Chapter I
CHAPTER – I

INTRODUCTION

The present world is a highly competitive one. Everyone is striving to implicate a new formula in their product so as to enhance its quality and to distinguish from others. It helps them to keep their good will and to achieve their goal in time. According to Swami Vivekananda quote’s that we will be of what we presume. The industrial sector, it precipitates the impact of raw material in the finishing product. Having a high caliber machines and man power, one cannot make a quality product to the quality of raw material is used. This is so common in all fields specifically in sports. Now a day, the performance of sports participants is an ever changing one because of new innovations in methods used for training and identification the player or athlete. In Europe and in western countries, players and athletes have been located scientifically with the expert team members from the field of physical education, coaching, biomedical engineering, anthropometry, exercise physiology and psychology. Such a mechanism of filtering helps in identifying the quality person for participating in sports. When such a quality person is processed with scientific training, it saves time and energy in terms of coaching and training and aid the athlete to reach their goal in time.

Hence, India the second biggest in human resources in the world should come forward to locate the persons to fit in all aspects rather than selecting the athlete or player by their one timely achievement in competition, that too preferably in the early age. In addition to that, the factors to be considered while spotting the sports person in the early age are: geographical conditions, socio economic conditions and family history. The geographical condition is one of the foremost factors that determine the individual’s physical, motor fitness, anthropometric, physiological, and psychological aspects, since an
individual is biologically accommodated. Geographically, people can be classified as people living in plain areas, hill area and coastal area. The plain area, hill area, and coastal area differ from each other in physical and environmental structure. Such a structural variation existing among these areas would have significant impacts in the living conditions of people, which results vary in the physical, physiological, and cultural aspects. As for as sports participation is concerned, though the government has announced many schemes, to promote the sports population, so far very meagre amount of participants only hailed from the hill and coastal areas.

In fact, observable and most important one is the human resources in these areas are highly potential in the factors needed to excel in sports. Knowingly or unknowingly, people from coastal and hill areas are lesser in sports participation than the participants from plain areas. Evidence is the domination of Kenyans in long distance races. Geographically, Kenya is a country mostly with hill areas and very ups and down in nature. The people of this country prefer walking to reach the place they want, rather than any kind of transport. Such a geographical structure helps them to have the physical and physiological strength required to excel in sports. Likewise, in coastal area people also prefer walking and running to meet their day to day work since the structure of the coastal area being sand which is not so easy to use vehicles for the transportation. The natural form of coastal area makes the individuals to be sound in factors determining the performance of sports and games.

In addition to this, psychologically and sociologically, the living conditions of these areas inculcate the qualities of cohesiveness, intact, mental toughness, resilience and control over anxieties. Hence, by utilizing such type of natural gifted persons for sports, the physical education teacher, director, coach can have the desired results in time. With these perspectives, the present study has been carried out and title “Geographical based analysis on factors
determining the performance of sports among school boys”. The structure behind the theme of the study has been explained in this chapter in terms of structure and function of coastal area, factors to be analysed namely anthropometric, physical, motor, physiological how far influenced by the geographical structure of coastal area.

1.0 Coastal area of India

India has a coastline of about 5500 km from the mainland and about 2000 km in its offshore islands. The coastal area of the country is blessed with a vast network of backwaters, estuaries, creeks, lagoons and specialized ecosystems like mangroves and coral reefs. It has vast beaches all along the coast. The biodiversity in the coastal waters, Gulf of Mannar and Kutch, in the waters of Andaman, Nicobar and Lakshadweep islands and in the specialized ecosystems like chilka lake, mangroves along the east coast are significantly high. More than 5000 species of marine flora and fauna have been reordered so far the coastal and marine waters of the country. There is an urge to preserve, conserve and protect the coastal habitats and the marine environment from all made activities. The country is blessed with vast stretches of beaches along its coastline. The beaches and the adjoining land are being extensively for recreation, relaxation and for creating attractions like amusement parks etc.

The coastal area is the interface between the land and the sea. Characterized by high biological productivity and biodiversity, coastal areas are home to at least 13 coastal systems and are governed by physical, chemical, and biological processes. They contribute to the development of maritime trade and livelihood to millions of coastal inhabitants. The coastal areas provide a continuous supply of good fish, oil, gas, minerals, salt, and construction materials and services shoreline protection, sustaining biodiversity, water quality maintenance, transportation,
recreation, and tourism. Coastal areas are also very accessible, making them centuries of human activity, where people live, derive their recreation and their means of livelihood (http://www.fao.org).

1.0.1 Characteristics of Coastal Zone

Coastal zone plays an important part of people’s life. As a comparison, coastal zone represents 10% of the total earth surface, but inhibited by 50% of the population. A lot of benefits can be derived from the coastal zone. They serve as a purpose of transport, food supply, livelihood, energy, medicine, as well as recreation. Among the activity that vastly dominates the coastal zone includes industry, agriculture, fisheries, aquaculture, poultry rearing, urban development, residential, port and shipping, and mining. Among economic benefits and resources that is vastly available in the coastal zone includes fish, agriculture and poultry for food, mangrove for construction or fuel, mining for raw material supply and industry.

Economic and Environmental Importance of Coastal Areas

Favourable biophysical and climatic conditions, together with the ease of communication and navigation frequently offered by coastal sites (by sea or up river valleys), have encouraged human settlement in coastal zones since prehistoric times.

Economic role

Many of the world's major cities are located in coastal areas, and a large portion of economic activities, with the exception of agriculture, is concentrated in these cities. The coastal zone is an area of convergence of activities in urban centres, such as ship in major ports, and wastes generated from domestic sources and by major industrial facilities. Thus, traditional resource-based activities, such as coastal fisheries, aquaculture, forestry and agriculture, are found side by side with activities such as industry, shipping and tourism.
The potential for economic opportunities in coastal cities is a strong, attractive force, fuelling immigration, often from economically depressed rural areas. As a result, in the future much larger, younger populations can be expected in the coastal areas of developing countries. These future coastal residents will demand employment, housing, energy, food, water and other goods and services, thus presenting a substantial development challenge.

Against this demographic backdrop, coastal areas are extremely important for the social and economic welfare of current and future generations, as coastal resources support key economic and subsistence activities. The economies of most developing countries are currently very dependent on natural resources, for agriculture, fisheries and forestry subsectors, Bourre J and Paquette P (2008) mining, oil and gas extraction, marine tourism and ocean transport. Many of the world's most productive agricultural areas are located in river deltas and coastal plains. In particular, the deltas' food productivity Ruxton CHS et.al., (2005) exceeds local consumption needs and eventual delta disturbance can result in national economic shock waves that reach far beyond the delta. Although, in the future, coastal areas will become more urbanized, and the economies of developing countries will undoubtedly diversify to some extent through industrialization, dependence on coastal resources is likely to remain strong. Industrial development often entails the processing of agricultural, fishery and forestry products, together with oil refining and textile manufacture. These diversified economic activities are often also dependent on coastal resources and, as economic diversification increases and makes the component sectors more interdependent, conflicts over natural resources and the environment will tend to develop.

**Environmental role**

Ecologically Coastal areas are also important as they provide a number of environmental goods and services. The peculiar characteristic of coastal
environments is their dynamic nature which results from the transfer of matter, energy and living organisms between land and sea systems, under the influence of the primary driving forces that include short-term weather, long-term climate, secular changes in sea level and tides. Marine, estuary and coastal wetland areas often benefit from flows of nutrients from the land and also from ocean upwelling which brings nutrient-rich water to the surface. They thus tend to have particularly high biological productivity. Moreover, coastal areas frequently contain critical terrestrial and aquatic habitats, particularly in the tropics. Such habitats together comprise unique coastal ecosystems, support a rich biological diversity and frequently contain a valuable assortment of natural resources. It is estimated that 90 percent of the world's fish production is dependent on coastal areas at some time in their life cycle. In addition, these areas support large numbers of migratory and non-migratory waterfowl and shorebirds, and endangered reptiles, such as turtles and alligators. The advantages of maintaining their biological diversity have been formally recognized. Brenna JT et.al., (2009)

Physical features of coastal ecosystems, such as reefs and belts of mangrove, are important for the mitigation of the effects of natural disasters, such as storm-tide surges, shoreline retreat or floods. These features also play an essential role in natural processes, such as land accretion, and help to control coastal erosion and other damage arising from wind and wave action.

Even when coastal areas do not provide unique biological ecosystems, their location at the sea/land interface has recreational and aesthetic values which, in many countries, support valuable tourism activities, as well as providing attractive sites for industrial development and human settlements. The recreational and aesthetic values of coastal areas are increasing in developing countries as coastal tourism developments and domestic demand rises with increasing real incomes. Unique and appealing vistas, sandy and
rocky beaches, pristine blue water, wetlands and coastal forest, and the associated wildlife, coral reefs and multiple recreational activities supported by these areas are major attractions of coastal areas.

1.0.2 Geography and Climate of Study Area - Thoothukudi

The study area of the present study is villages nearby five kilometers form the coastal area of Thoothukudi District. Thus the Geography and Climate of Study Area of Thoothukudi are described as follows. Thoothukudi is a port town situated in the Gulf of Mannar about 125 km (78 mi) North of Cape Comorin and its environs form part of the coastal belt, which forms a continuous stretch of the flat country relieved here and there by small rock outcrops. The region, surrounding Thoothukudi is liberally dotted with rain fed tanks. Red soils found on the southern side of the Tuticorin town is composed quartz and variable quantities of fine red dry dust. The port is an all weather one. The bay formed by the Hare Island, Devils point and the mainland gives ample protection to the lighters from monosonic weather. Rudkowska I et.al., (2010)

Thoothukudi is located at 8.53°N 78.36°E. Thoothukudi is located in South India, on the Gulf of Mannar, about 540 km (340 mi) south of Chennai and 125 km (78 mi) north of Kanyakumari. The hinterlands of the port of the city are connected to the districts of Madurai, Tirunelveli, Ramanathapuram and Tiruchirapalli. The city, mostly has a flat terrain and roughly divided into two by the Buckle channel. Being in the coastal region, the soil is mostly clay, sandy and the water table varies between 1 m (3.3 ft) to 4 m (13 ft) below ground level. The city has loose soil with thorny shrubs in the north and salt pans in the south. The city experiences tropical climatic conditions characterized by immensely hot summer, gentle winter and frequent rain showers. Summer extends between March and June when the climate is very humid. Tuticorin registers the maximum temperature of 39 °C (102 °F) and the minimum temperature of 32 °C (90 °F).The city receives adequate
rainfall during the months of October and November. The city receives around 444 mm (17.5 in) rainfall from the Northeast monsoon, 117.7 mm (4.63 in) during summer, 74.6 mm (2.94 in) during winter and 63.1 mm (2.48 in) during the South-west monsoon season. The coolest month is January and the hottest months are from May to June. The city has a very high humidity being in the coastal sector. (Ait-yahia D et.al., 2003)

The 21 islands between Thoothukudi and Rameswaram shores in the Gulf of Mannar are notified as the first Marine Biosphere Reserve of India. About 36,000 species of flora and fauna exist in the region covered with mangroves, sandy shores, sea grass beds that are conducive for turtle nesting. (Ait-yahia D et.al., 2005) and (Ait-yahia D et.al., 2003). The region around the Thoothukudi shores are home to rare marine flora and fauna. Coral reefs and pearl oysters are some of the exotic species while algae, reef fish, holothurians, shrimps, lobsters, crabs and Mollusca are very common. (Ait-yahia D et.al., 2003) and (Zalloua PA et.al., 2007) Out of 600 recorded varieties of fish in the region, 72 are found to be commercially important (Holick MF 2007). The thermal discharge from the thermal plants and excessive brine run off from the salt pans impact the flora and fauna in the region to a large extent. (Zalloua PA et.al., 2007) and (Munns C et.al., 2006)

1.0.3 Coast Area of Tamil Nadu

The coastline of Tamil Nadu is about 900 km long. Increase in population exerts pressure on the coastal zone by way of commercial and industrial exploitation. The pressure on urban areas has increased a lateral migration of population, concentrating more towards coastal zone. In the map of India, one can observe that the southern half of the country looks like a triangle and is surrounded by water on three sides. This makes it a peninsula. This is also called Peninsular India. The presence of the sea on three sides has
given India a very long coastline. Cities like Mumbai, Cochin, Chennai, Kandla, etc., are some of the main ports of India. Because of its size and diversity, we will divide the coastline into a western and eastern part and then study it.

Deejay Sam (2011) The Eastern Coastal Plains stretches from Kanniyakumari in the south of West Bengal in the east. They include the coastal regions of Tamil Nadu, Andhra Pradesh, Orissa, West Bengal and the union territory of Pondicherry. The southern half of the East Coast is called the Coromandel Coast which includes coastal Tamil Nadu. The river Kaveri which flows through Karnataka splits into many small branches here before finally flowing into the sea. The Mahanadi is another major river of the Eastern Coastal Plains. It flows through Orissa and forms a delta before it enters the Bay of Bengal. As for the climate in the Eastern Coast is concerned, parts of Tamil Nadu receive rain in October. In other places, winter is mild and people do not need woollens. The summer months are warm, but the sea breeze cools the land and prevents it from getting too hot. The rains along the Eastern Coastal Plains are heavy (http://www.preservearticles.com/201101032426/complete-information-on-the-lifestyle-of-people-living-in-the-western-coast-of-india.html.)

The lifestyle of people living in the eastern coast is mainly relied with agriculture. Agriculture is the main occupation of the people living in this region. Rice, cereals, coconut, groundnuts and sugarcane are grown on the Coromandel Coast. Tea is planted on the slopes of the Nilgiri Hills. Sandalwood, rubber and timber are the main forest products. Many industries and rich deposits of iron ore, copper, bauxite and limestone are found here. Fishing and farming are other occupations.

1.0.4 Coastal impacts on human health

The coastal impacts on human health is described in term of its influence of on physical health, mental health, and physiological aspects of
human beings. Coastal area is a natural wonderland. People will find forests, farms, fresh water rivers, numerous national and provincial parks and marvelous ocean vistas. According to European Centre for Environment & Human Health, Peninsula College of Medicine and Dentistry, University of Exeter, that people living near the coast tend to have better health than those living inland. Previous research has shown that the coastal environment may not only offer better opportunities for its inhabitants to be active, but also provide significant benefits in terms of stress reduction. Another recent study conducted by the Centre in collaboration with Natural England found that visits to the coast left people feeling calmer, more relaxed and more revitalized than visits to city parks or countryside. One reason those living in coastal communities may attain better physical health could be due to the stress relief offered by spending time near to the sea.

Besides, coastal zone resources are so attractive to people shores around the world are focal points for various human activities. The principle forms of anthropogenic activity in the coastal zone are: fishing; aquaculture; coastal agriculture, forestry, hydro-technical engineering and coastal construction, mining, shipbuilding (in dockyards), oil extraction, transfer and transportation, electric power generation, cabotage (coastal navigation), seaport operation, naval operations, tourism and recreation. The sum of all these activities forms the anthropogenic pressure experienced by the coastal zone (Medical News Today, 2012).

The main food item of coastal area people is sea foods, which enhance the essential nutrient and improves the circulation and keep lungs stronger, which is the foremost one for the sportsman to excel in performance. Fish is also a powerful muscle building food because it is low in fat, high in protein
and high in omega 3. Although fish is slightly more expensive than the other sources, having fish twice a week is good enough. The fishes that are high in protein are lobster, haddock, mullet and saithe.

Research over the past few decades has shown that the nutrients and minerals in fish, and particularly the omega 3 fatty acids found in pelagic fishes, are heart-friendly and can make improvements in brain development and reproduction. This has highlighted the role of fish in the functionality of the human body. http://en.wikipedia.org/wiki/Fish

**Health benefits of sea foods-Physical**

Current advice from the government and health organizations recommends eating two seafood meals each week. Scientists from government and universities, and health care professionals have all concluded that for most people the overall benefits of this level of seafood consumption outweigh potential food safety risks. Seafood is a nutrient rich food that is a good source of protein, vitamins and minerals. Scientific studies continue to explore the relationship between the unique type of fat found in seafood, the omega-3 fatty acids DHA and EPA, in the prevention or mitigation of common chronic diseases. Click on the “Seafood and Nutrition” tab to learn more (http://seafoodhealthfacts.org/)

Seafood provides the body with many essential nutrients which keep us running smoothly, including iodine, selenium, zinc and potassium. Iodine is important for the thyroid gland, and selenium makes enzymes which can help to protect us from cancer. Fish and shellfish are also excellent sources of many vitamins, including vitamins A and D. Research has shown that eating fish and shellfish regularly is beneficial to our bodies in many ways; In human body fish as a daily intake or very often will be beneficial in terms of lowering the heart diseases, clearing the vessels, serves as essential nutrients, increase the power of
the brain, reducing the joint related diseases and enhance the efficiency of respiratory system. Each one of these is explained briefly as follows (http://www.seafish.org/eating-seafood/seafood-for-health/health-benefits)

In lowering the heart related diseases, previous studies evidencing that an extra portion of fish every week can cut risk of heart disease in half. Seafood is low in saturated fat and high in omega-3, (which can both) protect the heart from disease and lower the amount of cholesterol in the blood. By clearing the vessels eating fish can improve your circulation and reduce the risk of thrombosis. The EPA and DHA - omega-3 oils - in seafood can save your body from having to produce eicosanoids, a hormone-like substance which can make you more likely to suffer from blood clots and inflammation.

As for as sea food impact of joint related diseases, eating fish as a regular part of a balanced diet has been shown to ease the symptoms of rheumatoid arthritis, a condition which causes the joints to swell up. Recent research has also found a link between omega-3 fats and osteoarthritis, suggesting that eating more seafood could help to prevent the disease.

In vision of human beings, eating oil-rich fish regularly can help to keep the eyes bright and healthy. A recent study has suggested that omega-3 fatty acids can help to protect the eyesight of those suffering from age-related macular degeneration (AMD), a condition which causes the retina to degenerate and the eyesight to become blurred. Fish and shellfish also contain retinol, a form of vitamin A which boosts night vision.

**Role of Seafoods in Psychological aspects**

Psychologically seafood may also play a large part in preventing depression; research has highlighted the links between low omega-3 levels and a higher risk of depression. Seafood could also help us to avoid Seasonal Affective Disorder (SAD) and post-natal depression. The human brain is
almost 60% fat, with much of this being omega-3 fat. Probably for this reason, research has indicated that people who eat plenty of seafood are less likely to suffer dementia and memory problems in later life. DHA, an omega-3 fat found in seafood, has also been linked to improvements in children's concentration, reading skills, behavior, and Attention Deficit Hyperactivity Disorder (ADHD).

**Role of Seafoods in Physiological aspects**

The role of sea foods in physiological aspects is as follows. In this analysis, how far the sea foods are rich in vitamins and minerals in human body which results in desirable changes on functional aspects of human beings. Some of the nutrients such as protein, calcium, vitamins (A,D,K,E) iodine and Iron are described by its nature of the structure and functions of the human body along with their sources in sea foods. Protein is one of the main nutrients, is now recognized as being more complex than long realized roles of maintenance of bodily structures including muscles, bones, fingernails and hair. Protein, peptides and amino acid derivatives are important components in bone health, regulation of body composition, glucose metabolism, satiety, cell signalling, gastrointestinal health and bacterial flora (Millward DJ et.al., 2008). Such valuable nutrients of protein available rich ion seafoods. Consumption of seafood protein has been associated with increased insulin sensitivity in diabetics (Ouellet V et.al., 2007) and Von post-skagegrd (M et.al., 12-13), reduced inflammation (Rudkowska I et.al., 2010) and animal studies consistently revealing that seafood protein results in lower blood pressure (Demonty I et.al., 2003) and (Ait-yahia D et.al., 2003) (15-18). Most commonly consumed items of seafood are rich in complete protein. Following this, the sources of vitamins such as A,D,K,E,B, from the sea foods is as follows.

Seafood is a good source of calcium and vitamin D. Research has found that increasing consumption of seafood in the diet significantly improves bone
mineral density in women (Zalloua PA et.al., 2007). Vitamin D is important in regulating calcium and phosphorous in bone mineralization. The roles of vitamin D in regulating bone mineralization and absorption of calcium inherently make vitamin D important in the prevention of osteoporosis. Researchers have identified that dietary vitamin B12 sourced from fish is more bio available than that from meat and eggs (Vogiatzoglou et.al. 2009). Most fish and shellfish contain vitamin B12. Clams, octopus, oysters, fish and fish roe are excellent sources of vitamin B12 (Stabler and Allen, 2004). Dietary intake of fish has been linked to significant improvements in plasma B12 status. Vitamin B12 is important to DNA synthesis, red blood cell and neurological function. Deficiency of vitamin B12 can be associated with megaloblastic anaemia, neurological disorders, myelopathy, memory impairment, dementia, depression and cerebrovascular disorders (Vogiatzoglou et.al. 2009).

Vitamin A and E though the best marine sources are oily fish. Vitamin A plays an important role in supporting normal vision, reproduction, bone growth, immune functions and healthful maintenance of the eye, respiratory and urinary tract linings, the skin and mucous membranes (Ekweagwu et.al, 2008). Most fish and shellfish contain the highest marine source of vitamin E is oily fish. Vitamin E is a highly efficacious antioxidant that is important for the skin, nervous system, heart and circulatory system. Although deficiency in vitamin E is uncommon, the various forms of vitamin E are protective of vitamins A and C by preventing their oxidation (Ekweagwu et.al., 2008). Vitamin E is found in oils, nuts and green leafy vegetables (Ekweagwu et.al. 2008). Following the analysis of protein and vitamins, sea foods rich in some of the minerals such as Iodine calcium and iron are explained here.

Iodine is vital for the effective functioning of the thyroid gland and thyroid hormone production, thereby having a profound influence on facilitating normal growth, metabolism, cell oxygen consumption and the
development of the central nervous system. Iodine is found in most seafood, with shellfish containing the most abundant quantities. Further, fish and seafood have the highest concentration of iodine relative to other foods commonly consumed in most diets (Gunnarsdottir et al., 2010). Seafood as a part of a healthy diet will improve iodine status.

**Calcium**

Adequate dietary calcium is required throughout life to prevent low bone mineral density, increased risk of fragility fractures and osteoporosis at a mature age (Straub, 2007). Bony fish such as sardines and tinned salmon are very rich in calcium. Intakes of seafood greater than 250g per week, have been associated with greater bone mineral density (Zalloua et al., 2007).

**Iron**

Iron plays a vital role in facilitating the transportation of oxygen throughout the body within the hemoglobin complex and is associated with growth, healing and immune function. It is also critical for energy production within cells and DNA synthesis. Research suggests that Australian women in particular may not be consuming adequate iron, and increasing the consumption of iron rich seafood within a balanced diet can play an important role in addressing this imbalance (Ahmed, et al., 2008). Thus the nature and functional aspects of coastal area along with its association on human health presented. Following this, anthropometric one of the factor that has significant impact over sport performance is presented with its need, nature and association with the sport.

1.1 **Anthropometry**

Anthropometry is a branch of science concerned with comparative measurements of the human body, its parts, and its proportions and composition. It is the study of measurement of the human body in terms of the dimensions
of bone, muscle and adipose tissue. Anthropometry has been used to assess the gross structure and function. The physique and body composition, including the size, shape and form are known to play a significant role in this regard. At present, sportsman for superior performance in any sports is selected on the basis of the physical structure and body size.

Anthropometric measurements are widely used to assess and predict performance in various sports. Anthropometric measurements and morphological characteristics play an important role in determining the success of a sports person (Wilmore & Costill, 1999; Keogh, 1999). An athlete’s anthropometric and physical characteristics may represent important prerequisites for successful participation in any given sport (Gualdi-Russo & Zaccagni, 2001). Indeed, it can be assumed that an athlete’s anthropometric characteristics can in some way influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport (Carter & Heath, 1990).

Therefore, it is of practical relevance and importance to identify those skeletal characteristics that will favour a specific sport. The changeable (body composition) and unchangeable (skeletal size, shape and proportion) anthropometric characteristics predisposing to success will differ from sport to sport. Bale (1986) suggested that size, shape and body composition play an important part in providing a distinct advantage for specific playing positions, especially at the elite level of competition where there is a high degree of player specialization. This suggests that the anthropometric characteristics for success may not only differ from sport to sport, but also within different playing positions in team sports. The knowledge of anthropometric characteristics also allows the athlete and the coach to make adaptations to his/her training regime to attain the optimal physical attributes for best performance.
Anthropometric measurements play an important role in the performance of games and sports in the national or international competitions; there is a very less margin to take the top positions. Physique of an individual helps a lot to achieve better performance and to get refers top positions. Physique refers to the size, the shape and the form of an individual. Anthropometric measurements, physiological variables and psychological trait effects performance by improving fitness, technique and tactics. A number of sports scientists have concluded that top level performance in a particular event demands particular type of body size and composition. Anthropometric measurements were central concerns of the first phase of the scientific are of measurement, which began in the 1860s.

In sports, anthropometric methods are widely applied in the recruitment of potential athletes. Different sports have different anthropometric characteristics, therefore specific anthropometric variables should be used for talent identification in different sports. In recent past years, the selection and development of talent in sports have been gaining emphasis. Of course it involves integral approach of different sports science specialists. However, the role of anthropometry as a sports science is perhaps one of the most crucial in this regard. This is essential because the physique, body composition, physical growth and one’s motor development are of fundamental importance in developing the criteria of talent selection and development in sports. (Sodhi, 1991).

Actually Hippocrates first realized that fact and classified human beings according to two basic physiques – long and thin, or short and thick. Kretschmer, the father of modern body or somatotyping, defined three types by adding an in between and referred to them as asthenic (lean), athletic, and Pyknic (heavy) (Clarke and Clarke, 1989).

According to János Mészáros et al. (2000) sport anthropometry has developed from the techniques and results of general physical anthropology.
Thus, in the beginning, the main questions and methods were also similar to those of general physical anthropology, only the investigated subjects were taken from a different population. Following the initial, mainly descriptive and comparative, phases of data manipulation, the predictive functions of sport anthropometry have also developed. The analytical approach in sport anthropometry has only become dominant during the past 10 years. A clear recognition of the relationship between structural characteristics and functions can beyond the scientific importance of the matter – help, sports practice in both the selection of talented youngsters and the process of athletic preparation. The most recent tendencies in sport anthropometry attempt to answer such questions that cannot be connected to the direct and traditional measurements of physical anthropology. An analysis of the relationship between inherited characteristics (physique and metabolic pathways, functional regulation during exercise, etc.) means a new challenge for sport anthropometry.

1.2 Physical Fitness

Physical fitness refers the ability of an individual to handle the task performed in everyday life with enough energy in reverse to enjoy leisure pursuits and deals with emergencies (Margaret, 1995). Having the ability to perform daily tasks vigorously and alertly, with energy left for enjoying leisure time activities and meeting emergency demands. Physically fit helps the person to bear up, to withstand stress, to carry on in any circumstances; whereas an unfit person could not manage it without good health and well-being. Besides having the physical fitness one can maintain the various systems of the body healthly and making them function effectively (William, 1994). Physiologically regular physical activity increases the amount of oxygen delivered to the brain, which in turn, increases the learning capacity of the respondents. Regular practice of an exercise regulates the oxygen flow to the brain easily which enables them to make decisions with the help of cognitive functions (Charles, 1970).
Motor Fitness components

The select motor fitness components such as speed. Strength and explosive power used in the study are described here with its association with sport performance.

Speed

Speed is the ability to move quickly across the ground or move limbs rapidly to grab or throw. Speed is not just how fast someone can run, but is dependent on their acceleration (how quickly they can accelerate from a stationary position), maximal speed of movement, and also speed maintenance (minimizing deceleration). Movement speed requires good strength and power, but also too much body weight and air resistance can act to slow the person down. In addition to a high proportion of fast twitch muscle fibers, it is vital to have efficient mechanics of movement to optimize the muscle power for the most economical movement technique. Speed is one of the main fitness components, important for success in many sports. For some athletes such as Track and Field sprinters, sprint swimmers, cyclists and speed skaters, speed is the most important aspect of fitness. In many other sports, including team field sports, good speed is also very important as part of the overall fitness profile (Hardayal Singh, 1991). Most sports and activities require some form of speed. Even long distance running often requires a burst of speed to finish the race ahead of your competitors.

Leg Strength

Strength underlies motor performance. In an isolated sense, strength is the capacity of a muscle or group of muscles to exert maximum pressure, or force, against a given resistance in a limited period of time. Strength should not be considered a product of only muscle contractions. It is, in fact, a product of voluntary muscle contractions caused by the Neuro-muscular system.
(Hardayal Singh, 1996). Strength, or the ability to express force, is a basic physical characteristic that determines the performance efficiency in sports. Strength is also perhaps the most important motor ability in sports as it is a direct product of muscle contractions. All movements in sports are caused by muscle contraction and, therefore, strength is a part and parcel of all motor abilities, technical skills and tactical actions. Leg strength has been considered as the most important conditional ability. It has been the most significant factor to enhance sports techniques and performance. Since all sports movement is created by the contraction of muscle, therefore, leg strength is an important component of various conditional abilities, skills and tactical actions. (Uppal 2001)

**Leg Strength for Sport Performance**

Strength, speed and endurance are the important abilities for successful performance. The dominant ability is the one from which the sport requires a higher contribution. Most sports require peak performance in at least two abilities. The relationships between strength, speed, and endurance create crucial physical athletic qualities. A better understanding of these relationships will help to understand power and muscular endurance and help to plan sport-specific strength training. Combining strength and endurance creates muscular endurance, the ability to perform many repetitions against a given resistance for a prolonged period. Power, the ability to perform an explosive movement in the shortest time possible. Results from the integration of maximum strength and speed. The combination of endurance and speed is called speed-endurance. Agility is the product of a complex combination of speed, coordination, flexibility and power as demonstrated in gymnastics, wrestling, football, soccer, volleyball, baseball, boxing, diving, and figure skating. When agility and flexibility combine, the result is mobility, the ability to cover a playing area quickly with good timing and coordination. (http://www.coachr.org).
According to Vern Gambetta the legs are the primary source of power in many sports. In the great majority of situations they function as part of a closed kinetic chain which means that one leg is always in contact with the ground. Without functional leg strength the athlete cannot have speed, strength, power, or suppleness to perform. We must think of the legs as a functional unit of the whole kinetic chain. "Function is a miraculous and complex combination of systems that are linked and react with each other. In order to understand function as a whole, the parts and components of, function must be appreciated." (Gary Gray) The leg muscles work together to reduce and produce force in the most effective manner for the required activity.

**Explosive leg power**

Explosive power comes from the development of speed and strength. Paavolaiken et. al. (1999) suggested that muscle power is the ability of the neuromuscular system to produce power during maximal exercise when glycolytic and oxidative energy production is high and muscle contractility may be limited. According to Matavulj, 2001, the strength of the muscles in the limbs is moving and supporting the weight of the body repeatedly over a given period of time. In terms of dynamic strength, sometimes it has been called velocity or speed([http://www.sportsmd.com](http://www.sportsmd.com)). Explosive leg power is an essential characteristic for improved sports performance. High-intensity actions such as sprinting, jumping, throwing, striking and changes of direction are commonplace in most individual and team sports. All of these actions require highly developed muscular power, allowing athletes to out-sprint or out-jump an opponent. In talent identification settings, vertical jump height, acceleration, sprint speed, and agility are often used as assessments of an athlete’s physical ability (Pyne, D.B., et al 2005). Maximising an athlete’s capacity to perform explosive muscular actions is therefore essential for any coach or trainer.
Muscular function in athletic movements rarely requires the use of eccentric or concentric muscle actions in isolation. Rather, explosive movements often involve a stretch-shorten cycle (SSC), where a muscle fibre is activated, stretched, then immediately shouted, producing greater muscle force and power than a concentric contraction alone. Theory suggests that the eccentric phase enhances performance by: a) allowing time for the working muscles to stiffen and develop force for the concentric contraction, b) enhancing the potentiation of contractile elements, c) utilising elastic energy harnessed during the stretching phase, and d) exploiting the stretch reflex, initiated upon the eccentric stretching of the muscle Cormie, P., M.R. McGuigan, and R.U. Newton 2011. In order to take full advantage of the SSC, the eccentric phase must be short and fast, and there must be an immediate transition between eccentric and concentric phases.

**Physical performance and sport**

Athletic competence refers to the integrated physical performance necessary for techniques and tactics enhancement and excellence in all kinds of physical exercises. The integrated physical performance involves anthropometric characteristics, physiological function, health and physical performance, among which physical performance is the most important athletic competence, while anthropometric characteristics, physiological function and health form a good basis for an ideal physical performance (Guo, 1999). Physical performance can be defined as a human body competence in strength, speed, endurance, agility and flexibility in playing sport. The performance is related not only with anatomical and physiological characteristics, but also with training level and nutritional condition.

Physical performance is a basis of mastering and the improving sports skills and achievements (Ye, 1995). Physical performance is virtually an integration of various body activity abilities for playing sport. Physical
performance forms the basis of sport skills. The improvement of sport-specific physical performance depends not only on the level of coaching, but also on the talent of the players. Liu (2006) pointed out that, as a criterion for physical conditioning and sport competence, physical performance on one hand relates to the muscle efficiency, and on the other hand reflects the function of various organ systems (Liu, 2006).

**Anthropometry and physical performance in sports**

Optimal anthropometric characteristics have been considered to be a pre-requisite for good performance in sports. As a result, studies (Carter, 1970, Hirata, 1966) have identified particular body type that is likely to lead to success in selected sporting events (Sharma and Dixit, 1985). Previous studies have also documented the physical performance and anthropometric characteristics of sub-elite and elite rugby league players to provide insight into the factors that are likely to limit and contribute to high performance (Gabbett et al., 2005, Gabbett, 2006, Meir et al., 2001, O'Connor, 1996).

**1.3 Physiology**

Physiology is the scientific study of function in living systems. Prosser, C. Ladd (1991). A sub-discipline of biology, its focus is on how organisms, organ systems, organs, cells, and bio-molecules carry out the chemical or physical functions that exist in a living system. Hall, John (2011). One among the physiology is human physiology. Human physiology seeks to understand the mechanisms that work to keep the human body alive and functioning, Hall, John (2011). Through scientific inquiry into the nature of mechanical, physical, and biochemical functions of humans, their organs, and the cells of which they are composed. The principal level of focus of physiology is at the level of organs and systems within systems. As the science of the functioning of all the organs and systems of an organism, it explains the system of the body to be fit,
they must function well enough to support specific activity that the individual is performing more over different activity make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurologic process which are specific to the activity.

Biologically, human beings are designed to be active creatures. It is important to be aware of the requirements for the good health and to recognize the importance of vigorous physical activity in the life. Regular activity increases muscle size, strength and power and develops endurance for straining work. Physical exercise contributes to improve the posture and appearance through the development of proper muscle tone, greater joint flexibility and good feeling of well-being. It generates pure energy and thus contributes to greater individual’s productivity for both physical and mental task. Physical fitness is not entirely a dependent exercise. Desirable’s living conditions also play an important role. (William, 1994). The knowledge gains over the human physiology helps the person to learn how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Exercise physiology is the study of how body’s structures and functions are changed as a result of exercise. It applies the concept of exercise physiology to training the athlete and enhancing the athlete’s sports performance. (Ajmer Singh, 2005). Exercise physiology is the scientific study of physiological changes in the athlete’s body with the effects of exercise, whether long term or short term. Different environmental changes, namely, altitude, climate, temperature, humidity, nutritional status, etc have some close associations with the optimal performance of an athlete. (Clarke and Clarke, 1987).

**Importance of Physiological Aspect in Sports Performance**

In sport high level of performance in is depend upon the physiological proficiency of an individual which is attributable to genetics, and determined
by training and other adaptations made by the athlete. Certain body types are well suited to particular types of athletic functions and movements. The Rift Valley of Africa, which includes countries such as Kenya and Ethiopia, has produced more world- and Olympic-champion distance runners than any other place on Earth, due to the slender, relatively long-striding people of that district, who live at altitudes in excess of 6,562 ft (2,000 m). These physical attributes have created a superlative human form for distance running. The people who live near the Baltic Sea in northeast Europe, including Lithuanians and Russians, possess tall, lean, muscular frames, ideally suited to sports (Shaver Larry.G. 1982).

The conflict between how much athletic ability is rooted in individual genetics as opposed to the influence of training and other factors is often expressed as "nature versus nurture." Although precise attribution between athletic nature and nurture are impossible, it is a generally accepted sport science proposition that genes represent approximately 50% of athletic variation in performance, with 50% attributable to both the individual athlete's response to training, as well as social factors, such as the support provided to the athlete in pursuit of his or her goals. For instance, the very tall northern European male, who at a height of 7 ft (2 m) would seem to be a far more attractive recruit to the sport of basketball than a person 5 ft 10 in (1.7 m). The gene-governing height present in the taller male represents a potential dominant physical factor. Coordination, agility, spatial sense, determination, resilience, and intelligence are all traits that are essential; each is one that may not be capable of developing in an athlete, irrespective of height. (Shaver Larry.G. 1982).

There are a number of critical training factors constructed upon the inherent individual physical traits that will influence athletic success. The ability to increase one's maximum oxygen uptake, expressed as VO₂ max,
is one such factor. A greater VO$_2$ max represents a correspondingly enhanced ability to convert the bodily fuel sources into energy. VO$_2$ max is a genetic characteristic that may be typically increased through training between 10% and 15%; exceptional athletes have experienced VO$_2$ max gains of 30%. It is also apparent that the importance of genetics in the prediction of athletic performance is less pronounced when the sport requires the development ofVO$_2$ of specific set of technical skills, placing primary emphasis upon efficient technique and error-free.

**Oxygen Consumption**

Oxygen consumption is one of the most commonly assessed variables in the study of exercise physiology. Knowledge of oxygen consumption permits, not only the precise determination of energy expenditure but also the measurement of the overall physiological stress imposed by exercise. Oxygen consumption (VO$_2$) is the amount of oxygen taken up and utilized by the body per minute. The oxygen taken into the body at the level of the lungs is ultimately transported by the cardiovascular system to the systemic tissues and is used for the production of ATP in the mitochondria of our cells. Oxygen consumption is dependent on the ability of the heart to pump out blood, the ability of the tissues to extract oxygen from the blood, the ability to ventilate and the ability of the alveoli to extract oxygen from the air. At rest, nearly all of the body’s energy demands are being met by aerobic metabolic processes, which require oxygen. The mitochondria are the site of aerobic metabolism in the cells (aerobic metabolism will be covered in greater detail in labs later this quarter). Ultimately, oxygen is the final electron acceptor in the electron transport chain, forming water in the process. As oxygen is being consumed, carbon dioxide is also being produced, and must be cleared from the tissues to the blood, and ultimately blown off in the expired air.
The maximal ability of a subject to take up and utilize oxygen is frequently referred to as their maximum oxygen consumption (VO₂max) or aerobic capacity. Because tests evaluating VO₂max stress the oxygen delivery (pulmonary and cardiovascular) systems and the oxygen consuming (tissues, especially muscle during exercise), VO₂max are frequently thought of as being synonymous with aerobic fitness, and it is one of several strong predictors of endurance performance.

**Pulse rate**

Normal pulse rate changes substantially from infancy to middle childhood. By age 12, the normal pulse rate approximates that of an adult. Pulse rates, like other vital signs, fall within a wide range because they change frequently in response to the body's needs. A normal resting pulse rate range for a 12-year-old is 50 to 100 beats per minute. This will remain the normal range throughout adolescence and adulthood. Regular exercise is important to keep 12-year-old's heart and body healthy. To benefit the heart, exercise must be vigorous enough to push the pulse into a target range. For example, a 12-year-old with a resting pulse of 75 will derive heart benefits from a pulse rate of approximately 135 to 180 beats per minute during exercise, notes the text "Fitness for Life: Middle School." The range varies slightly according to your child's resting pulse rate. Sometimes, during extremely strenuous activity, the pulse rate may rise even higher (http://www.livestrong.com/article/221212-the-normal-pulse-rate-for-a-12-year-old/)

### 1.4 Psychological Skills

Psychological skills refer the factors that are significantly influencing the person to drive energy either internally or externally, accommodating the stressful situations, confident over the activity engaged and concentrate over the cues intact with physical and environmental stimuli. Its impacts over the
sports performance is at par with the physical factors. Hence, the boys of coastal and plain area were assessed on select psychological skills so as to apprehend the influence of geographical structure. Thus the psychological skills such as motivation, confidence, anxiety control, mental preparation team emphasis and concentration used in the study are described here.

Motivation is one of the thirstiest areas of sport and exercise psychology (Roberts, 2001). Motivation is the thought, to be a combination of the drive within us to achieve our aims and the outside factors which affect it. With this in mind, motivation can be classified into two forms as intrinsic motivation and extrinsic motivation. Previous research evidencing that motivation significantly contributes to the student’s achievement and their sports involved (Good & Brophy, 2000). Besides, the research has also shown that people differ by their motivation for playing sports (Vallerand, 1997). According to self determination theory extends traditional notions of intrinsic and extrinsic motivation and includes the psychological needs for competence, autonomy and relatedness that are assumed to drive motivated behaviour.

Intrinsic motivation is a motivation from within that is a desire to perform well and succeed. Intrinsic motivation in sport is defined as enjoyment just from taking part in the favourite sport. There are three types of intrinsic motivation – to know, to accomplish and to experience stimulation. While the motivation to accomplish something, to reach personal achievement standards and to experience, the sports activity itself as simulative and encouraging (Pelletier et al., 2007) is more dominant in the sport. In sport it would be in the form of athlete’s desire to overcome the problem or task. Development of skills and habits to overcome that problem, rehearsal of successful habits until they are perfect, a feeling of pride and enjoyment in performing the skill and repeated goal setting in order to progress and maintain motivation.
Intrinsic motivation, reflecting enjoyment, interest and inherent satisfaction, is the clearest form of autonomy and reflects true self determination (Ryan & Deci, 2000). Importantly, Deci and Ryan (1985) suggest that when the needs for autonomy, competence and relatedness are satisfied, behaviours that may not have been initially intrinsically motivated are ‘taken in’ and internalized to become more autonomously regulated. For instance, an individual may initially take part in sport because of parental pressure and the threat of punishment (external regulation). In time, if the three needs are met, the individual may come to appreciate the value of the activity and want to take part (identified regulation), rather than feel they have to take part. Perceptions of autonomy are predictors of intrinsic interest in physical activity (Goudas et al., 1994).

Extrinsic motivation is a type of motivation comes from a source outside of the performer. These are things which can encourage the athlete to perform and fall into two groups: Tangible rewards: Physical rewards such as medals and money. These should be used sparingly with young athletes to avoid a situation where winning a prize is more important than competing well. Intangible rewards: Praise, recognition and achievements. Coaches use extrinsic rewards to additionally encourage young athletes in their efforts, although there is empirical data that, contrary to the expectations of coaches, using external stimulations causes a negative effect and additionally “undermines” intrinsic interest and enjoyment in the sport instead of contributing to intrinsic motivation (Lazarević, 2001). However, using extrinsic forms of stimulation is unavoidable in sports. The more fully an extrinsic stimulation is internalized and more successfully integrated in one’s self, the better basis for self-determination of behaviour and self-motivation will be (Mladenović, 2010a).
Anxiety

Anxiety is an emotional state, similar to fear, associated with arousal and accompanied by feelings of nervousness and apprehension. Commonly it is noticed in people of all age groups. It may be caused by a physical condition, mental condition, and effects of drugs or due to a combination of these. In addition to these there are many external factors that may contribute to anxiety. Anxiety can be classified into state and trait based on its nature. Thus state anxiety refers the athlete’s emotional state at any given time - variable from situation to situation, whereas trait anxiety refers the athlete’s disposition to interpreting a situation as threatening and responding with an increase in state anxiety. Athletes who have a high trait anxiety view more situations as more threatening than those with lower trait anxiety and so respond with a higher state anxiety. This is known as competitive trait anxiety. In measuring the anxious state, Sports, Competition Anxiety Test (SCAT) developed by (Rainer Martens 1980) is a reliable predictor of an athlete’s level of anxiety. Besides physiological measurements such as heart rate, sweating, muscle tension and oxygen uptake are the most indicators of anxious response of subjects.

Anxiety is a needed factor for human beings. As a factor of readiness and preparedness irrespective of sport participants everyone needs anxiety to complete the task at hand successfully. Here the level of anxiety is a deterministic factor. The level should be neither low nor high most preferably to be in the state of optimal level, which was the desired state to maintain the physical, physiological and psychological conditions in the desirable way. Since anxiety can seem like a major medical problem and/or symptom, it creates an additional worry for people like anxiety control, to figure out the difference between a real medical emergency and an anxiety-panic attack. Even healthy people sometimes have a hard time knowing the difference between the two.
Anxiety Control

Identifying when an athlete feels a particular emotion and understanding the reason for the feelings is an important stage of helping an athlete gain emotional control. An athlete's ability to maintain control of their emotions in the face of adversity and remain positive is essential to successful performance. Two emotions that are often associated with poor performance are anxiety and anger. Anxiety comes in two forms - Physical (butterflies, sweating, nausea, needing the toilet) and Mental (worry, negative thoughts, confusion, lack of concentration). Relaxation is a technique that can be used to reduce anxiety (Suinn, 1989). When an athlete becomes angry, the cause of the anger often becomes the focus of attention. This then leads to a lack of concentration on the task, performance deteriorates and confidence in ability is lost which fuels the anger - a slippery slope to failure.

Concentration

According to Nideffer (1993) concentration entails the ability to focus attention on the task at hand and not be affected or disturbed by internal or external distractions. Selective attention involves being able to choose to attend to specific things going on and to ignore others. To be successful in competitive situations, athletes must have the ability not to react or be disturbed by potential distractions. Instead, they learn how to focus attention and control thoughts. It's about being totally in the here-and-now. Peak performance occurs when athletes are able to voluntarily concentrate on the cues in their environment and perceive them to demand an action that is within their ability to execute.

Bull et al. (1996). One very useful approach to increasing focus and concentration is through the use of pre-performance routines. Such routines are commonplace among successful athletes and run the gamut from very subtle to
very elaborate and, sometimes, peculiar. One thing they have in common is accomplished athletes use them consistently, regardless of whether things are going well or not. Performance routines work for a number of reasons, including helping athletes block out irrelevant internal and external distractions by giving them something to focus on, assisting athletes relax by providing a sense of familiarity which helps remind them this is just another shot, serve, race, etc., and finally, providing athletes with a consistent approach to their sport which, in turn, helps maximize the potential for consistent performance.

**Confidence**

Confidence is also a mental area that is ripe for change. Confidence can be defined as how strongly a person believes in his ability to achieve his goals. Confidence is so important because individual may have all of the ability in the world to perform well. In reality, confidence is a skill, much like technical skills, that can be learned. Just like with any type of skill, confidence is developed through focus, effort, and repetition.

In sport a player will get nervous before competition because he believes that he will perform poorly. All of that anxiety hurts confidence even more because a player feels physically uncomfortable and there's no way he can perform well when he is so uptight. The negative self-talk and anxiety causes negative emotions. He feels depressed, frustrated, angry, and helpless, all of which hurt his confidence more and cause him to perform even worse. Such a negative self-talk, anxiety, and emotions, then hurt the player focus. Having low confidence, one will lose his focus and accumulated negativity hurts his motivation. To overcome this one should have a positive self talk that will enable him to be confident in the task he has. With the positive self-talk, a player / athlete may be relaxed and energized as he begins the competition. All of the positive thoughts and feelings motivate to perform. When thinking positively, riding an upward spiral, feeling relaxed and energized, experiencing
positive emotions, and are focused on performing best, going to have a lot of fun and likely going to perform well. Anything that counters belief in one’s ability to achieve his goals will hurt his confidence. The greatest disruption to confidence is a failure. Failure can mean making mistakes in a competition, Failure will cause to lose faith in one’s ability and cause him to become tentative or cautious. Failure can also mean having poor results in recent competitions. There is nothing more harmful to confidence than failure because it provides evidence that any confidence you may have is unjustified.

1.5 Objectives of the Study

The following are the objectives of the present study.

1. To identify the level of physical and anthropometrical aspects such as height, weight, arm length, forearm length, upper arm length, leg length, upper leg length, lower leg length, palm length, palm width, hip circumference, foot length, foot width, and thigh circumference.

2. To identify the level of motor fitness components of speed, strength, arm strength, leg strength, leg explosive power and shoulder explosive power.

3. To identify the level of physiological aspects such as oxygen level, pulse rate and breath holding capacity.

4. To identify the level of psychological skills such as motivation, confidence, anxiety control, mental preparation, team emphasis and concentration.

5. To study the influence of geographical aspects such as a coastal area and plain area on the factors such as physical, anthropometrical, motor fitness components, physiological, psychological skills that determine the performance of sports.
1.6 Hypotheses

Based on the objectives, the following hypotheses are formulated.

1. Geographical influences may exist, on the factors that are determining the performance of sports among the boys of coastal area and plain area.

2. Boys studying in the coastal area and plain area may not differ significantly with regard to physical aspects of height and weight.

3. Boys studying in the coastal area may have better performance than the boys studying in the plain area on select motor fitness components of speed, strength, arm strength, leg strength, leg explosive power and shoulder explosive power.

4. As for as anthropometrical aspects are concerned,

a. The boys studying in schools of coastal area may have higher in the palm length, palm width, hip circumference, foot length, foot width, and thigh circumference as compared to the boys pertaining to the plain area.

b. In the case of arm length, forearm length, upper arm length, leg length, upper leg length, the lower leg length, the boys studying in the schools plain area may be greater than the boys of coastal area.

5. Ecologically, the coastal area is better than the plain area. Thus, the boys studying in the schools of coastal area may be significantly higher than the boys studying in the schools of plain area on physiological aspects such as oxygen level, pulse rate and breath holding capacity.

6. Geographically human beings in the plain area planning their life cycles well in advance, as they are somewhat aware of the forthcoming situations compared to the coastal area since people of the coastal area have to accommodate with nature. Thus the boys studying in the schools of coastal area may be lesser in the selected psychological skills, motivation, mental preparation, and concentration than the boys of plain area.
Further, in the remaining psychological skills such as confidence, anxiety control, team emphasis, the boys of coastal area may be better than the boys of plain area.

1.7 **Significance of the Study**

The significance of the present study is as follows

Sport population in India is very small compared to its general population. With this very less population in sports, getting the sports persons fulfilling with all needed factors for sport performance is very rare. Thus the physical education teachers and coaches have been forced to select the individuals, even though they were aware of their maximum achievement in sport. Such a miserable situation prevailing in India can overcome only by increasing the base of sports population. One of the major objectives of this study is to measure the factors determines the sports performance of boys studying in schools of coastal area. The results of this may help them to understand their status which in turn motivates them to participate in sports. Geographically India has a long coastal line of about 7500 Kilometers, including that of its island territories (ISRO, 2012). People’s participation in sports from this area confidently strengthens the base of sports population. Hence the Government of India has to concentrate over these areas to initiate many schemes in the coastal area which is duly beneficial to the people and the country. Such a wider base of sports population significantly helps the people, physical education teachers, coaches and country in the following aspects.

1. It makes the avenue for sports participation among the boys studying in the coastal areas. The people of these areas may have an employment opportunity and to increase their socioeconomic conditions. Apart from the competitive aspects of sports, boys in the coastal area concomitantly learned the positive aspects of life skills, namely cooperation, self realization, accommodating stress and mental toughness.
2. Physical education teacher, coaches, and trainers, helps to understand the geographical influence in the factors determine the sports performance. Having the knowledge over the influence of geographical aspects, in future sports persons can easily be located and trained in the specific event.

3. In the country, it can have the person in the sports with high potential and find the place in the international medal tally in addition to having the healthy people. Thus economically save the money instead spending unnecessarily in training and coaching and enhance its economic conditions in all aspects.

1.8 Delimitations

The present study was confined into the following aspects

1. Subjects for the present study were confined to the boys studying in the schools of coastal area which were located within the two kilometer radius of sea shore. Thus totally the selected subjects were 445

2. The age of the subjects was fixed in the range of 11 and 12.

3. As physical variables, the present study was confined to the Speed, Strength, Arm strength, leg strength, leg explosive power and shoulder explosive power

4. As physiological variables, the present study was confined to Oxygen level, Pulse rate, Breath Holding capacity

5. In the present study for the anthropometric variables Height, Weight, Arm length, Leg Length, Fore Arm length, Upper arm length, upper leg length, lower leg length, palm length, palm width, thigh circumference, hip circumference, foot length and foot width
6. In measuring the motor fitness components, standardized test was used. Besides in measuring the pulse rate and oxygen consumption of subjects, it was confined to the tool of Pulse Oximeter which was a well established reliable instrument.

7. To measure the psychological skills of the subjects, the Psychological skill Inventory developed by

8. For studying the geographical impact on factors determining the sport performance, the present study was confined to Thoothukudi District as study area.

9. In selecting the subjects for the plain area, the students studying in the selected schools in Coimbatore were selected other than the hill area and coastal area. Thus totally for boys

1.9 limitations

The following factors were used as limitations in the present study.

1. Socioeconomic status of subjects used in the study was considered as a limiting factor.

2. Previous experience in sport is not taken into account in the present study.

3. The influence of the welfare of the people benefitted from the schemes implicated by government or non government agencies on criterion variables was considered as a limiting factor.

1.10 Operational Definition of Terms

The operational definition of terms used in the present study is as follows.

Coastal area

The coastal area is an area, geographically located within the radius of four kilometer distance from the sea shore.
Plain area

Plain area is an area geographically located away from sea shore and hills.

Anthropometric

Anthropometry is the measurement of body size and proportions. The measurements include body weight, height, circumference, skin folds thickness and bony widths and lengths (Heyward, 2006).

Height

The height of the subject is measured in centimetres while standing in erect position. The measuring scale used as a stadiometer. The chin of the subject and the head was held erect. The height was measured to the nearest centimetre. (Yobu, 2001).

Arm length

The arm length was the distance from the rod held by the subject tightly in his hands to the acromion process. (Clarke and Clarke, 1989)

Physical

According to Oxford dictionary (1988) the word Physical stands for ‘of the body’, ‘physical fitness’; a physical examination

Breath Holding Time

Breath holding time is defined as the duration of time through which one can hold his breath without inhaling or exhaling after a deep inhalation (Strukic, 1981).

Resting Pulse Rate

Pulse rate or heart rate is the rate of beats of the heart per minutes (Morehouse and miller 1976)