**Course: Population Education-I (6574) Semester: Autumn, 2021**

**Level: MA (EPM)/PGD(EPM)**

**ASSIGNMENT No. 2**

**Q.1 What are the different parameters of social systems unbalancing the population in different countries of South Asia?**

**ANS**

In [sociology](https://en.wikipedia.org/wiki/Sociology), **social system** is the patterned network of relationships constituting a coherent whole that exist between individuals, groups, and institutions.[[1]](https://en.wikipedia.org/wiki/Social_system#cite_note-:0-1) It is the formal [structure](https://en.wikipedia.org/wiki/Social_structure) of role and status that can form in a small, stable group.[[1]](https://en.wikipedia.org/wiki/Social_system#cite_note-:0-1) An individual may belong to multiple social systems at once;[[2]](https://en.wikipedia.org/wiki/Social_system#cite_note-2) examples of social systems include [nuclear family](https://en.wikipedia.org/wiki/Nuclear_family) units, [communities](https://en.wikipedia.org/wiki/Community), [cities](https://en.wikipedia.org/wiki/City), [nations](https://en.wikipedia.org/wiki/Nation), [college campuses](https://en.wikipedia.org/wiki/College_campus), [corporations](https://en.wikipedia.org/wiki/Corporation), and [industries](https://en.wikipedia.org/wiki/Industry_%28economics%29). The organization and definition of groups within a social system depend on various shared properties such as location, socioeconomic status, race, religion, societal function, or other distinguishable features.

The study of social systems is integral to the fields of sociology and public policy. Social systems have been studied for as long as sociology has existed.

**Talcott Parsons**

[Talcott Parsons](https://en.wikipedia.org/wiki/Talcott_Parsons) was the first to formulate a systematic theory of social systems, which he did as a part of his [AGIL paradigm](https://en.wikipedia.org/wiki/AGIL_paradigm). He defined a social system as only a segment (or a "subsystem") of what he called [action theory](https://en.wikipedia.org/wiki/Action_theory_%28sociology%29).[[4]](https://en.wikipedia.org/wiki/Social_system#cite_note-:2-4) Parsons organized social systems in terms of action units, where one action executed by an individual is one unit. He defines a social system as a network of interactions between actors.[[4]](https://en.wikipedia.org/wiki/Social_system#cite_note-:2-4) According to Parsons, social systems rely on a system of language, and [culture](https://en.wikipedia.org/wiki/Culture) must exist in a society in order for it to qualify as a social system.[[4]](https://en.wikipedia.org/wiki/Social_system#cite_note-:2-4) Parsons' work laid the foundations for the rest of the study of social systems theory and ignited the debate over what framework social systems should be built around, such as actions, communication, or other relationships.

**Niklas Luhmann**

[Niklas Luhmann](https://en.wikipedia.org/wiki/Niklas_Luhmann) was a prominent sociologist and social systems theorist who laid the foundations of modern social system thought.[[5]](https://en.wikipedia.org/wiki/Social_system#cite_note-5) He based his definition of a "social system" on the mass network of communication between people and defined society itself as an "autopoietic" system, meaning a self-referential and self-reliant system that is distinct from its environment.[[6]](https://en.wikipedia.org/wiki/Social_system#cite_note-6) Luhmann considered social systems as belonging to three categories: societal systems, organizations, and interaction systems.[[7]](https://en.wikipedia.org/wiki/Social_system#cite_note-7) Luhmann considered societal systems, such as religion, law, art, education, science, etc., to be closed systems consisting of different fields of interaction.[[8]](https://en.wikipedia.org/wiki/Social_system#cite_note-:1-8) Organizations were defined as a network of decisions which reproduce themselves; his definition is difficult to apply in terms of finding a real-world example.[[8]](https://en.wikipedia.org/wiki/Social_system#cite_note-:1-8) Finally, interaction systems are systems that reproduce themselves on the basis of communication rather than decision making.[[8]](https://en.wikipedia.org/wiki/Social_system#cite_note-:1-8)

**Jay Wright Forrester**

[Jay Wright Forrester](https://en.wikipedia.org/wiki/Jay_Wright_Forrester) founded the field of [system dynamics](https://en.wikipedia.org/wiki/System_dynamics), which deals with the simulation of interactions in dynamic systems. In his work on social systems, he discusses the possibilities of social system dynamics, or modeling social systems using computers with the aim of testing the possible effects of passing new public policies or laws. In his paper he recognized the difficulty of producing a reliable computer model system, but argued that an imperfect model was better than none and simply implementing new policy.[[9]](https://en.wikipedia.org/wiki/Social_system#cite_note-:3-9)

Forrester argued that unsuccessful public policies aim to treat the symptoms rather than the causes of social issues and that they also generally focus on efforts rather than on results. This occurs because there is either an incomplete understanding or a misunderstanding of the causes of an issue on the part of the policymakers, which often leads to ineffective or detrimental policies which aggravate the issues they were implemented to correct or cause other issues to arise. Another problem Forrester notes is that some policies which may work in the long run may aggravate an issue in the short run. A successful policy according to Forrester must target the correct leverage points, in this case the aspect of the social problem which, if modified, will produce a sizeable enough effect to correct the problem.

Modeling

One significant problem with studying social systems is the difficulty of forming and testing theories; social systems are not easily manipulated or controlled and large-scale systems cannot be reproduced in a lab setting.[[10]](https://en.wikipedia.org/wiki/Social_system#cite_note-10) However, the rapid increase in the availability of digital [data](https://en.wikipedia.org/wiki/Data) over the last decade gives scientists studying the behaviors of social systems very detailed and much more holistic pictures of how social systems respond to various events and how networked social systems behave.[[11]](https://en.wikipedia.org/wiki/Social_system#cite_note-11) Additionally, the development and popularity of social media platforms such as [Facebook](https://en.wikipedia.org/wiki/Facebook) and [Twitter](https://en.wikipedia.org/wiki/Twitter) offer new ways to study the evolution of social systems and social networking behaviors with [social graphs](https://en.wikipedia.org/wiki/Social_graph).[[12]](https://en.wikipedia.org/wiki/Social_system#cite_note-12) Even though the behaviors of these systems may be surprising or not yet well understood, the digital age offers a new frontier for the study of social systems.[[13]](https://en.wikipedia.org/wiki/Social_system#cite_note-13)

Notable past models are the WORLD2 and [WORLD3](https://en.wikipedia.org/wiki/World3) models: these both aimed to outline the world's distribution of resources. WORLD3 was based on the [Club of Rome](https://en.wikipedia.org/wiki/Club_of_Rome)'s [Limits to Growth](https://en.wikipedia.org/wiki/The_Limits_to_Growth).

South Asia includes the following 8 countries: India is the second-most populous country in the world with **1.3B** people, coming in second only to China. Despite falling birthrates in the country, India is expected to overtake China in population by 2028.

| **#** | **Country (or dependency)** | **Population(2020)** | **YearlyChange** | **NetChange** | **Density(P/Km²)** | **Land Area(Km²)** | **Migrants(net)** | **Fert.Rate** | **Med.Age** | **UrbanPop %** | **WorldShare** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | [**China**](https://www.worldometers.info/world-population/china-population/) | **1,439,323,776** | 0.39 % | 5,540,090 | 153 | 9,388,211 | -348,399 | 1.7 | 38 | 61 % | 18.47 % |
| 2 | [**India**](https://www.worldometers.info/world-population/india-population/) | **1,380,004,385** | 0.99 % | 13,586,631 | 464 | 2,973,190 | -532,687 | 2.2 | 28 | 35 % | 17.70 % |
| 3 | [**Indonesia**](https://www.worldometers.info/world-population/indonesia-population/) | **273,523,615** | 1.07 % | 2,898,047 | 151 | 1,811,570 | -98,955 | 2.3 | 30 | 56 % | 3.51 % |
| 4 | [**Pakistan**](https://www.worldometers.info/world-population/pakistan-population/) | **220,892,340** | 2.00 % | 4,327,022 | 287 | 770,880 | -233,379 | 3.6 | 23 | 35 % | 2.83 % |
| 5 | [**Bangladesh**](https://www.worldometers.info/world-population/bangladesh-population/) | **164,689,383** | 1.01 % | 1,643,222 | 1,265 | 130,170 | -369,501 | 2.1 | 28 | 39 % | 2.11 % |
| 6 | [**Japan**](https://www.worldometers.info/world-population/japan-population/) | **126,476,461** | -0.30 % | -383,840 | 347 | 364,555 | 71,560 | 1.4 | 48 | 92 % | 1.62 % |
| 7 | [**Philippines**](https://www.worldometers.info/world-population/philippines-population/) | **109,581,078** | 1.35 % | 1,464,463 | 368 | 298,170 | -67,152 | 2.6 | 26 | 47 % | 1.41 % |
| 8 | [**Vietnam**](https://www.worldometers.info/world-population/vietnam-population/) | **97,338,579** | 0.91 % | 876,473 | 314 | 310,070 | -80,000 | 2.1 | 32 | 38 % | 1.25 % |
| 9 | [**Turkey**](https://www.worldometers.info/world-population/turkey-population/) | **84,339,067** | 1.09 % | 909,452 | 110 | 769,630 | 283,922 | 2.1 | 32 | 76 % | 1.08 % |
| 10 | [**Iran**](https://www.worldometers.info/world-population/iran-population/) | **83,992,949** | 1.30 % | 1,079,043 | 52 | 1,628,550 | -55,000 | 2.2 | 32 | 76 % | 1.08 % |
| 11 | [**Thailand**](https://www.worldometers.info/world-population/thailand-population/) | **69,799,978** | 0.25 % | 174,396 | 137 | 510,890 | 19,444 | 1.5 | 40 | 51 % | 0.90 % |
| 12 | [**Myanmar**](https://www.worldometers.info/world-population/myanmar-population/) | **54,409,800** | 0.67 % | 364,380 | 83 | 653,290 | -163,313 | 2.2 | 29 | 31 % | 0.70 % |
| 13 | [**South Korea**](https://www.worldometers.info/world-population/south-korea-population/) | **51,269,185** | 0.09 % | 43,877 | 527 | 97,230 | 11,731 | 1.1 | 44 | 82 % | 0.66 % |
| 14 | [**Iraq**](https://www.worldometers.info/world-population/iraq-population/) | **40,222,493** | 2.32 % | 912,710 | 93 | 434,320 | 7,834 | 3.7 | 21 | 73 % | 0.52 % |
| 15 | [**Afghanistan**](https://www.worldometers.info/world-population/afghanistan-population/) | **38,928,346** | 2.33 % | 886,592 | 60 | 652,860 | -62,920 | 4.6 | 18 | 25 % | 0.50 % |
| 16 | [**Saudi Arabia**](https://www.worldometers.info/world-population/saudi-arabia-population/) | **34,813,871** | 1.59 % | 545,343 | 16 | 2,149,690 | 134,979 | 2.3 | 32 | 84 % | 0.45 % |
| 17 | [**Uzbekistan**](https://www.worldometers.info/world-population/uzbekistan-population/) | **33,469,203** | 1.48 % | 487,487 | 79 | 425,400 | -8,863 | 2.4 | 28 | 50 % | 0.43 % |
| 18 | [**Malaysia**](https://www.worldometers.info/world-population/malaysia-population/) | **32,365,999** | 1.30 % | 416,222 | 99 | 328,550 | 50,000 | 2.0 | 30 | 78 % | 0.42 % |
| 19 | [**Yemen**](https://www.worldometers.info/world-population/yemen-population/) | **29,825,964** | 2.28 % | 664,042 | 56 | 527,970 | -30,000 | 3.8 | 20 | 38 % | 0.38 % |
| 20 | [**Nepal**](https://www.worldometers.info/world-population/nepal-population/) | **29,136,808** | 1.85 % | 528,098 | 203 | 143,350 | 41,710 | 1.9 | 25 | 21 % | 0.37 % |
| 21 | [**North Korea**](https://www.worldometers.info/world-population/north-korea-population/) | **25,778,816** | 0.44 % | 112,655 | 214 | 120,410 | -5,403 | 1.9 | 35 | 63 % | 0.33 % |
| 22 | [**Taiwan**](https://www.worldometers.info/world-population/taiwan-population/) | **23,816,775** | 0.18 % | 42,899 | 673 | 35,410 | 30,001 | 1.2 | 42 | 79 % | 0.31 % |
| 23 | [**Sri Lanka**](https://www.worldometers.info/world-population/sri-lanka-population/) | **21,413,249** | 0.42 % | 89,516 | 341 | 62,710 | -97,986 | 2.2 | 34 | 18 % | 0.27 % |
| 24 | [**Kazakhstan**](https://www.worldometers.info/world-population/kazakhstan-population/) | **18,776,707** | 1.21 % | 225,280 | 7 | 2,699,700 | -18,000 | 2.8 | 31 | 58 % | 0.24 % |
| 25 | [**Syria**](https://www.worldometers.info/world-population/syria-population/) | **17,500,658** | 2.52 % | 430,523 | 95 | 183,630 | -427,391 | 2.8 | 26 | 60 % | 0.22 % |
| 26 | [**Cambodia**](https://www.worldometers.info/world-population/cambodia-population/) | **16,718,965** | 1.41 % | 232,423 | 95 | 176,520 | -30,000 | 2.5 | 26 | 24 % | 0.21 % |
| 27 | [**Jordan**](https://www.worldometers.info/world-population/jordan-population/) | **10,203,134** | 1.00 % | 101,440 | 115 | 88,780 | 10,220 | 2.8 | 24 | 91 % | 0.13 % |
| 28 | [**Azerbaijan**](https://www.worldometers.info/world-population/azerbaijan-population/) | **10,139,177** | 0.91 % | 91,459 | 123 | 82,658 | 1,200 | 2.1 | 32 | 56 % | 0.13 % |
| 29 | [**United Arab Emirates**](https://www.worldometers.info/world-population/united-arab-emirates-population/) | **9,890,402** | 1.23 % | 119,873 | 118 | 83,600 | 40,000 | 1.4 | 33 | 86 % | 0.13 % |
| 30 | [**Tajikistan**](https://www.worldometers.info/world-population/tajikistan-population/) | **9,537,645** | 2.32 % | 216,627 | 68 | 139,960 | -20,000 | 3.6 | 22 | 27 % | 0.12 % |
| 31 | [**Israel**](https://www.worldometers.info/world-population/israel-population/) | **8,655,535** | 1.60 % | 136,158 | 400 | 21,640 | 10,000 | 3.0 | 30 | 93 % | 0.11 % |
| 32 | [**Hong Kong**](https://www.worldometers.info/world-population/china-hong-kong-sar-population/) | **7,496,981** | 0.82 % | 60,827 | 7,140 | 1,050 | 29,308 | 1.3 | 45 | N.A. | 0.10 % |
| 33 | [**Laos**](https://www.worldometers.info/world-population/laos-population/) | **7,275,560** | 1.48 % | 106,105 | 32 | 230,800 | -14,704 | 2.7 | 24 | 36 % | 0.09 % |
| 34 | [**Lebanon**](https://www.worldometers.info/world-population/lebanon-population/) | **6,825,445** | -0.44 % | -30,268 | 667 | 10,230 | -30,012 | 2.1 | 30 | 78 % | 0.09 % |
| 35 | [**Kyrgyzstan**](https://www.worldometers.info/world-population/kyrgyzstan-population/) | **6,524,195** | 1.69 % | 108,345 | 34 | 191,800 | -4,000 | 3.0 | 26 | 36 % | 0.08 % |
| 36 | [**Turkmenistan**](https://www.worldometers.info/world-population/turkmenistan-population/) | **6,031,200** | 1.50 % | 89,111 | 13 | 469,930 | -5,000 | 2.8 | 27 | 53 % | 0.08 % |
| 37 | [**Singapore**](https://www.worldometers.info/world-population/singapore-population/) | **5,850,342** | 0.79 % | 46,005 | 8,358 | 700 | 27,028 | 1.2 | 42 | N.A. | 0.08 % |
| 38 | [**State of Palestine**](https://www.worldometers.info/world-population/state-of-palestine-population/) | **5,101,414** | 2.41 % | 119,994 | 847 | 6,020 | -10,563 | 3.7 | 21 | 80 % | 0.07 % |
| 39 | [**Oman**](https://www.worldometers.info/world-population/oman-population/) | **5,106,626** | 2.65 % | 131,640 | 16 | 309,500 | 87,400 | 2.9 | 31 | 87 % | 0.07 % |
| 40 | [**Kuwait**](https://www.worldometers.info/world-population/kuwait-population/) | **4,270,571** | 1.51 % | 63,488 | 240 | 17,820 | 39,520 | 2.1 | 37 | N.A. | 0.05 % |

**Q.2 What is an ecosystem? Analyze the impact of population phenomenon on the ecosystem in Pakistan with special reference to energy and chemical cycling.**

**ANS**

An **ecosystem** (or **ecological system**) consists of all the organisms and the physical environment with which they interact.[[2]](https://en.wikipedia.org/wiki/Ecosystem#cite_note-Chapinglossary-2): 458 These biotic and [abiotic components](https://en.wikipedia.org/wiki/Abiotic_component) are linked together through nutrient cycles and energy flows. Energy enters the system through [photosynthesis](https://en.wikipedia.org/wiki/Photosynthesis) and is incorporated into plant tissue. By feeding on plants and on one another, animals play an important role in the movement of [matter](https://en.wikipedia.org/wiki/Matter) and [energy](https://en.wikipedia.org/wiki/Energy) through the system. They also influence the quantity of plant and [microbial](https://en.wikipedia.org/wiki/Microbe) [biomass](https://en.wikipedia.org/wiki/Biomass_%28ecology%29) present. By breaking down dead [organic matter](https://en.wikipedia.org/wiki/Organic_matter), [decomposers](https://en.wikipedia.org/wiki/Decomposer) release [carbon](https://en.wikipedia.org/wiki/Carbon) back to the atmosphere and facilitate [nutrient cycling](https://en.wikipedia.org/wiki/Nutrient_cycling) by converting nutrients stored in dead biomass back to a form that can be readily used by plants and microbes.

Ecosystems are controlled by external and internal [factors](https://en.wikipedia.org/wiki/Environmental_factor). External factors such as [climate](https://en.wikipedia.org/wiki/Climate), [parent material](https://en.wikipedia.org/wiki/Parent_material) which forms the soil and [topography](https://en.wikipedia.org/wiki/Topography), control the overall structure of an ecosystem but are not themselves influenced by the ecosystem. Internal factors are controlled, for example, by [decomposition](https://en.wikipedia.org/wiki/Decomposition), root competition, shading, disturbance, succession, and the types of species present. While the [resource](https://en.wikipedia.org/wiki/Resource_%28biology%29) inputs are generally controlled by external processes, the availability of these resources within the ecosystem is controlled by internal factors. Therefore, internal factors not only control ecosystem processes but are also controlled by them.

Ecosystems are [dynamic](https://en.wiktionary.org/wiki/dynamic) entities—they are subject to periodic disturbances and are always in the process of recovering from some past disturbance. The tendency of an ecosystem to remain close to its equilibrium state, despite that disturbance, is termed its [resistance](https://en.wikipedia.org/wiki/Resistance_%28ecology%29). The capacity of a system to absorb disturbance and reorganize while undergoing change so as to retain essentially the same function, structure, identity, and feedbacks is termed its [ecological resilience](https://en.wikipedia.org/wiki/Ecological_resilience). Ecosystems can be studied through a variety of approaches—theoretical studies, studies monitoring specific ecosystems over long periods of time, those that look at differences between ecosystems to elucidate how they work and direct manipulative experimentation. [Biomes](https://en.wikipedia.org/wiki/Biome) are general classes or categories of ecosystems. However, there is no clear distinction between biomes and ecosystems. [Ecosystem classifications](https://en.wikipedia.org/wiki/Ecological_classification) are specific kinds of ecological classifications that consider all four elements of the definition of [ecosystems](https://en.wikipedia.org/wiki/Ecosystems): a biotic component, an [abiotic](https://en.wikipedia.org/wiki/Abiotic) complex, the interactions between and within them, and the physical space they occupy.

Ecosystems provide a variety of goods and services upon which people depend. Ecosystem goods include the "tangible, material products" of ecosystem processes such as water, food, fuel, construction material, and [medicinal plants](https://en.wikipedia.org/wiki/Medicinal_plant). [Ecosystem services](https://en.wikipedia.org/wiki/Ecosystem_services), on the other hand, are generally "improvements in the condition or location of things of value". These include things like the maintenance of [hydrological cycles](https://en.wikipedia.org/wiki/Water_cycle), cleaning air and water, the maintenance of oxygen in the atmosphere, crop [pollination](https://en.wikipedia.org/wiki/Pollination) and even things like beauty, inspiration and opportunities for research. Many ecosystems become degraded through human impacts, such as [soil loss](https://en.wikipedia.org/wiki/Erosion), [air](https://en.wikipedia.org/wiki/Air_pollution) and [water pollution](https://en.wikipedia.org/wiki/Water_pollution), [habitat fragmentation](https://en.wikipedia.org/wiki/Habitat_fragmentation), [water diversion](https://en.wikipedia.org/wiki/Interbasin_transfer), [fire suppression](https://en.wikipedia.org/wiki/Wildfire_suppression), and [introduced species](https://en.wikipedia.org/wiki/Introduced_species) and [invasive species](https://en.wikipedia.org/wiki/Invasive_species). These threats can lead to abrupt transformation of the ecosystem or to gradual disruption of biotic processes and degradation of [abiotic](https://en.wikipedia.org/wiki/Abiotic_component) conditions of the ecosystem. Once the original ecosystem has lost its defining features, it is considered ["collapsed](https://en.wikipedia.org/wiki/Ecosystem_collapse)". [Ecosystem restoration](https://en.wikipedia.org/wiki/Restoration_ecology) is thought to contribute to all 17 [Sustainable Development Goals](https://en.wikipedia.org/wiki/Sustainable_Development_Goals).

Pakistan comes in the list of countries where there is stunted growth in children. 38% of Pakistani children under the age of five are stunted due to chronic malnutrition. According to demographic and health survey 2018. We also lag in infant mortality and maternal health. We have health problems, chronic illnesses, tobacco usage among millions of men and women in our country. Mental health is also of the serious but neglected problems of our country. We have seen a rising suicide rate, especially among youth. There has been a rise in substance abuse among both adults and children. We have a problem with clean drinking water and sanitation. Road safety and accidents are also of the main causes of death and destruction in Pakistan. We face the problem of not having enough economic, safer and faster modes of transportation inter and intracity. We have problems like child Labor and non-documentation of a huge number of women and children working as domestic Help. Children don’t have enough playgrounds. We don’t have workplace safety in practice for blue-collar workers who due to accidents while working in the hazardous industry can get injured with effects lasting a lifetime. We don’t have a representation of differently-abled people in the parliament and senate hence the bills passed for differently-abled people are not from someone belonging to their community and might not even have an understanding of the problems and challenges they face and aspirations they have. If we try and pick one menace in our community, which if sorted would bring betterment in our country and society, that would be the eradication of poverty. Through Zakat, Charity and job creation we can try and eradicate a lot of problems in our country. Here is where the concepts of “Social Entrepreneurship” come in which aims at not only giving fish to feed the hungry but also train and educate them so they can catch the fish by themselves while keeping their honor. And it’s forecasted to be one of the fastestgrowing for the coming years the percentage of people living below the poverty line has halved in the last 10 years In Pakistan. 3G-4G users have grown four times in the last 10 years in Pakistan. 65% of the population lives in the ruler areas E-commerce is showing record growth in the ecosystem of startups in Pakistan. Since 2010, 720 startups have been established 67% are still active. Until now the government has been supporting the startup space in Pakistan. In 2017 licenses of Pakistan first PE and venture capital funds were issued. The government-led incubators Plan 9 under Punjab IT Board. Three-year tax waiver in 2017 by FBR for tax-related startups are some of the initiatives taken by the government. LUMS, NUST, IBA, FAST Lead the way in introducing students to entrepreneurship courses and incubators. The government has funded incubation centers in all four provinces Pakistan is at 122 out of 137 countries in the ranking of the global entrepreneurship development Institute. India is 69. Nigeria is 100 Bangladesh is 133. There are more than six steps in starting a business in Pakistan. Concerned departments are SECP, federal tax body, Provincial Tax body. The process is cumbersome solution is to have a one-stop-shop which has increased in business registration in other economies. The government needs to improve and enable the digital payment method. A guideline from the government should be given on how to make investments in ventures in Pakistan

**Q.3 Critically review the role of different catalytic agents. Do you think they can bring desired behavioral change in the society?**

**ANS**

These **catalytic** **agents** may be classified into four types, namely, the precious metals loaded on the oxidizing materials [ 14, 15 ], the oxides of transition metal [ 16, 17 ], the oxides of perovskite-type,, and carbon-based materials

a change in the rate of a chemical reaction owing to the presence of substances (catalysts) that enter into the intermediate interactions with the reactants yet regain their original chemical composition after each intermediate interaction cycle. Reactions involving catalysts are known as catalytic reactions. The quantity of reactant that can undergo the transformation in the presence of the specified quantity of catalyst is not limited by any stoichiometric relations and may be quite large. Catalytic reactions differ from induced, or conjugate, reactions, in which one reaction is caused or accelerated (induced) by another and an irreversible transformation of the inductor-substance occurs. Possible changes that take place in the catalyst during catalytic reactions are due to side processes that do not determine the course of catalytic action in any way.

The action of the catalyst opens up a new reaction path, usually involving a larger number of steps, in which the catalyst enters the active complex (activated complex) during at least one stage. If during this process the reaction rate becomes greater than the rate in the absence of the catalyst, the catalysis is positive (frequently identified with the concept of catalysis in general). The reverse is also possible, when negative catalysis occurs: one of the possible reaction paths is excluded in the presence of the catalyst and only the slower ones remain, thereby retarding or even almost completely suppressing the reaction. A special case of catalysis involves the acceleration of a reaction under the effect of the reaction product or of an intermediate substance formed during the reaction (autocatalysis).

Catalysis is not connected with the change in free energy of the catalyst, and therefore the catalytic action cannot shift the equilibrium position of the chemical reaction. Catalysts accelerate both the forward and the reverse reactions when approaching the state of equilibrium.

The activation energy (E) that is, the difference between the energy of the active complex and that of the original reacting molecules, is a basic factor in determining the rate of chemical transformation. If it is assumed that the reaction does not disturb the equilibrium distribution of energy between the molecules, then the possible formation of the active complex and, consequently, the reaction rate in the first approximation, is proportional to exp (-E/RT), where R is the gas constant and Tis the absolute temperature. From here it follows that the reaction rate increases as E decreases and, owing to the exponential dependence, grows considerably even during a small reduction of E.

Figure 1 shows the change in energy during a reaction without a catalyst (curve 1) and in the presence of a catalyst (curves 2 and 3). Curve 2 with two maxima corresponds to the formation of one intermediate product.



**Figure 1.** Change in energy of reaction system during reaction process. (A) initial state, (8) intermediate compound, (C) end products, (X1), (X’2). (X”2), and (X3) active complexes.

The number of steps and intermediate products is often much larger. The interaction of the reactants with the catalyst may not even result in the formation of a stable intermediate product (curve 3). Even in this case, however, the catalyst is included in the active complex, and the interaction of the reactants with the catalyst determines the course of the reaction. If the energy of the active complexes in all stages of the reaction process with a catalyst is lower than the energy of the active complex without a catalyst (that is, E2, E”2, and are lower than E1 then participation of the catalyst leads to an increase in reaction rate (positive catalysis). In many cases of catalysis, acceleration of the reaction is achieved as a result of the appearance of energy-rich particles during the course of this very reaction; the concentration of these particles may exceed that at equilibrium. For example, the catalytic effect of water on the oxidation of carbon monoxide is related to the development of the reaction paths involving hydroxyl radicals and hydrogen atoms. Negative catalysis is frequently connected with disruptions of the chain reaction owing to chain breaking as a result of the interaction of the negative catalyst with the active particles. The retarding effect of oxygen on the union of hydrogen and chlorine may serve as an example.

The nature of the intermediate chemical interaction that occurs during catalysis is extremely diverse. Two groups of catalytic processes are generally distinguished: acid-base (heterolytic) and oxidation-reduction (homolytic). An intermediate acid-base interaction between the reactants and the catalysts (for example, proton transfer from the catalyst to the reactants and vice versa) occurs in processes of the first group. In the final stage the proton is shifted in the reverse direction and the catalyst regains its original composition. In catalysis by aprotic acids the interaction is carried out by way of the free electron pair of the reactant. Examples of acid-base catalysis include (1) hydrolysis of esters, which is accelerated by acids; (2) hydration of olefins in the presence of phosphorus-acidic catalysts; (3) isomerization and cracking of hydrocarbons using aluminosilicate catalysts; (4) alkylation; and (5) polymerization. During the course of oxidation-reduction catalysis reactions, the intermediate interaction is associated with the electron transfers between the catalyst and the reactants. This group includes (1) oxidation of sulfur dioxide into trioxide during the preparation of sulfuric acid; (2) oxidation of ammonia into nitric oxide during the preparation of nitric acid; (3) numerous processes involving the partial oxidation of organic compounds, for example, ethylene into ethylene oxide and naphthalene into phthalic anhydride; (4) hydrogenation; (5) dehydrogenation; (6) cyclization and aromatization of hydrocarbons; and (7) decomposition of hydrogen peroxide. Primarily metals of periods IV, V, and VI of the D. I. Mendeleev system, which have an incomplete d electron shell, exhibit oxidationreduction catalytic activity, as do the compounds of these metals and, to a lesser degree, the compounds of elements with an/shell that is being filled (lanthanides and actinides).

The groups discussed above by no means include all the various catalytic reactions known to occur. The nature of the intermediate interaction during catalysis is much more complex and is dependent on all the details of the electron structure of both the reactants and the catalyst. The specific mechanisms of catalytic reactions are diverse and have been firmly established in only a few cases.

Catalysis is classified as homogeneous or heterogeneous according to the phase condition of the reactants and the catalyst. Microheterogeneous catalysis, occurring in colloidal systems (for example, enzyme catalysis), occupies the intermediate position. During homogeneous catalysis, the catalyst and reactants form one homogeneous system, with no phase boundaries existing between the catalyst and the reactants. In heterogeneous catalysis, however, the catalyst and reactants are found in different phases and are divided by a phase boundary. The most important case is the one where the catalyst is a solid and the reaction system forms a liquid or gaseous phase. The intermediate interaction occurs primarily on the surface of the solid catalyst during this process.

Selection of the composition of the catalyst in a specified reaction is a very complex problem and is still primarily resolved empirically. A number of theoretical approaches based on the correlation of individual specific properties of catalysts with their activity have been proposed and developed in the USSR. For example, the multiplet theory of catalysis (first published in 1929) assumes the intermediate interaction of reactants with several atoms on the surface of solid catalysts and gives a controlling importance to the matching of the distances between the atoms in reactant molecules and the parameters for the crystalline structure of the catalyst. Later, this theory was extended by the concept of the necessity of a definite correspondence between the bond energies that split and form in the course of the reaction and the energies of reactant-catalyst bonds, which occur during intermediate interaction. A very widespread concept in the 1950’s pertained to the dependence of catalytic activity of solid catalysts having semiconductor properties on their electrical characteristics, that is, the electron theory of catalysis. According to this theory, it is assumed that the intermediate interaction of the reactants with the catalyst is realized during the participation of conductivity electrons from the solid catalyst and therefore depends on its total electron properties—for example, the destruction of energy zones and local electron levels, the release of electrons, and current carrier concentration. In the case of heterogeneous catalysis, it was generally assumed (first in 1939) that active centers, in the form of edges, angles, or different structural deformations (dislocations) in a standard crystalline structure exist on the surface of solid catalysts. It was also proposed that individually arranged atoms or aggregates of several atoms (ensembles) exhibit specific catalytic properties during application of the catalytically active substance on the inert carrier.

The development of accurate methods of determining the catalyst surface has made it possible to establish that the activity related to the unit surface (specific catalytic activity) is determined by the chemical composition and depends very little on the structural dislocations. The specific catalytic activity of various crystal faces is differentiated several times in certain cases. Deviations in chemical composition (stoichiometric deviation, introduction of impurities, local chemical formations) have a substantial effect on activity.

During the 1960’s the intermediate chemical interaction in heterogeneous catalysis was primarily thought of as local, and as determined by the electron structure of individual atoms or ions of a catalytically active constituent on the catalyst surface, taking into account the effect of the immediate environment. The development of this approach was aided by the discovery (by way of experiment) of a similar effect produced by solid catalysts containing a particular metal during heterogeneous catalysis and by soluble complexes containing the same metal during homogeneous catalysis in solutions. Furthermore, the theories of crystalline and ligand fields, which were applied even earlier in the chemistry of complex compounds, were successfully used. Correlations between the catalytic activity and bond energies of reactants in the presence of a catalyst during intermediate interaction have been established for many classes of catalysts and catalytic reactions, thereby simplifying the selection of catalysts for individual cases.

The first scientific reference to catalysis appeared early in the 19th century. In 1806 the French chemists N. Clement-Desormes and C. Desormes discovered the catalytic action of nitric oxides on the oxidation of sulfurous gas in a chamber process for the preparation of sulfuric acid. In 1811 the Russian chemist K. S. Kirkhgof noticed that dilute acids can induce the conversion of starch into sugar (glucose); in 1814 he established that this reaction can be catalyzed by diastase from barley malt. This was the beginning of research on biological catalysts, that is, enzymes. In 1818 the French chemist L. Thenard determined that many solids exhibit an accelerating effect on the decomposition of hydrogen peroxide solutions, and the British chemist H. Davy discovered the oxidability (on platinum) of alcohol and ether vapors. The German chemist J. Dobereiner established (1822) that hydrogen and oxygen combine on platinum at ordinary temperatures. It was subsequently discovered that a number of other substances also exhibit a markedly high effect on the rate or occurrence of chemical reactions. This led to the isolation of a group of phenomena named by the German chemist E. Mi-cherlich as contact (1833) and by the Swedish chemist J. Ber-zelius as catalytic (1835).

In later years a considerable number of catalytic reactions were discovered; over the last 50 years catalysis has become the leading method of conducting chemical reactions in industry. The use of catalysts enables chemical transformations to be realized at high rates and low temperatures. Most of the industrial catalytic processes would not be realized without catalysts. Selection of catalysts makes it possible to direct the chemical transformation toward the formation of a specified product from a number of possible ones. The application of stereospecific catalysts makes it possible to control the structure of the end products, such as polymers. In the early 20th century the problem of fixation of nitrogen in the air was resolved with the aid of catalysis. Promoted iron and other catalysts have made it possible to surmount the chemical inertness of elemental nitrogen and to effect the synthesis of ammonia. At the same time, a catalytic method was developed for preparing nitric acid by the oxidation of ammonia on platinum wires. Modern techniques used in the production of hydrogen from natural gas are based on catalytic reactions. Catalytic methods also occupy an important position in petroleum refining technology. Hundreds of millions of tons of high-grade motor fuel are produced by way of such catalytic reactions as cracking, hydrocracking, reforming, cyclization, and isomerization of petroleum hydrocarbons. Catalytic methods play a particularly large role in the realization of processes of organic synthesis. The USSR was the first country in the world to develop and effect the production of synthetic rubber based on the conversion of ethyl alcohol into divinyl in the presence of the multicomponent Lebedev oxide catalyst. Catalytic methods are used in the preparation of most of the products of petrochemical synthesis: solvents, aromatic hydrocarbons, monomers for the manufacture of synthetic rubber, synthetic fibers, and other polymer materials. Catalysts are also widely used in polymerization.

**Q.4 Discuss and analyzes the population polices of South Asia Countries in detail.**

**ANS**

In 1986 the population of Asia was estimated at 2.9 billion constituting 58% of the world's population on 20% of the world's territory. By the year 2000 the total population will reach 3-3.5 billion people. Fertility in China, the Koreas, and Singapore diminished by 40% between 1960-1965 and 1980-1985, and by 26-34% in Indonesia, India, Malaysia, the Philippines, and Thailand. In Malaysia, a pronatalist policy started in 1983 aims at attaining a population of 70 million by 2100. Social, educational, and health programs have markedly reduced mortality in Sri Lanka and South Korea between 1960-1965 and 1980-1985 and life expectancy exceeded 60 years in 1980. The figure for Burma, Indonesia, and India was 52-55 years for the same period. Bangladesh plans to reduce the birth rate from 5.8 children/woman in 1980 to 3.2 by 1990, while Thailand started a program in 1986 to increase it by 1.5%. Population distribution policies to alleviate urban congestion have been implemented in South Korea, Indonesia, Malaysia, and the Philippines. Immigration to Canada and the United States from Pakistan and South Korea have relieved internal population pressures. Almost half a million Koreans have migrated to 72 different countries between 1962- 1981. Successful population policies require the analysis of economic, educational, social, and cultural factors of demographics.

####  India

Geopolitically speaking India is an extremely important country as it faces the Indian Ocean connecting Asia and Africa and is positioned in the center of sea lanes. Moreover, India has the 3rd largest economy in Asia, with the world's 2nd largest population and a huge middle-income group. Japan and India are the two largest democratic countries in Asia, sharing common universal values, such as democracy and the rule of law, as well as strategic interests.

The Indian economy has been maintaining a high economic growth rate of around 7% since Prime Minister Modi took office in May 2014. In addition to the booming stock market, consumption and production have been increasing, and the foreign direct investment emphasized by Prime Minister Modi has also been rising steadily against a backdrop of deregulation.

In diplomatic relations, Prime Minister Modi has put forward the “Act East” policy and is developing active diplomacy that promotes specific cooperation in the Asia-Pacific region, thereby enabling India to gain more influence in the international arena as a global power.

Regarding relations with Japan, in 2016 three summit meetings were held. The highlight was the meeting on the occasion of Prime Minister Modi's visit to Japan in November. In addition to the signing of the Agreement between the Government of Japan and the Government of the Republic of India for Cooperation in the Peaceful Uses of Nuclear Energy, steady progress was made in the high-speed rail project, and great achievements were made in various areas including industrial human resource development, thus substantially advancing the “new era in Japan-India relations”. Furthermore, Prime Minister Abe and Prime Minister Modi shared the view that they would drive peace and prosperity in the Indo-Pacific region and the world by linking the “Free and Open India and Pacific Strategy” and “Act East” policy. During his stay in Japan, Prime Minister Modi made a trip by Shinkansen together with Prime Minister Abe and visited a Shinkansen plant in Kobe.

#### Pakistan

Pakistan is located in a strategic location connecting Asia and the Middle East. Thus, its political stability and economic development are essential for the stability and growth of the region. Pakistan is also the most important country in the context of international counterterrorism measures. Furthermore, the country embraces a population of around 190 million, and approximately 60% of the total population is under 25 years old, thus making its economic potential high.

In security, Prime Minister Sharif has identified security improvement as a top priority. Since June 2014 the Pakistani military has conducted operations against armed forces including the Tehrik-i-Taliban Pakistan (TTP), and the number of terrorist incidents was reduced by approximately half in 2015 and by approximately 30% in 2016 compared to the previous year.

In foreign affairs, Prime Minister Sharif has been aiming to improve the relations with neighboring countries including India. In December 2015, the reopening of a full-fledged dialogue was expected when Prime Minister Modi of India paid a surprise visit to Pakistan. However, after the terrorist attack on an Indian Air Force station in January 2016, India-Pakistan relations have been tense. Furthermore, under the “all-weather strategic cooperative partnership,” relations with China have been enhanced in a wide range of fields toward the construction of an economic corridor between China and Pakistan, which is an important constituent element of China's initiative, “One belt, One road.” Regarding the relationship with Afghanistan, the Quadrilateral Coordination Group (QCG: with the participation of Pakistan, Afghanistan, the U.S., and China) has been holding discussions on peace and reconciliation process since January 2016, but the group's consultations have been stalled. Furthermore, there remain many issues between the two countries, including border control, refugee issues, etc.

#### Bangladesh

Bangladesh, in which Muslims account for around 90% of the population, is a democratic country located in the Bay of Bengal and is geopolitically very important as an intersection between India and ASEAN.

The Awami League administration led by Prime Minister Hasina has been stable. However, following the terrorist incident in October 2015 in which a Japanese national was murdered, attacks on secular bloggers and terrorist incidents targeting Shiite Muslim and Hindu religious facilities and security authorities have continued occurring in 2016. While the Government of Bangladesh had tightened security for foreign nationals through crackdowns on domestic Islamic extremists, a terrorist attack occurred in Dhaka on July 1 (local time), killing more than 20 people including seven Japanese nationals, and an organization calling itself ISIL Bangladesh claimed responsibility for the attack. Subsequently, measures to combat terrorism have been advanced by the security authorities, including exposing Islamic extremist groups and setting up numerous checkpoints but the threat of terrorism still remains throughout the country.

####  Sri Lanka

Sri Lanka is situated at a strategic point on the sea lanes in the Indian Ocean. The country is traditionally pro-Japanese and its geopolitical and economic importance is attracting attention. After the end of the civil war in 200923, the security situation has greatly improved. Japanese tourists roughly quadrupled as compared with 2008 to about 40,000 (as of 2015).

In domestic affairs, President Sirisena, who took office as a result of the presidential election in January 2015, maintained the grand coalition of the United National Party (UNP) and the Sri Lanka Freedom Party (SLFP) after the general election in August the same year, and is running the government together with Prime Minister Wickremesinghe (UNP).

#### Nepal

Nepal has geopolitical importance as an inland state between the great powers of China and India. For many years, Japan has been a major donor to Nepal and the two countries keep traditionally friendly relations through a variety of exchanges including relations between the imperial family and the former royal family, and mountaineering.

In 2016, Japan and Nepal commemorated the 60th anniversary of the establishment of Japan-Nepal diplomatic relations. Japan and Nepal have maintained friendly relations over a long period of time and they have deepened their bonds as Asian countries that have both experienced a major earthquake, namely the Great East Japan Earthquake (March 2011) and the major Nepal earthquake (April 2015). Throughout 2016, exchange programs in a variety of areas, including arts, culture, sports, tourism, etc., were carried out between the two countries. In September, State Minister for Foreign Affairs Kishi attended the ceremony for the 60th anniversary of the establishment of diplomatic relations between Japan and Nepal as the representative of Japan. The ceremony was held with great success with the presence of related ministers from the Nepali side led by Prime Minister Dahal (Prachanda), government officials from the two countries, diplomatic missions in Nepal, staff of international organizations, etc. Japan and Nepal stated that they would further strengthen the friendly and cooperative relations between the two countries.

#### Bhutan

Bhutan peacefully shifted from a monarchy to a constitutional monarchy in 2008. Currently, efforts are being made to establish a democracy under the Tobgay administration. The government sets Gross National Happiness (GNH) as a guideline of the administration and is particularly working on economic independence, food production, and the reduction of youth unemployment rate under the 11th Five-Year Plan (until 2018).

With regard to the relationship with Japan, since His Majesty and Her Majesty of Bhutan visited Japan as state guests in 2011, exchanges between Japan and Bhutan have become active in a variety of fields and at various levels. In January 2016, Economic Minister Wangchuk visited Japan and had a meeting with State Minister for Foreign Affairs Kihara to exchange views to further encourage economic relations between the two countries, including increasing the number of Japanese tourists to Bhutan and investment from Japanese companies in Bhutan. Furthermore, 2016 was the 30th anniversary of the establishment of Japan-Bhutan diplomatic relations. In May in Japan, the inauguration ceremony of the Bhutan Exhibition in Ueno Royal Museum was held with the presence of Her Majesty the Queen Mother Tshering Yangdon Wangchuck and Her Royal Highness Princess Dechen Yangzom Wangchuck. Furthermore, Special Advisor to the Prime Minister Katsuyuki Kawai attended the inauguration of “Japan Week in Bhutan” held in Bhutan in September.

**Q.5 What are the different steps involved in the process of research and the applied methodologies required in the population education?**

**ANS**

There are a variety of approaches to research in any field of investigation, irrespective of whether it is applied research or basic research. Each particular research study will be unique in some ways because of the particular time, setting, environment, and place in which it is being undertaken.

Nevertheless, all research endeavors share a common goal of furthering our understanding of the problem and thus all traverse through certain basic stages, forming a process called the **research process.**

An understanding of the research process is necessary to effectively carry out research and sequencing of the stages inherent in the process.

These 8 stages in the research process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.



The research process outlined above is, in essence, part and parcel of a research proposal. It is an outline of your commitment that you intend to follow in executing a research study.

A close examination of the above stages reveals that each of these stages, by and large, is dependent upon the others.

One cannot analyze data (step 7) unless he has collected data (step 6). It is also true that one cannot write a report (step 8) unless he has collected and analyzed data (step 7).

Research then is a system of interdependent related stages. Violation of this sequence can cause irreparable harm to the study.

It is also true that several alternatives are available to the researcher during each of the stages stated above. A research process can be compared with a route map.

The map analogy is useful for the researcher because at each stage of the research process, and there are several alternatives to follow.

Choosing the best alternative in terms of time constraints, money, and human resources in our research decision is our primary goal.

Before explaining the stages of the research process, we explain the term ‘iterative’ appearing within the oval-shaped diagram at the center of the schematic diagram. The key to a successful research project ultimately lies in iteration: the process of returning again and again to the identification of the research problems, methodology, data collection, etc. which lead to new ideas, revisions and improvements.

Often, by discussing the research project with advisers and peers, one will find that new research questions need to be added, variables to be omitted, added or redefined, and other changes to be made. As a proposed study is examined and reexamined from different perspectives, it may begin to transform and take a different shape.

This is to be expected and is an essential component of a good research study.

Besides, it is important to examine study methods and data to be collected from different viewpoints to ensure a comprehensive approach to the research question.

In conclusion, there is seldom any single strategy or formula for developing a successful research study, but it is important to realize that the research process is cyclical and iterative.

## Step – 1: Identifying the Problem

The first and foremost task in the entire process of scientific research is to identify a research problem.

A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

But the core question is: whether all problems require research.

We have countless problems around us, but all that we encounter do not qualify as research problems, and thus, these do not need to be researched.

Keeping this point in view, we must draw a line between a research problem and a non-research problem.

Intuitively, researchable problems are those who have a possibility of thorough verification investigation, which can be effected through the analysis and collection of data, while the non-research problems do not need to go through these processes.

Researcher need to identify both;

1. Non-research Problem, and
2. Research Problem.

### Non-Research Problem

A **non-research problem**is one that does not require any research to arrive at a solution. Intuitively, a non-researchable problem consists of vague details and cannot be resolved through research.

It is a managerial or built-in problem that may be solved at the administrative or management level. The answer to any question raised in a non- research setting is almost always obvious.

The outbreak of cholera, for example, following a severe flood, is a common phenomenon in many communities. The reason for this is known. It is thus not a research problem.

Similarly, reasons for the sudden rise in prices of many essential commodities following the announcement of the budget by the Finance Minister need no investigation. Hence it is not a problem that needs research.

**Example #1**

A recent survey in District A found that 1000 women were continuous users of contraceptive pills.

But last month’s service statistics indicate that none of these women were using contraceptive pills (Fisher et al. 1991:4).

The **discrepancy**is that ‘all 1000 women should have been using a pill, but in fact, none is doing so. The question is: why the discrepancy exists?

Well, the fact is, a monsoon flood has prevented all new supplies of pills reaching District A, and all old supplies have been exhausted. Thus, although the problem situation exists, the reason for the problem is already known.

Therefore, assuming that all the facts are correct, there is no reason to research the factors associated with pill discontinuation among women. This is thus a non-research problem.

**Example #2**

A pilot survey by Dhaka University revealed that in Raipura Upazila, the goiter prevalence among the school children is as high as 80%, while in the neighboring Upazila, it is only to the extent of 30%. Why is this discrepancy?

Upon inquiry, it was seen that some three years back, UNICEF launched a lipiodol injection program in the neighboring Upazila.

This attempt acted as a preventive measure against goiter. The reason for the discrepancy is known, and hence we do not consider the problem as a research problem.

**Example #3**

**A**hospital treated a large number of cholera cases with penicillin, but the treatment with penicillin was not found to be effective. Do we need research to know the reason?

Here again, there is one single reason that Vibrio cholera is not sensitive to penicillin, and therefore, this is not the drug of choice for this disease.

In this case, too, as the reasons are known, it is unwise to undertake any study to find out why penicillin does not improve the condition of cholera patients. This is also a non-research problem.

### Research Problem

In contrast to a non-research problem, a **research problem**is of primary concern to a researcher.

A research problem is a perceived difficulty, a feeling of discomfort, or a discrepancy between the common belief and reality.

As noted by Fisher et al. (1993), a problem will qualify as a potential research problem when the following three conditions exist:

1. There should be a perceived discrepancy between “what it is” and “what it should have been.” This implies that there should be a difference between “what exists” and the “ideal or planned situation”;
2. A question about “why” the discrepancy exists. This implies that the reason(s) for this discrepancy is unclear to the researcher (so that it makes sense to develop a research question); and
3. There should be at least two possible answers or solutions to the questions or problems.

The third point is important. If there is only one possible and plausible answer to the question about the discrepancy, then a research situation does not exist.

It is a non-research problem that can be tackled at the managerial or administrative level.

**Example #1**

While visiting a rural area, the UNICEF team observed that some villages have female school attendance rates as high as 75%, while some have as low as 10%, although all villages should have a nearly equal rate of attendance. What factors are associated with this discrepancy?

We may enumerate several reasons for this:

1. Villages differ in their socio-economic background.
2. In some villages, the Muslim population constitutes a large proportion of the total population. Religion might play a vital role.
3. Schools are far away from some villages. The distance thus may make this difference.