ENVIRONMENT, DEVELOPMENT AND PLANNING: A STUDY OF EASTERN HILLS AND TRIBAL SETTLEMENTS OF PANCHMAHALS

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SUMMARY

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SUMMARY

The growing concern for man–environment interrelationship has been the basis of the present research which intended to circumspect and explore the true nature of the processes of evolution and transformation of man–environment relationship in a tribal space i.e. a region dominated by the tribes. Realizing the intricacy of the environmental system the study is circumscribed around the three nuclei viz. the hills (intercepted with forests) the tribes and the tribal settlements. Besides, emphasizing on these three nuclei, their associated phenomena are also emphatically studied.

Environment of any space is a combination of physical, human and non–substantial symbiotic phenomena irrespective of dimensions. These mutually interacting phenomena are significantly contributive in the modification and transformation of the environment. The role of human perceptions, preferences, evaluations and decisions regarding environmental potentialities and realities are also worthy of mention.

An indomitable transitive or involuntary successional change in erratic phenomena i.e. forms and processes, at each collateral interface may cause transformation. During transformation the system might reach self–sufficiency, crises or dependency depending upon the demand of the population of each constituent unit. In other words, it might attain climax, stability instability or extinction at any interface depending upon the actions and activities of the population of the region. It is noteworthy that constituents do not only decide the nature of the evolving environment but also the nature of the operating processes and laws

The significance of environment lies in its cardinal role in the survival of human and other beings. So, the survival of human beings necessitates the maintenance of symbiotism and resilience of the environment. It is mentionable that sustainability prevails in mutual adjustment, dependence and perseverance and not in struggle and indiscriminate anticipation. And the reverie of sustainable development could be true by the reappraisal of the problems, proper monitoring, management and commensurate revival of the deteriorating environment. Such planning and management with an objective of attaining sustainable development must not only focus on conservation and resilience to satisfy the growing demand but also to curtail the unsatiable desires.

The basic theme of the study has been to explore and examine the processes of evolution of tribal space, their mutual interaction, interdependence and relationship with the pre–existing and evolving environment to attain multitudinal betterment and secure survival in perpetuity. In this context, various adhesive significant and

regulating phenomena, such as location, history, demographic and socio–cultural evolution and perceptions and reactions to the various stimuli present in the environment are studied. Various symptomatic and synchronizing problems evolved during the course of evolution of the tribal space and their environment are also scrutinized. Finally an effort is made to synthesize comprehensive and syllogistic solutions and generating a simulation model relating to the evolution of a coherent development process.

Conceptualization of the theme led the study to set at the outset specific objectives to analyse and interpret the realities conceived. These are:–

1. To trace out the origin, location and evolution of tribal space in the study area.
2. To reconstruct the pre–existing environment and to attempt its comparison with the existing environment.
3. To attempt an assessment of the existing and prospective potentials of the tribal environment.
4. To study the symbiotic relationship between tribes, tribal space and their environment consisting of closely associated phenomena.
5. To analyse the trend of socio–cultural and economic evolution of tribes and resultant effects upon the existing environment.
6. To analyse the efficacy and role of associated phenomena such as time, distance, area, location, altitude, physiography, etc. in the evolution of existing physical, social, cultural and economic environment.
7. To develop a feasible planning model for sustainable development of hilly environment inhabited by the tribes with due consideration to the entire related human and non–human stimulating phenomena.

Methodology adopted for the study incorporated various stages, such as perception, conception, gestation and substantiation and accompanied by the selection of approach, hypothesis formulation, identification of conceptual bases, application of statistical techniques and cartographic techniques. Perception involved – reception of the ideas or knowledge and framing the image of the environment; conception involved – adoption of approaches, formulation of hypotheses and concepts and selection of techniques; gestation involved – review of literature, application of approaches and techniques in surveillance, collection and derivations of secondary and primary data, examination of the realities and probabilities and detection of the problems; and substantiation involved – computation and analyses of data, analyses of concepts, testing of hypotheses and drawing inferences, finding solutions, evolving models or theories and conclusion. Besides, suitable qualitative and quantitative techniques have been applied wherever necessary.

Emanating from the research theme and objectives of the study, the study area was demarcated, comprising three potent nuclei viz. the hills, the tribes and the tribal settlements covering five talukas viz. Devgadh Baria, Limkheda, Dahod, Jhalod and Santrampur of Eastern Panchmahals. Presently the area is administratively demarcated as Dahod District of Gujarat, India.

Locational, physiographic, biodiversity, socio–economic and cultural attributes were some of the important factors considered for the selection of the study area. Besides, the area was found quite suitable to study the causes of inhabitation of the region in the past and thence the evolution of contemporary agrarian system in such adverse geographical conditions.

The sample villages for secondary and primary investigation were selected randomly. The sample area consists of nearly 1092 villages. For the shake of preciseness and accuracy of statistical analysis, size of the sample was kept at 10 per cent i.e. 110 villages for secondary analysis out of which 30 villages were marked out for primary investigation. For primary investigation households were also selected randomly from each of the 30 villages. Around three per cent of households were covered under the study for secondary information the census smrees pertaining to consecutive three years, viz. 1971, 1981 and 1991 were extensively used. Findings of secondary data analysis were verified through primary investigation in the 30 sample villages.

Keeping in mind the theme of the research and the set objectives, suitable variables were identified and incorporated in the study. The variables are the nuclei or pivots of the study such as, tribes, hills intercepted with forests and tribal settlements. Variables which were treated as catalysts in the study are locational (distance of villages from urban centres, rivers, forests, altitudinal ranges), physiographic (highland, lowland, distance between settlement agglomerations and extent of villages), temporal (historical and contemporary trends in geographical factors), socio–cultural and economic (areal factors – cultivable area, forest area, culturable waste land, irrigated area; soil depth; demographic – total population, total tribal population, population density, tribal population density; cultural factors – tribal arable density, literacy, proportion of main workers, cultivators, health, crime rate, addiction, vegetational density, animal domestication, house type and electrification).

The selected variables helped to evaluate in detail the geography of the study area, prepare a perspective on the tribal evolution and location and test the efficacy of geographical catalysts in transforming the environment of the tribes. Simultaneously, an effort was made to detect and analyse association between various constituting elements and evolving problems. The retrospection of the whole study led to propose

planning and development measures for the eradication of problems and sustainable development of environment of the tribal system. The selected variables were put to rigorous statistical scrutiny, including analysis of correlation, test of significance and calculations of probabilities.

At the outset data on the selected variables were collected for the 110 sample villages from secondary sources and for the 30 sample villages through primary investigation using structured questionnaires and personnel discussion with village elders. Data thus collected were computed and tabulated using different statistical techniques, like conversion into percentage, measure of central tendency and dispersion, circulation, test of significance (student t test), analysis of variance and multiple regression. The statistical techniques and analyses were further assisted by the graphical representation wherever needed.

Geographical analyses tend to be incomplete without proper cartographic representation of the information in hand. Therefore, all the necessary techniques or tools including morphometric analysis have been applied to display numerical or subjective data in a visual form and represent the ground realities on the maps and graphs. Different computer programmes were used for computation and representation of both primary and secondary data.

The following hypotheses were formulated and tested through the study:

1. Geographical catalysts perform a significant role in the transformation of environment in space–time continuum multifariously.
2. Relief, climate and resource potentiality (physiographical phenomena) cast their impact on the demographic and cultural and socio–economic structure (human geographical phenomena) and vice–versa.
3. Geological, geomorphological, climatic conditions and bio–diversity of the region regulate the process of soil formation, cropping pattern, productivity availability of water resources, location of settlements and settlement patterns, accessibility and availability of mineral resources.
4. Infrastructural development increases the scope of socio–cultural and economic development.
5. Growth of population and consequential dispersion of settlements cause the transformation of the pre–existing environment and evolution of the contemporary environment.
6. Influx of and interference by non–tribals, government and non–government agencies are transforming the socio–cultural and economic homogeneity of the tribal regions.
7. Location of settlements are reciprocated by the environment.

8. Perceptions, preferences, evaluation, monitoring and decisions of man about the environment and his diverse activities depend to a great extend upon the environmental conditions and his awareness and mental ability and skill.
9. Deflective, repulsive and reflexive characteristics of tribes, tribal space and their environment are now reflecting absorbing and adjusting tendencies.
10. Plans and policies are infusing effective growth harmones for sustainable development.
11. Environment of a tribal region is self sufficient.
12. The imponderable cyclic and inter–causasive problems reveal the interruption, disturbance or deterioration in the cyclic eco–system. This signify, the need of resilience and commensurate enhancement or generation of basic attributes of ecosystem to solve the aggravating problems. In other words, the resilience or generation of one basic attribute of eco–system leads to the cyclic evolution of ecosystem and solution of the cyclic problems.

Every creation is either a foundation or an assisting tool for further explorations and creations. Every scholastic contribution reflecting the perception and knowledge of the researcher needs to be reviewed. Generally, the desires, demands and crises of a society guide and inspire the scholars to cogently cogitate and contribute to their respective fields of knowledge. Review of such literature was in fact a cognitive effort to ameliorate the study, though it was just like entering a dark wood with the hope of reaching out to the brighter end with a broader scope. Therefore, review of literature was carried out with an intention to understand the ideological strands, methods, concepts, findings and gaps in the area of study. The researcher in his effort reaches to the following conclusions.

Anthropologically and ethnographically the tribes and their environment could apparently be studied and standardized on universal plains. The contemporary archetypical remnants in the inaccessible remotes of the past and shrunken pockets of the present might explain the mystery regarding the origin and evolution of the tribes, the mankind as a whole and their environmental system.

Natural and human turbulence need to be studied and focused simultaneously to know the true nature of evolution of the tribal environment. Natural turbulence must have led to the human turbulence and thence influenced their mode of life. Some of the transforming characteristics adhered to the mode of life of man such as nomadism, hunting, gathering, shifting cultivation in the past and then settlement in the adverse conditions and hobosity (wandering in search of work) in the contemporary period

explain the influence of transforming environment upon the mode of life. This indirectly explains the change in the perception, anticipation and more specifically change in the mutual interdependence.

Struggle for survival seem to be a general law in space–time continuum. But the struggle of tribals kept on intensifying multitudinally with the diminishing resources such as forest and changing climate on the one hand and increasing demand within the system, growing competition, increasing interference of non–tribals and implementation of legislations and restrictive measures on the other.

Wealth and resources were the nucleic cause of struggle amongst men and groups. The struggle for wealth and resources with an objective to secure future survival would have resulted in social, economic cultural and political discriminations. The socially, economically, culturally and politically weak people, emerged as laggards, kept on receding and adjusting to the adverse conditions.

The diminishing symbiotism between the various phenomena within the system indicates the lack of futuristic approach while exploiting various resources. It is well understood that the monitoring and adjustment of various resources of environment was directed by the immediate needs. Therefore, the adjustment or mutuality between the man and other phenomena would have been selective. Man having regulatory role and being at the receiving end was supposed to carry forward their traditional knowledge about the significance of various elements, inter–causasive association between the elements and multitudinal integrity of the system.

Undoubtedly, tribal environment is unanimously perceived as a problem or crises zone and it is realized that there is a need to revive its proliferating characteristics and to make it sustainable. Simultaneously, the scientists have succeeded in detecting the cyclic and integrated nature of environment. But due to the lack of appropriate strategy and plan the problem has been aggravating. This could be simply because scholars, planners and administrators have not given due consideration to geographical factors which play a significant role in creating a sustainable environment and preserving the remains of naturally proliferating biomes or entities of the past. Similarly, we have failed to restrict the human interference into the self regulating and adjustable system.

The quest for achieving sustainability emanates from the objective of human survival. But man himself seems to be deviating from realizing the crises. The efforts of the government and other organizations seem to be infused with political and instantaneous interests. Their endeavours to satisfy immediate needs of food, fodder and finance go in vain and the problem persists. The effects of such instantaneous

efforts are liable to vanish and indicate the need of judicious implementation of sustainable development measures.

Generally, the remedial measures suggested by different scholars are merely either directives or suggestions, devoid of practical application of sustainable approaches. Due to lack of systematic practical model the problems keep on growing. This could be because of the descriptive approach adopted by the scholars.

Rarely any effort has been made to study the efficacy of geographical phenomena and evolve a model for problem detection or solution representing synchronization and synergies between them. At this alarming stage, there is need to think on universal plane and inseminate the seed of sustainable development at micro level to generate synergic impact at macro level. Therefore, multitudinally active microlevel planning based upon interdisciplinary approach and systematic coordination between various essential elements with an objective of sustainability, universal applicability and universal impact could have diffusing impact in space–time continuum.

A retrospection of the geographical environment of the sample area was undertaken by analyzing the spatial and human attributes. Description and analyses of these geographical phenomena were necessary for the environmental study of the area as they are the constituent elements which regulate the nature, transformation and evolution, specifically, of the regulatory processes or functions of the environment. An analyses over–looking these cannot lead to immaculate conclusions or inferences.

The analytical retrospection of the geographical environment comprises description of location, climate, geology, geomorphology, physiogrpahy. drainage pattern, natural resource exploitational units of space and population.

The sample area is located at the northern margin of tropical zone and in the vicinity of sub–tropical region. It exhibits arid climatic conditions and is one of the drought prone zones of India. The geology of the region reveals the effect of a series of geological actions and formations in many eras, caused due to redistribution of land and sea, tectonism etc. Similarly, geomorphology of the region is the resultant of varying temporal actions such as tectonism, transgression and regression, weathering, erosion, sedimentation, glaciation and climatic variations. The impact of climate, geology and geomorphology is evidentally visible in the evolution of contemporary topography and physiographic variations and drainage system. The topography is characterized by undulating dissected terrain composed of successive rugged ridges of moderate elevation separated by numerous ephemeral water courses and low lands. The physiographic divisions are classified as – southern highlands, central highlands or upland, western inclined low land, eastern inclined low land, and northern

land of isolated ridges and hills. Undulating, inclined land and resistant surface is comprised of many ephemeral streams. Nature of the surface leads to the high surface run–off and development of trellis and radial drainage patterns. Similarly, the location, topography, geology, and vegetation are not ideal for sufficient rainfall and water storage through percolation but the probability of inaccessible reservoirs cannot be denied.

The geological structure similar to many resource rich regions of the Indian subcontinent indicates the probability of significant mineral reserves in the region. In an agrarian economy soil is the most potent resource upon which the life of people and economy is dependent. But, the composition of soil do not display uniformly well developed horizons throughout the region. Resistant bed rocks, inclined surfaces, and arid climate favour mass movement, unconsolidation, ped formation and erosion. Exploitational units of space such as irrigated and unirrigated cultivable land, culturable waste land, uncultivable land and forest certify and reflect the nature of environment and economy. Growing population and thence demand is the cause for temporal variation in the proportion of different exploitational units. Such temporal variations are responsible for the transformation in the environment.

The area is evidentially tribal in nature as around 87 per cent of the population has been enumerated as Scheduled Tribe. Aggregate literate population is about 19 per cent whereas literate proportion in the tribal population is around 16 per cent. Only 32.26 per cent of the population is listed under the main worker category of which 84 per cent are cultivators.

The geographical phenomenon has laid great impact on the initial evolution and thereafter on the transformation of the tribes and their environmental system. The available literary explanations explain the magnetic influence of proliferating favourable geographical environment. The concentration or settlement of tribes at specific locations might have been the resultant effect of physiographical and socio–cultural elements. The socio–culturally mobilized or regulated masses might have selected resource rich natural abodes like forests, water bodies and inaccessible areas for their security and survival. This process of inhabitation and settlement can be related to both voluntary and involuntary motives of the tribes. Voluntary, inhabitation could have been regulated by inherently generating demands and priorities, whereas involuntary ones could have been due to pressure of society, culture or natural factors such as biodiversity and climatic conditions. A perspective on the evolution and location of tribes indicates that there was least possibility of distinctive genetic and ethnographic descendency, rather miscegenation and human turbulence might have been caused due to political or cultural turbulence. Inspite of, human turbulence the possibility of

partial seclusion cannot be denied. This could have been due to geographical barriers creating inaccessibility, escaping tendency to avoid confrontations and feeling of satisfaction in a sustaining environment. Therefore, it was felt necessary to analyse the causes of their settlement in a specific environment. So the causes of tribal location in forest rich environments or inaccessible geographical entities are explained through generalized theories, such as, self regulating random location, and induced location caused due to geographical and historical reasons including socially and culturally monitored spatial location.

The nature of the study and the objectives set froth there in, impelled to comprehend the role and efficacy of geographical phenomena in the evolution and transformation of environment. To evaluate the efficacy, various geographical elements are considered independently and thereafter, their efficacy on different dependent elements or variables is verified with the help of appropriate statistical techniques. The churned out quintessences are summarized below:

The geographical phenomena affect the nature of environment irrespective of time and degree of effectiveness i.e. the degree of effectiveness varies over time. It is so because variations in some phenomena have instant or immediate effects but many more show their impact in the long run. Similarly, the magnitude of effect do vary with the time, space and phenomena. For example, mining, tilling on hills and deforestation might have immediate economic effects but the impact on bio–geo–chemical cycle (life–supporting systems) would be a long–run effect of high magnitude.

The efficacy of geographical catalysts on settlements, socio–cultural and economic structure of tribes, dictate a regulatory role of geographical phenomena in the evolution and transformation of environment including man. Analyses of the probable efficacy of environmental phenomena and the crude realities are verified with graphical representation. The following results are derived through the exercise:

The settlements characterized by high altitude, riverine, forest or non–forest locations have high percentage of tribes. It also explains that the percentage of settlements located at high altitudes, along rivers, with non forest or forest areas and between the range of 15 to 30 kms from urban centres is directly proportionate to the high percentage of tribal concentration. The non–forest villages might also have been densely forested in the past. High concentration of tribal settlements in such locations dictates the role of some historical causes such as struggle for survival, security, resource availability and above all resilient nature of environment. Contemporarily, it is assumed that instead of failure and breaking of resilient potentialities of environment, people are bound to live in such systems. Probably the setup of organized administrative units, legislative measures and growing competition among groups

restrict their mobility. At the same time, the growing crises with growing pressure of population compel them to move to newer place for their sustenance but their mobility is limited with respect to space and time.

The percentage of villages with high percentage of forest area is very low and vice–versa, whereas, percentage of villages is directly proportionate to percentage of cultivable area. This indicates an extensive deterioration of forest area in the system where once forest used to have a cardinal role in building the society, culture and economy of tribes. The restricting legislative measures and deteriorating forests might have compelled them to depend completely upon crop cultivation. This indicates replacement of forest economy by the agrarian economy. But the high percentage of villages having high percentage of tribal population (about 80%) and tribal density (2 to 3 per hectare) indicates the growing pressure of population in an area of increasing demand of water, undulating terrain, lack of financial impetus and low literacy. Literacy is known to be one of the significant indicators of development but the contrasting relationship of percentage of literate population with the percentage of tribal population and villages of various locations indicates the backward state or underdevelopment of the tribals and the area.

Positive relationship between percentage of tribal population and the villages indicates the dominance of tribes in the area. But in the context of development, it would be irrational to ascribe dominance of tribes as the cause of the backward state. Rather, it could be related to time, space, administration and capital incentives. The temporal analysis of transformation of tribal environment given in chapter four gives similar explanations.

The positive relationship between the percentage of cultivable area and villages and an opposite hyping parabolic course of relationship between the distribution of cultivable area and percentage of villages in different locations such as riverine, non–riverine, forest, non–forest, varying distance ranges from urban centres and varying altitudinal ranges explains the prevalence of cultivable land in intermediary locations of favourable conditions. amidst undulating terrain. This is further certified by the identical trend between the percentage of cultivators and villages of various locations. Struggle for survival must have directed them to cultivate in favourable locations at a greater distance from the place of their habitation. This explanation is supported by similar relationship between the main worker population and villages of various locations.

The opposite hyping parabolic course of relationship between the percentage of forest area and villages of varying locations explain a break in the traditional relationship of tribes and forest. This could be because of historical reasons,

implementation of government legislations pertaining to forests and extensive exploitation by tribes and non–tribes.

Syllogistically, it is inferred that some phenomena which were active in the past, are presently inactive and vice–versa. For example, rich bio–diversity of the past was favourable for the resilience or conservation of water resource, combating erosion, fostering the inhabitants and regulating the bio–geochemical cycles. But the present rarified biodiversity is intensifying erosion, water crises and deterioration of eco–systems and bio–geo–chemical cycles. It is inferred from the above that all the elements or phenomena of environment are inter–related and there is inter–causasive cyclic relationship between them.

An inter–causasive relationship between the efficacy of various environmental phenomena directed the need to analyse mutuality between them. The analysis of association between the phenomena revealed that, locational factors like physiography, distance from urban centres, rivers and forests are still operative in deciding the concentration of population and settlements. Inhabitants of the hilly, forested regions might have initially settled at the periphery and gradually moved further interior after exhaustion of resources. The influxing population might have been either the laggards or opportunists of the past. Some of the existing characteristic features like low literacy, less electrification, low quality of houses, and high annual rate of crime with increasing altitude and distance from the urban centres might be either due to lack of uniform thrust in implementing plans and programmes or due to the lack of awareness of the masses. Possession and exploitation of land by the inhabitants (tribes) for satisfying their needs is showing great impact on the distribution of settlements or villages, tribes, vegetation density, literate population, electrification, domestication of animals and addiction to intoxicants. Cultivable land is anticipated positively by percentage of tribal population, literate population, electrification, animal domestication and mean extent of villages and, negatively by mean distance between settlement agglomerations, vegetation density, non–cemented houses and tribals' addiction to intoxicants. This replicates that economic betterment has triggered the positive response towards electrification, expansion of literacy, decrease in crime and increase in dense settlement agglomerations. The increase in addiction is surprisingly a negative effect. Literacy shows positive impact on the inhabitants. It is observed that wherever literacy is high, yield per hectare and electrification is high whereas diseased population, annual rate of crime, pellagra cases amongst children, addiction to intoxicants, number of non–cemented house and mean distance between settlement agglomerations is less. It is inferred that despite economic and educational betterment the density of domestic vegetation is not

increasing. The introspection of association of tribal concentration with other phenomena reveal that density of domestic vegetation, number of non–cemented houses, mean distance between settlement aggiomerations, pellagra cases amongst children, literacy, annual rate of crime and tribals' addiction to intoxicants are positively associated whereas, yield, domestication, diseased population, and electrification are negatively associated. The above relationship dictates their state of penury and underdevelopment.

The tribal region being characterized by hilly and undulating terrain, it was considered worth to introspect and analyse the association and anticipation of altitude with other phenomena. A positive relationship of forest area and distance from urban centres with the altitude explains that urban centres are located at relatively lower altitudes and at greater distance. This also explains that the forests are denser in the region of higher altitudes. Cultivable land, mean extent of villages, settlement type (non–cemented houses), domestication, annual rate of crime, pellagra cases amongst children, addiction to intoxicants and yield are positively associated whereas, soil depth, mean distance between settlement agglomerations, domestic vegetation density, percentage of tribal population, electrification and percentage of literate population are negatively associated with altitude. It is concluded from the above that with the increase in the altitude the concentration of tribal population increases. The socio–economic condition of tribes at higher altitudes is miserable. The topography might be a major cause for greater distance between settlement agglomerations and thence less concentration of tribals at higher altitudes.

Symbiotic inter–causasive relation and synergies generated between or within the synchronizing constituents of environment indicate that any disturbance in the equilibrium of system would generate transitive chain of problems or crises. It means, even a minor variation in one constituent causes proportionate variation in the inter–related or interdependent elements. The negative impact on any system could be caused either by deterioration in any constituting element or infusion of unwanted component into the system.

The growing crises in the systems of similar locations possessing similar characteristics are the result of both, the deterioration of physical processes and elements and infusion of unwanted human elements into the system. An excessive exploitation of resources by man activates physical processes like weathering and erosion, extinction of biological species, disturbance in the hydrological cycles and other life supporting cycles. The environmental problems are further aggravated by an excessive application of chemical fertilizers, pesticides and insecticides. This has led to the depletion of soil, water resources and biodiversity and activated eutrophication.

The above consequences are leading to the decrease of productivity, disrupted flow of energy in the system and a series of socio–economic. cultural and anthropological problems. Due to such disruptions and interruptions in the system, any effort by institutions in the form of material or financial infusion turn out to be inadequate to eradicate the problems and achieve sustainable development.

The planning and management of any environmental unit must be based on the analytical circumspection of the human behavior, behavior of the environment, interaction between and within them and the course of transformation in space–time continuum. Such an approach is necessary to detect the problem and understand the nature of functioning of the environment because these act as stimuli for framing planning and management policies for any environmental unit.

Moreover, the need of planning and management is solely to eradicate the problems and regulate the functioning of the environmental system properly. It is worth while to reiterate that the four steps of analytical circumspection of human behaviour, behaviour of the environment, interaction between and within them, and the course of transformation in space–time continuum would ultimately enable to decide objectives, approaches and strategies of planning and management. By adopting this approach the tripodal chain reaction development model for the sample area has been prepared in the present research. Regarding its applicability, it is assumed that similar slope detection model for detecting problems, interlinkage of problem and development model could be prepared for the development of similar systems.

Deteriorating environment of various parts of the world has impelled man to cogitate cogently about their prominent role as a proliferating node of life and anticipate accordingly but prudently to protect the present and secure the future well–being of mankind. Presently, many institutions are involved in finding the solutions to conserve and generate potentiality for sustainability but the results have not been very satisfactory. The rate of exploitation of natural resources to satisfy the ever growing demands of growing population is much higher than the rate of conservation and resilience. There is an absence of integrated geographical approach and involvement of the masses' in detecting the basic causes and their remedies. The growing demands of urban–industrial sector are being fulfilled at the cost of the inhabitants of the hilly environment. The lack of social liability amongst commercial and administrative units, encourage unscrupulous exploitation of the resources whereas the lack of awareness amongst the inhabitants inhibits creation of the desired conditions for sustainable development.

Undoubtedly, the above mentioned causes have been the major factors of growing crises in the representative sample area. It is also notable that crises are more intensified by the environmental peculiarities of the area. Though, the inhabitants can move towards

a self reliant agrarian economy, the plight of adhesive characteristics is causing friction. The adverse geographical conditions, such as undulating terrain; variability in the soil depth, soil structure, availability of water and scarcity of rainfall; declining biodiversity; increasing erosion; lack of economic ignition and uniform prudent thrust to implement plans for sustainable development of environment and its inhabitants, are independently and in association with each other exerting retarding effects on the tribal areas. One striking feature is that the life–supporting natural system and population dependent upon it are moving in opposite directions. Meaning thereby, the supply end is shrinking whereas the demand end is growing. This is indicative of growing imbalance in the environmental system.

The inter–causasive cyclic and integrated nature of environmental system directs the need of appropriate anticipation. Inter–linkage of problems verifies the fact and reflects the multitudinal translatory action of catalysmic events. This certainly directs the detection and activation of elementary phenomena with appropriate strategy and planning. The analyses of efficacy of temporal and geographical phenomena, inter–causasive nuclear and comprehensive association between the variables, interlinkage of problems, detection of problems and proposed tripodal chain reaction model based upon the activation of elementary variables in the present research is a small but conscient effort.

The present subject is like an infinite space and there are various vacuum areas related to it which are to be detected and focused. Therefore, adopting right approach for varying spatial entities, analysis and consideration of geographical factors, detection of the problems and conscientious interpretation of the system, multidisciplinary coordination and application of scientific techniques, while planning are necessary. Time and objective of planning are also very essential elements which need due consideration. The planning process while concentrating on eradicating immediate problems and satisfying instantaneous needs must have futuristic projection and simulation of the system. Lastly, it is emphatically suggested to review and focus on the past to churn out the essence of the problems and apply them while planning for the future.