on its investment (Messmer, 2000)\textsuperscript{105}.

\begin{thebibliography}{9}
\end{thebibliography}
According to Clarke (2001)\textsuperscript{106}, organizations are intensification development for talented employees, through proficiency analysis, input on employee interests, need development and multisource appraisal of capabilities and formulate plans for action. Improvement in performance such as productivity, quality, and services are the training outcomes provided that the job is strategically aligned to the organization’s needs. For individual, if the desired needs of employee were fulfilled through the training programs provided, there is no doubt the desired outcome by the organization, retention on employees, will be reached. Wetland (2003)\textsuperscript{107} suggest that firms and individual made investment on human capital in the form of training. Training enhances the skills of employees. When employees are hired to enhance the skill, organization needs to start training program (Goldstein, 1991)\textsuperscript{108}. According to Noe (1999)\textsuperscript{109}, employees have perception to acquire new knowledge & skills which they apply on the job and also share with other employees. Research studies found that organization often delay employee training program to determine that workers personal value good matches with organization culture or otherwise, therefore to peter out the employee turnover intention (Lauri, Benson & Cheney, 1996)\textsuperscript{110}.


Training should impart new knowledge and skills if the training is relevant, meet employee and organizational needs, efficiently and effectively designed and delivered (Salas, 2003). When the results of training reflected in improvements in relevant knowledge and the acquisition of relevant skills, employee job performance should improve provided that the skills learned in training transfer to the job (Baldwin & Ford, 1998).

Garg & Rastogi (2006) explain that in today’s competitive environment feedback is essential for organizations to give and receive from employees and the more knowledge the employee learn the more he or she will perform and meet the global challenges. Storey and Sisson (1993), recommend that training is sign of organization commitment to employees. Leading firms of the industry recognize that comprehensive range of training, skill and career development is the key factor of attraction and retention the form of flexible, sophisticated and technological employees that firms strategy to succeed in the computerized economy (Bassi and Van Buren, 1999; Accenture, 2001).


Similarly Muhammad Irshad found that Training and career development was found motivating factor which leads to retention and career development was also associated with employee retention and was found important influencing factor in employee retention in the organization.

Huselid (1995)\textsuperscript{116} suggested that perceptions of HR practices such as providing training and job security by the company are important determinants of employee retention. Moreover, some studies also state that HR practices such as benefit and training are positively related to retention because the practices motivate employees and “lock” them to their jobs (Lazear 1986\textsuperscript{117}; Madrian, 1994\textsuperscript{118}; Gruber &Madrian, 1994),\textsuperscript{119} which are so called employee retention.

\section*{2.17 Recognition necessary for Retention:}

The annual survey of Watson Wyatt\textsuperscript{120} on worker attitudes toward employers and

\begin{itemize}
\end{itemize}
place, work USA 2002, show the opinions of 12,750 employees at all levels of job in all large companies, on different issues of workplace including rewards. The Watson Wyatt study finds that recognition is important for workers and they want to listen that their work are recognized and they are appreciated. Gordon and Meredith (2001) further emphasizes that a company needs to invest in employee retention in order to be successful.

2.18 Flexible working hours

Pasewark and Viator (2006)\textsuperscript{121} places flexible work arrangement as very important part of work family support that plays pivotal rule in the retention of employees. Thompson and Prottas (2005)\textsuperscript{122} examined the relationship between employee turnover intention and organization support such as supervisor support, flex time work family culture and co-worker support etc, and they conclude that organization support reduced the employee turnover intention. Therefore, it is essential to have flexible working hours particularly in research institutes.

2.19 Job Satisfaction:

Job satisfaction is a result of employees’ perceptions of how well their jobs provide in those qualities that they perceive as important (Luthans, 1998, p. 44)\textsuperscript{123}. A strong correlation, and in fact a causal relationship between job satisfaction, employee commitment and retention, has been established in several studies to date, as reported

\textsuperscript{121} Pasewark WR. Viator RE. (2006), Sources of Work- Family Conflict in the Accounting Profession. Behavioral Research in Accounting.;18:147–165.


by Roland et al (1996)\textsuperscript{124}.

2.20 Career, Career Development and Retention – overview pertaining to research, research institutes and research employees:

Background:

In particular it is relevant to quote the statement of Shri Atal Bihari Vajpayee, the then Prime Minister of India. ‘…Office of PSA to the Govt. of India should “Tackle the challenge of recruiting the best scientific talent into our research institutions and retaining them there” ’ – inaugural speech on 31.10.2002 at BARC Founder’s Day, Mumbai. \textsuperscript{125} In the same report, extracts from Summary records of discussions of the fifth meeting of the Scientific Advisory Committee to Cabinet Meeting held on 26th of March, 2003 at Vigyan Bhavan Annexe, New Delhi. M5 A2 M2: Measures to attract young persons to careers in science. While opening discussion on this issue, Dr. Chidambaram mentioned that serious concerns have been expressed at highest levels from time to time regarding decreasing interest of young talented people to take up careers in basic sciences. He further stated that if this trend is not checked at this stage, our country is going to face a serious shortage of talented researchers and teachers in a few years and that the symptoms of this are already visible.

The following figure 2.20.1 (on the next page) shows the numbers of research institutes in various sectors.


\textsuperscript{125} Attracting young people to careers in Science – Report by Office of the Principal Scientific Adviser to the Government of India, July, 2005
Figure 2.20.1: Numbers of research institutes in various sectors

The flight of talent from science careers is not the only kind of internal brain drain. A matter of equally significant concern is the flight of engineering students from technical to non-technical careers (management, business, etc.). The reasons for this are much the same as discussed earlier. With the growing consumerist culture in the country, prestige attaches to careers fetching more money. Academic and research careers in science or engineering, once highly regarded, are no longer valued greatly.

Government should provide an assured career to KVPY scholars who complete their Ph.D in science. It involves mechanisms to be evolved by all the major science related agencies of the country acting in a coordinated manner. It may offer some incentives to those industries if they employ Ph.Ds and science postgraduates.

Issue bureaucratic intervention of the government bureaucrats has been always of concerned of the head of research institutions. This point has been discussed and communicated to the higher authorities by many. Even the Prime Minster of India reiterated it again on 3rd January 2005. He said “ I am concerned about the tyranny of
bureaucracy and the quality of output in many of our scientific research establishments. The pursuit of research in science is an adventure, a creative endeavor. Are we creating the required environment for innovation, for experimentation, for risk and creativity in our institutions, be they universities or national laboratories? Or have we allowed bureaucratic systems and patron-client relationships to stifle creativity?"126

The Department of Science and Technology (DST), which was established in May, 1971, has the important objective of promoting new areas of science and technology and to be the nodal department for coordinating those areas of science and technology in which a number of institutions and departments have interest and capabilities. Thus, the DST has a unique role in promoting basic research and technology development in the country.127


127 Chapter 28, ‘Fifty year of Science In India’ available at http://www.iisc.ernet.in/insa/ch28.pdf
The Figure 2.20.2 shows the Science and Technology systems in India.

Figure 2.20.2: Science and Technology Systems in India

Source: http://www.iisc.ernet.in/insa/ch28.pdf

The following Figure 2.20.3 (on the next page) shows the Science and Technology Departments involved in research and development areas for the country.
The Department of Science and Technology nurtures 24 autonomous institutions. These include 15 research institutions, 5 professional bodies and 4 specialized knowledge institutions and S&T service organizations. The 15 research institutions in the DST family form a very special group from several points of view. Some of these are among the oldest research institutions in the country (including the oldest), some were started by eminent scientists and individuals like Mahendra Lal Sircar, CV Raman, JC Bose, Birbal Sahni and DN Wadia, some are repositories of very old and valuable scientific data, some lead the nation in niche areas like optical astronomy and geomagnetism – and so on. Most research institutions in the DST family are basic research institutions with the exception of ARCI-Hyderabad which has carved a very special place for itself as a premier technology development and transfer organization.
These institutions have an impressive portfolio of research publications and awards and honours earned by their scientists.  

2.21 SCIENCE AND ENGINEERING RESEARCH COUNCIL

The Science and Engineering Research Council (SERC) of the Department has emerged as the single largest support system engaged in promoting basic research in all areas of science and engineering and has achieved significant success in furthering the growth of research in frontier areas. It has been the main stay of open-ended basic research in the academic sector; about 44% of the extramural research funding in Universities/ Colleges was from SERC and the rest from 18 other Departments/ funding agencies. SERC continued its programmes to promote research and development (R&D) in new and interdisciplinary areas of Science & Engineering. Projects to be sponsored under SERC are carefully selected through the concept of Programme Advisory Committees (PAC). It played a pro-active role in identifying challenging areas of research and supported proposals with defined objectives in these areas.

SERC has over the years created a chain of research centers of excellence in diverse fields of S&T and contributed to augment R&D capabilities at academic institutions and national laboratories. Many of these Centres have advanced research facilities to attract young researchers.

Manpower Development is an integral part of the SERC Scheme. Innovative human resource development programmes were initiated/ continued. It continued supporting programmes like the Kishore Vaigyanik Prothsahan Yojana(KVPY), DST-JNC Summer Student Fellowships, Integrated Science Olympiad Programme, etc besides attracting Young Scientists to take up challenging R&D activities as a career.


Department of Science & Technology, in consultation with DOPT, other Scientific Departments and various organizations initiated an ambitious project of Human Resource Development namely “National Programme for Training of Scientists and Technologists working in the Government sector” for scientific and technical personnel during the X Plan to meet the challenges of national development and international competitiveness in S&T area. Considering the efficacy of the Scheme, the Department has decided to continue it in XI Plan.

The following Figure 2.21.1 shows the comparison of Scientists and Expenditure among selected countries. From this one can observe that India is too behind and need to do lot more.

Figure 2.21.1: Comparison of Scientist and Expenditure of different countries with India

<table>
<thead>
<tr>
<th>Country</th>
<th>Scientists per Million Population</th>
<th>Expenditure on R&amp;D per capita (US$)</th>
<th>Expenditure per Scientist (US$ 1000)</th>
<th>Ph.D per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>157</td>
<td>5.5</td>
<td>35</td>
<td>4.5</td>
</tr>
<tr>
<td>China</td>
<td>545</td>
<td>11.7</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Japan</td>
<td>5095</td>
<td>978</td>
<td>192</td>
<td>75</td>
</tr>
<tr>
<td>South Korea</td>
<td>2319</td>
<td>241</td>
<td>104</td>
<td>52</td>
</tr>
<tr>
<td>Australia</td>
<td>3353</td>
<td>285</td>
<td>85</td>
<td>-</td>
</tr>
<tr>
<td>UK</td>
<td>2666</td>
<td>460</td>
<td>172</td>
<td>-</td>
</tr>
<tr>
<td>USA</td>
<td>4099</td>
<td>705</td>
<td>230</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: http://www.iisc.ernet.in/insa/ch28.pdf

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2.22 Careers, Career Development and Retention of Research Employees at various Research Institutes at International and National level.

2.22.1 Career, Career Development and Retention Policy and Programmes at NRAO:

As a national facility operating in the public interest, the National Radio Astronomy Observatory (NRAO), USA has grown to be a premier astronomical observatory. It provides uniquely powerful facilities for researchers from around the world. Vision and Mission of the organization include development of scientific community, foster user community, develop society through educational programmes, career development of research and scientific staff of NRAO through high level of training programmes. The National Radio Astronomy Observatory (NRAO) strongly believes that a diverse staff is critical for our mission to enable world-class science with cutting edge radio facilities for the scientific community, to train the next generation of scientists and engineers and to foster a scientific literate society. We are committed to a diverse and inclusive work place culture that accepts and appreciates all individuals regardless of race, gender, age, ethnicity, ability, sexual orientation, socioeconomic status, religious affiliation, or national origin and culture.

Recruitment of scientific staff is a recognition of an individual’s competence, creativity, demonstrated accomplishment, and value to the mission of the Observatory. All appointments and promotions are based on qualifications and performance without regard to race, color, religion, gender, ethnicity, age, disability, marital status, veteran status, or any other characteristic protected by law.

Appointment to the Scientific Staff is recognition of action to attract members of under-represented classes of individuals to the Observatory staff.

Members of the Scientific Staff will have diverse operational functions within the Observatory, but will always have some fraction of their time available for

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131 http://www.nrao.edu/admin/hr/
independent, self-directed research. This ensures that the NRAO reaps the full benefits of its staff talent and guides the Observatory in the fulfillment of its mission. The NRAO Scientific Staff is divided into two career tracks, Astronomer and Scientist. They have separate promotion policy for scientific staff. Scientists and engineers who maintain a primary affiliation with or who hold grants from other institutions or foundations may be given temporary appointments at NRAO.

2.22.2 Career, Career Development and Retention Programmes at NASA:

To support the full utilization of the NASA workforce in achieving NASA's strategic outcomes and managing its human capital, it is NASA's policy to make training and developmental opportunities widely available to employees to enhance individual capabilities and competencies; build and retain a skilled and effective workforce; improve organizational performance; and maintain scientific, professional, technical, and management proficiency. More specifically, it is NASA's policy to: Support employee training, retraining, mentoring and coaching, and organizational development activities leading to better ways of delivering services, improving work performance, and increasing the value of employee contributions to current and future Agency missions.

Staff development programmes\(^\text{133}\) include policy and vision. Foster infusion of new ideas and innovation by expanding details, IPAs, rotations – particularly externally, Expand rotations and details to, and with, academia and industry, Expand use of rotations within NASA, Build skills across all levels of the workforce through leadership development opportunities, Train and Re-train to provide skills to close gaps, Improve communications – to drive engagement, motivation and sense of value as NASA transforms, Implement Agency-wide orientation program, Implement Executive Orientation Program. Require executive development plans, Expand executive development curricula, Continue and expand executive summits.

In a knowledge-based agency like NASA, it is important to have effective retention

\(^{133}\) http://nasapeople.nasa.gov/hcm/subgoal1.htm#goal3
strategies that will encourage experienced employees to remain as needed to mentor new talent and transfer knowledge or to ensure continuity on important programs and projects. The retention bonus provision in the NASA Flexibility Act of 2004 enhances the current retention allowance authority by (1) authorizing larger amounts to address critical needs of the Agency, (2) providing more flexible payment options, and (3) extending the circumstances under which a retention bonus may be offered.

NASA continuously uses survey results to gauge the attitudes and impressions of employees in key areas of their work experience that drive satisfaction, commitment and ultimately boost morale, productivity and our capacity for mission success. This year, 9,985 NASA employees (58.2% of the workforce) responded to this survey, providing a high degree of confidence in the results for senior leaders and managers.

2.22.3 Careers, Career Development and Retention of Researchers in Europe

To make matters worse, in certain countries there seem to be significant cuts in research funds and public spending, which clearly create negative trends that affect career development for researchers. The problem is more enhanced in fundamental research, where it is difficult to attract private funds, while in countries with low R&D there are no complementary opportunities in industry either.

ERC grants are inspiring researchers all over Europe to establish ambitious projects for frontier research and to shoot for the sky. They raise Europe's research profile worldwide and render it more attractive. Within this framework, the grant-holder panelists will discuss their experiences, the added value of ERC funding and prestige, the opportunities that this has generated for career development, and altogether how

134 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, 2013 Annual Employee Survey Results

the awarding of an ERC grant has impacted their professional lives.

Retention plan and strategy: Prevent brain-drain towards the US; this requires an answer to why top researchers leave Europe, and what can they get in the US that is not available here. Is it money, better equipment, a different (organizational) culture or all these together? These reasons should be clearly identified in order to offer improved conditions in Europe as well.

In addition, researchers from non-EU countries ought to be attracted by establishing appropriate immigration and administrative procedures. Provide better conditions for researchers wishing to return to their home countries after years of mobility. Pay particular attention to young researchers and enable them to develop their creative ideas and an early autonomy. Encourage the businesses sector to invest in R&D, for instance through fiscal benefits for demonstrated R&D expenditures. The 3% target is heavily dependent on the funding from enterprises, and on achieving the aim for a 2/3 contribution towards research from the private sector. Create industry/academic joint research centers. The governments could provide the infrastructures and equip such centers, while business funding would contribute in running costs. A good practice example in this direction is the European Institute of Molecular Biology in Heidelberg. Strengthen entrepreneurship by financing critical phases of enterprises, fostering academia-industry collaboration and favoring long-term foreign investment in Europe linked to R&D. Undertake concrete and large-scale initiatives in order to improve the quality standard of the R&D Process and Management (for instance, organizations that apply for EU funds should be able to demonstrate a genuine effort and ability to meet high standards of quality in this direction).

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136 CONFERENCE on “Enhancing the Attractiveness of European Universities as a Destination for World-Class Researchers” 5th Nov. 2012, Barcelona, European Research Council
2.23 Careers, Career Development and Retention of Research Employees:
Efforts in India

2.23.1 Department of Science and Technology:

HUMAN CAPACITY BUILDING THROUGH SCIENCE AND ENGINEERING RESEARCH: Department of Science & Technology is the largest support system for promoting basic research in science and engineering in the country. Science and Engineering Research Board (SERB), created through an Act of Parliament, implements various programmes for strengthening the human resource engaged in diverse fields of science and engineering. The Board has intensified its R&D activities through multifaceted programmes. The Board had met four times in the reporting period and has taken significant decisions on R&D management in the country.

Overall 681 scientists were supported under the Extra-mural Research (EMR) funding scheme for individual investigators through the Programme Advisory Committee mechanism. In addition, 1063 Young Scientists were supported under the Fast Track Scheme for Young Scientists. Annual releases for more than 2100 projects were made during the reporting period. 40 scientists received Ramanujan Fellowship and 22 received JC Bose Fellowship. Five projects were sanctioned under Intensification of Research in High Priority Areas (IRPHA). More than 800 scientists were supported under the International Travel Support (ITS) scheme which is designed to provide financial assistance for presenting a research paper or chairing a session or delivering a keynote address in an international scientific event (conference/seminar/symposium/workshop etc.) held abroad. A total expenditure of Rs. 550.16 crore was made by the Board for various R&D activities in 2013-14.

‘Women Scientist Scheme-A (WOS-A)’ has completed a decade of support and encouragement through S&T to women having break in their career and provide them opportunity to come back in main stream of science by pursuing research in Science & Engineering. Approximately 40% women scientists achieved Ph.D. degree with the help of WOS-A project which show the relevance and popularity of the scheme.

Training and Development: Department of Science & Technology, in consultation with DOPT, other Scientific Departments and various organizations initiated an ambitious project of Human Resource Development namely “National Programme for Training of Scientists and Technologists working in the Government sector” for scientific and technical personnel during the X Plan to meet the challenges of national development and international competitiveness in S&T area. Considering the efficacy of the Scheme, the Department has decided to continue it in XI and XIIth Plan also. During the year 2013-14, 33 training programmes were conducted under “National Programme for Training of Scientists and Technologists working in the government Sector” and a total number of 720 scientists got benefited from these training programmes. Under the Foreign Component of the Training Programme, 25 Junior level Scientists were deputed for five day exposure visit to Germany and 14 Senior and Middle Level Scientists were deputed for five day exposure visit to Australia during the financial year 2013-14.

2.23.2 Department of Space, India

Space activities in the country were initiated with the setting up of Indian National Committee for Space Research (INCOSPAR) in 1962. In the same year, work on Thumba Equatorial Rocket Launching Station (TERLS) near Thiruvananthapuram was also started. Indian Space Research Organization (ISRO) was established in August 1969. The Government of India constituted the Space Commission and established the Department of Space (DOS) in June 1972 and brought ISRO under DOS in September 1972.

The total approved sanctioned strength of the department as on 1.3.2013 is 18,561 out of which 12,850 are in scientific and technical categories and 5,711 are in administrative categories. Welfare measures like housing, medical, canteen and schooling for children, are extended to the existing personnel under different approved schemes. Life insurance coverage from accidents in the work place, namely

VISWAS and a special scheme for assistance to families in exigency, namely, ‘SAFE’, are also extended to employees at a relatively low premium through an internal trust. The competency, commitment and dedication of ISRO/DOS personnel have played a key role in various achievements of the Indian space Programme. DOS attaches great importance to the quality in recruitment, training and development of its human resources to meet the stringent requirements of the space programme and realization of goals and objectives of the Department.

Centralized recruitment of scientists and engineers with degree in Engineering has been continued during the year. The applications were received on ISRO website and selection and induction of engineers have been completed through a process of written test and interview on an all India basis. Centralized recruitment processes have been continued for Officers in Administrative areas, Office Assistants and Jr Personal Assistants during the year.

ISRO/DOS has been absorbing the bright graduates from the Indian Institute of Space Science and Technology on successful completion of their B.Tech programme with certain level of benchmark. The third batch of students, who were admitted to B.Tech Programme during September 2009 at Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, have graduated during June 2013. A total of 121 students who have passed out fulfilling the quality benchmark, have been inducted in all DOS/ISRO Centres.

Training and Development: The scheme of induction training programme for newly recruited scientists/engineers which was introduced in 2002, has been continued during the year. The scheme is useful for youngsters to understand various systems in the Indian Space Programme. Similar induction training programmes have been continued for newly recruited administrative staff wherein they are introduced to various rules, regulations, systems and processes that are in vogue in the organization. Customized residential Management Development Programmes were also conducted for Officers in Purchase and Stores area and the programme provided refresher course on all matters pertaining to the subject.

As part of the strategy of identifying and developing futuristic leaders, a group of 51
senior executives were identified and a customized training programme in five modules was designed. The first three modules covering scientific and technical topics in Spacecraft Technologies, Space Transportation System and Space Applications were designed and delivered to them. A specially designed management module was also administered to these executives at the Indian institute of Management, Ahmedabad. The last module on administrative systems is being planned shortly.

Space Studies Programme (SSP) 2013 for young Scientists/Engineers organized by International Space University at International Space University Central Campus, Strasbourg, France was continued during the year and six Scientists/Engineers from different Centres/units took part in it. Customized and exclusive training programmes and Management Development Programmes for middle level scientific, technical and administrative officers, under collaboration with reputed Institutions, were also continued.

2.23.3 Department of Atomic Energy

For induction to the constituent units of the Department, a well-defined human resource development programme implemented through the BARC Training School and its affiliate Training Schools at CAT, NFC and NPCIL is in place. The first batch graduated from BARC Training School in 1958 and the programme has evolved through feedback from senior staff, faculty and young trainees. The management structure provides for continuous revision of syllabi including introduction of new courses and streams depending on the requirements of the Department. As a part of this process of evolution, new programmes have been introduced and the schemes in operation at present provide for opportunities for employment in the DAE system to young aspirants after B.Tech. or M.Sc. through Orientation Course for Engineering Graduates and Science Post-graduates (OCES), after M.Tech. through DAE Graduate Fellowship Scheme (DGFS) and after Ph.D. through K. S. Krishnan Research Associateship (KSKRA).

139 Annual Report 2013-14, Department of Atomic Energy, India, http://dae.nic.in/?q=node/789
All the grant-in-aid institutions have high quality programmes leading to degrees by research. Graduates of these programmes have very high employment potential. As a part of the process of evolution, the most recent initiative is the proposal to set-up an Institute within DAE having the status of a university. This institute will be called Homi Bhabha National Institute (HBNI) and an application has already been submitted to Ministry of Human Resource Development for this purpose. A new building for the BARC Training School is also being constructed in Anushakti Nagar.

Achievements of the Department over the past 50 years were acknowledged and it was recognized that the DAE institutions are the beneficiary of long-term stable enlightened support to fundamental research. As a result, DAE has in its fold the best institutions in the country with the best brains the country has. Overall, it was felt that while the Department has performed very well during the past 50 years, in the next 10 years it might have to do almost as much or even more. Though the vision is something like a mature dream, one cannot lose sight of the fact that vision has to be amenable to implementation. Long-term energy scenario calls for massive expansion in nuclear power in the country and India has to develop new technologies that are needed consistent with its objectives and resources. However, India has to choose an independent path for technology development and this is because of two reasons - one because of prevailing technology control regimes and two being a large country with a high density of population, its problems are unique.

The Government of India in the Department of Personnel & Training in their Office Memorandum dated 15th April, 1996 has notified a comprehensive strategy for implementing the National Training Policy formulated and approved based on the report of a Working Group on National Training Policy. DAE has set up a Training Institute called Administrative Training Institute (ATI). The guidelines stipulate that all categories of civil servants shall receive induction training at the time of entry in to service and in service training at suitable intervals in their career. Attendance in training programme shall be prescribed as a mandatory exercise with possible linkages with career progression. It is also mentioned in the guidelines that each department shall set apart 1.5% of its salary budget which shall be used solely for the
purpose of training and shall not be diverted for use elsewhere.\footnote{Administrative Training Institute of India, DAE, http://ati.dae.gov.in/About\%20ATI.htm}

DAE has good linkages with the university system as well as industry. There were proposals to further strengthen these linkages. Technology transfer should be encouraged and co-ordination at the DAE level in this area should be strengthened. DAE institutions and professional societies, wherein DAE employees have a major role are engaged in several activities, example being National Initiative on Undergraduate Science and programmes for training students for participation in the International Olympiads run by Homi Bhabha Centre for Science Education, programmes for college teachers run by Indian Association of Nuclear Chemists and Allied Scientists (IANCAS), essay competition run by Public Awareness Division of DAE. All these programmes should be strengthened. Training provided to undergraduate students during summer, facilities and guidance provided to undergraduate and post-graduate students for projects should be continued.


The Council of Scientific & Industrial Research (CSIR), known for its cutting edge R&D knowledgebase in diverse S&T areas, is a contemporary R&D organization. Having pan-India presence, CSIR has a dynamic network of 38 national laboratories, 39 outreach centres, 3 Innovation Complexes and 5 units. CSIR’s R&D expertise and experience is embodied in about 4600 active scientists supported by about 8000 scientific and technical personnel.

CSIR covers a wide spectrum of science and technology – from radio and space physics, oceanography, geophysics, chemicals, drugs, genomics, biotechnology and nanotechnology to mining, aeronautics, instrumentation, environmental engineering and information technology. It provides significant technological intervention in
many areas with regard to societal efforts which include environment, health, drinking water, food, housing, energy, farm and non-farm sectors. Further, CSIR’s role in S&T human resource development is noteworthy.

Council of Scientific & Industrial Research (CSIR), India, a premier national R&D organization, is among the world's largest publicly funded R&D organization. CSIR's pioneering sustained contribution to S&T human resource development is acclaimed nationally. Human Resource Development Group (HRDG), a division of CSIR realizes this objective through various grants, fellowship schemes etc.

Human Resource Development Group has been contributing significantly towards producing an inquiring society and fast growing knowledge economy. These numerous schemes cover a wide range of scientists (aging from 15 years to 65 years). Human Resource Development Group of CSIR has been contributing significantly towards producing an ‘inquiring society’. The various programmes and activities of the Group relate to: Identifying budding talent having aptitude and aspirations to work for the generation of new knowledge and technology; Funding of extra mural research; Development of S&T manpower; Nurturing young talents; Promoting excellence through awards and honors; and Encouraging interaction among scientists.142

These programmes cover a wide range of S&T disciplines and age groups and are undertaken through a true Team India partnership i.e., with active involvement and participation of eminent scientists and experts from academia, industrial R&D units, S&T departments, etc.

2.23.5 Indian Council of Medical Research143

The Indian Council of Medical Research (ICMR), New Delhi, the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the

142 Council of Scientific and Industrial Research, HRD, India http://www.csisrhrdg.res.in/at_glance.htm
143 Indian Council of Medical Research, ICMR, India, http://www.icmr.nic.in/
oldest medical research bodies in the world.

As early as in 1911, the Government of India set up the Indian Research Fund Association (IRFA) with the specific objective of sponsoring and coordinating medical research in the country. After independence, several important changes were made in the organization and the activities of the IRFA. It was re-designated in 1949 as the Indian Council of Medical Research (ICMR) with considerably expanded scope of functions.

The ICMR is funded by the Government of India through the Department of Health Research, Ministry of Health & Family Welfare. The Governing Body of the Council is presided over by the Union Health Minister. It is assisted in scientific and technical matters by a Scientific Advisory Board comprising eminent experts in different biomedical disciplines. The Board, in its turn, is assisted by a series of Scientific Advisory Groups, Scientific Advisory Committees, Expert Groups, Task Forces, Steering Committees etc. which evaluate and monitor different research activities of the Council. The Council promotes biomedical research in the country through intramural as well as extramural research. Over the decades, the base of extramural research and also its strategies have been expanded by the Council.

2.23.6 Indian Council of Agriculture Research

The Indian Council of Agricultural Research (ICAR) is an autonomous body responsible for coordinating agricultural education and research in India. It reports to the Department of Agricultural Research and Education, Ministry of Agriculture. The Union Minister of Agriculture serves as its president.

The Committee to Advise on Renovation and Rejuvenation of Higher Education (Yashpal Committee, 2009) has recommended setting up of a constitutional body — the National Commission for Higher Education and Research — which would be a unified supreme body to regulate all branches of higher education including

agricultural education. Presently, regulation of agricultural education is the mandate of ICAR, Veterinary Council of India (Veterinary sub-discipline) and Indian Council of Forestry Research and Education (Forestry sub-discipline).

2.24 Conclusion:

Literature Review has taken through the books, journals, research papers and internet website for giving us full information about career, career development and retention of research employees. There is lot of material on Career, Career Development and Retention of employees other than Research Employees working in the autonomous bodies of the government of India. The Government Departments have reviewed these issues in their annual reports, which have been reviewed in this chapter. The literature review clearly indicates a research gap for the topic selected for this research study.