

SUMMARY AND CONCLUSION

Planning is a basic human activity that involves thinking ahead and organising to achieve given objectives. Planning is essentially a process of a number of tiers of decision-making. The 3 tier panchayati raj institutions in West Bengal armed with 73rd and 74th constitution amendments play vital role in decentralized planning i.e., gram panchayat, panchayat samity and Zilla Parishad. The decentralised planning rests on three objectives: (i) appreciation of macro-level *spatially dispersed* economic activities pursued at micro-level/small scale at household and village levels; (ii) bringing the *peripheral groups* of poor and disadvantaged within the mainstream economic processes and (iii) *participatory mechanisms* in the planning to promote motivations of self-help and local level leadership.

Micro-level development planning over the last 20 years have made it clear that sustainable management of natural resources cannot be achieved without the participation of those who use these resources. The programs undertaken at the gram panchayat level are of direct relevance and of direct interest to the villagers. And when local plans are expounded, discussed and approved at the gram samity level, the villager becomes a participant in the process of plan formulation.

The participation and involvement of the common people in the planning process require that a part of the decision-making process should be left to the people themselves. They must decide on the priorities of development and to work out their solutions to pressing problems of the area in terms of their own perceptions of needs and priorities. Geographical Information System (GIS) and/or geo-informatics are computer-assisted system designed to capture, store, edit, display and plot geographically referenced data. It has the capability to make quick and unbiased decisions, which includes distance, directions, adjacency, relative locations and other spatial decision support mechanisms.

In spite of its vast natural resource base, Dhupguri is among the backward block in Jalpaiguri district as well as in the country. The long international borders with Bhutan coupled with huge influx of migrants since independence have made it a strategic location. Because of burgeoning population pressure, the natural resource base per capita is declining which in turn is creating problems of mismatch between demand and supply. On the other hand, ad hoc interventions on the natural system with myopic view are resulting in downslide

in quality of environment, resulting in the increase of frequency and magnitude of disasters. Among the perennial problems of Dhupguri, poor irrigation facilities, lacks in infrastructure and also routine flash floods resulting in large scale loss of properties.

The block produces large quantity of surplus fruits and vegetables. The lack of cold storage and marketing facility are major impediment to the growth of this sector. On the other hand, those factors influence unwarranted transformation of agriculture-land to tea gardens, which again face lower acceptability in the international market. Despite profuse reserves of groundwater, some parts of the block is still facing drinking water crisis. Deforestation has been a great menace. People virtually eking out on poor agriculture depend on forest produce and forest has been the surrogate source of income.

In view of the 73rd and 74th Constitution amendments, the integrated geo-spatial database at gram samsad level (the lowest of the 3-Tier pancheyeti raj institutions) and ward level (the lowest at ULBs) would play the vital role in guiding the decentralized planning processes in right direction. The multi-level geo-spatial digital database at a scale of 1:3960 on natural and cultural resources would be of immense help to all sections of decision makers in formulating and executing the various development plans at grass root level. The GIS thus, developed would reduce the dependency of development planners from guessing/ assuming in the planning processes and also equip them with the facilities of plan optimization. It will also helps the academicians and researchers to undertake further problem oriented in depth study of various aspects of sustainable optimum utilization resource appreciation.

The **geographical set-up** of the study area has been depicted in *chapter II*. Being situated in the foreland of the Himalaya is built of Quaternary sediments which show a distinct fractional differentiation starting from boulders and gravels in the root part of piedmont fans and terraces, at distance of 5-10 km from the margin turning to sand and farther downstream to sandy loam and silt. Geomorphologically, the area is diverse and complex in nature, exhibiting a wide variety of micro-landforms. Their genesis, mode of formation and morphological forms are diverse and have been characterised by successive catastrophic events of slope wash on the hill slope followed by accelerated deposition along the piedmont during the post-Pleistocene period. It is drained by innumerable south and southeast flowing rivers among which, Jaldhaka, Diana, Rethi, Gilandi, Kumlai, Angrabhasa, are noteworthy. Frequent flooding, bank erosion and avulsion are endemic environmental

problems, causing heavy damage to agricultural, forest, tea garden, communication and settlement.

Climate of Dhupguri block is characterized by hot and humid condition. The mean maximum temperature is 31.6⁰C and the mean minimum temperature is 21.3⁰C. Mean annual rainfall is 3466 mm. Most of this rainfall is received from May to September. Occasional high intensity rainfall in catchments area causes devastating landslides and flood. Ground water table is situated fairly near to the surface in the district except the northern part. Ground water table stays within a depth of 2 to 10 meter during the summer except northern part. Though water resource potential is enormous so far irrigation facilities tap only a minimal fraction of this resource.

Among the natural vegetation, Sal is gregarious but it is found in mixture of a varying proportion of the following species like *Terminalia*, *Chkraisia tabularis*, *Lagerstroemia parviflora*, *Amoora rohiruka*, *Careya arborea* etc. Riverine forests are found in sandy soils near river beds dominated by *Acacia catechu* and *Dalbergia sissoo*. Wet mixed forest are found in the relatively low lying and in damper areas with better edaphic condition, includes *Machilus spp.*, *Listsaca spp.*, *Cryptocarya spp.*, *Cinnamomum spp.*, *Actiondaphne spp.*, *Meliosma spp.*, *Eugenia spp.* etc.

Tea garden, occupy a large part of the block covering 19% of its geographical area and form a characteristic land cover. Among the cultivated crops rice is the most important. In addition to organized Tea industry, many types of small scale and cottage industries have grown up to cater the growing population. Of late, tourism industry is gaining ground yet the poor infrastructure facilities impede the desired development. Dhupguri is well connected by rail and road network with neighboring blocks as well as to the other districts of the state. Principal traded commodities exported are timber, tea, vegetables and agro-products.

Attempt has been made to analyse the **land and water resources** of Dhupguri block in *chapter III*. The soil of Dhupguri block is characterized by its coarse texture, low water retention capacity, acidic in reaction (5.1 to 7.3) and poor in organic matter (0.5 to 2.2%), nitrogen (0.03 to 0.2), phosphorous (29 to 40 kg/hector) and potassium (100 to 150 kg/hector). About 24% of the total geographical area is covered by forest. Taxonomically, the

soils of Dhupguri block have been classified into two orders, three sub-orders, six great groups and seven families. Out of these, Typic Fluvaquents occupy 36.95% of the total geographical area of Dhupguri block. This is followed by the soil family Typic Haplaquents that occupy 15.44% of total geographical area of the block. The taxonomic soil classification of Dhupguri block as presented may be treated as a provisional one, and further field study, specially along the less accessible tracts are required to improve upon the quality and acceptability of the given classification.

The high intensity rainfall on generally deforested sloping ground causes high run-off and consequently less water becomes available to saturate soil and recharge aquifers. Out of the total surface water yield of 1186.6 m.m³, nothing has yet been used commercially. It is thus, imperative to find out suitable ways and means to conserve such huge un-utilised surface water resource.

Hydro-geologically, the block is located in porous alluvial formations with reasonably good yield rate. The Central Ground Water Board estimated a yield rate of 150m³/hr, the highest in the state in areas under Dhupguri block. Ground water quality of Dhupguri block has been found satisfactory. The concentration of Arsenic, Fluoride, Nitrite and Chloride is found much less than the permissible limit. However, some parts of Dhupguri block have been identified as threshold area in terms iron contamination in ground water.

Being strongly influenced by the physical set-up Dhupguri block demonstrates a unique example of diverse level of human adaptation and appreciation of natural resources as shown in *chapter IV* under the heading of **cultural resource status**. There have been three distinctively identifiable zones: i) vast tea garden belt of the northern half, b) rural agrarian area of the southern part and c) forest area of the north eastern part. Each has its own level of resource appreciation and level of development. The highest level has been noticed in the tea garden area and the lowest in forest belt. The agrarian belt shows varied degree of intervention as well as appreciation. It is interesting to note that the northern tea gardens and forest areas are dominated by ST while the agrarian belt is dominated by SC population. It also reveals that tea garden dominated GPs recorded more number of school drop-out.

Generally, the dominant occupation of southern part of the block is dominated by primary activities like cultivation and that of the northern part is dominated by secondary

activities like tea garden workers. 46% of the total family has been identified as cultivators and another 40% of the total family has been identified as tea garden workers. 7% of the total family depends on business as dominant occupation and another 5% has been identified as dependent on Service sector. The remaining 2% has been identified as to be dependent on industry mostly small in sectors.

It is a matter of great concern that a huge number of over 12.71 million man-days have found available per annum in Dhupguri block. This clearly exhibits the non-existence of any job opportunity in the villages other than already saturated arable farming and tea gardens. As a result, 37% of the total family of Dhupguri block has been identified as economically backward and defined as BPL (Below Poverty Level).

Cow, buffalo and goat constitute the domestic and supportive animal resource in rural agrarian economy of Dhupguri block. Out of total 84,902 cows and buffalo 60% and out of 111,514 goats during the survey period (2004-06), 56% owned by the family belongs to the SC community. Interestingly, the SC community constitutes 50% of the total family that owned 60% of the total animal resources in the block. Conversely, the ST communities owned only 14% of the total cows and buffalo and 18% of goats in spite of the fact that ST community constitutes 22% of the total family in the block. Thus, it is very clear that the ST community lacks in animal resources as alternative/supportive economic activity.

Dhupguri municipality shows tremendous growth potential with its vast rapidly growing agrarian hinterland under the backdrop of its location advantage at the major transport node between Northeast and the rest of the country. The study demonstrates huge spatial disparity among the wards within the municipality. The municipality exhibits densely populated residential cum commercial establishments in some wards at the same time vast tracts of agrarian land with low density rural settlement in the others.

Contemporary **development processes** have been scrutinized in *chapter V*. It is strongly observed that the local level need based developments are better absorbed and are applied effectively, when mandated by functional groups rather than individuals for better economic development. At a large social context this results in sustained alleviation of poverty and increase in income level of the individuals belonging to those functional groups

directly and more so indirectly, of the local society in the arena in which these functional groups belong and thrive.

It is noted that poverty can effectively be dealt with if local level appropriate plan, technology and organizations of the people are combined together. While the technology would help people expand their choices to lead lives that they value, the organization would generate social capital to meaningfully utilize the technology for the common good. Adoptions of technologies are often mediated by social factors like attitude and values. Technology has often been seen as an elite domain over which common people cannot have access and control. Examples to the contrary are abound which suggest that if the poor are enabled using appropriate strategies and inputs they can have the benefits of technology to reduce their drudgery and poverty. For practical purpose, technology and organizations have been considered as independent variables where as poverty has been taken as dependent variable.

The **development geo-informatics** aims to provide the PRIs and ULBs level development planners with multi-level geo-spatial digital database on natural and cultural resources of the block and shown in *chapter VI*. The geo-informatics aimed to provide a scientific base for agricultural, industrial, socio-economic and human resource development on a sustainable basis taking into consideration the latest ground reality. The development planners at the field level will have the access to available potential resource for further exploitation/use as well as possible hazards to be encountered and human resource available at panchayet to block level in computer compatible format. The anthropogenic activities along with infrastructure data will also be documented.

Therefore, the development planning at grass-root level will be hopefully based not on assumptions but on dependable database. The quality of planning and intervention will, therefore, be unbiased and realistic, scientifically sound and environment friendly. The outputs will be beneficial to all the sections of the society and expected to be utilized in decentralized planning for poverty alleviation.

Socio-economic survey 2008 in Dhupguri municipality reveals many interesting scenario of this one of the youngest municipality in the State. It shows tremendous growth potential with its vast rapidly growing agrarian hinterland under the backdrop of its location

advantage at the major transport node between Northeast and the rest of the country. The survey report also demonstrates huge spatial disparity among the wards within the municipality in almost every sphere of socio-economic life among the relatively urbanized wards like nos. 14, 4, 3, 5, 6, 11 & 12 and the rural wards like nos. 1, 2, 9, 15 & 16. It reveals the development has been taken place rapidly along the arterial routes i.e., the NH 31 and the SH (Falakata Road). Most of the commercial establishment i.e., shops, hotels, medical outlets, markets etc. are also located along the major transport routes.

Socio-economic survey also reveals major shortcomings in terms of intervention vis-à-vis development in Dhupguri municipality. Unscientific, unplanned and myopic expansion of the town has already exerted tremendous stress to the urban environment. Inadequate infrastructure aggravates the problem further. The drainage problems become acute in the monsoon months due to heavy rainfall and the low-lying area become precariously water logged. The lacks in proper drainage management for both sewer and storm water disposal system. It is surprising that many wards still do not have any sort of man-made defined drain at all.

Traffic congestion also becomes a serious problem as the town especially along the crossing of major transport routes. Lack of proper bus/truck/taxi stand along with parking lots aggravates the problem further. Immediate proactive attention should be taken to ease out the problem. Dhupguri Regulated Market is the single largest commercial establishment which has tremendous impact on the overall development of Dhupguri municipality. In spite of its considerable infrastructure certain critical linkage should be adhered to the proper distribution of its potential to the downstream to the overall socio-economic development of Dhupguri municipality.

It is expected that the future development vis-à-vis expansion of Dhupguri municipality will take proper care of her vast and very dynamic agriculture sector which still the most important economic activity in municipal area. In fact, the commercial base of Dhupguri is also directly linked with the agro-products of the municipal area and its vast agrarian hinterland.

An Attempt has been made to **situation analysis** including SWAT and backwardness index have been attempted in *chapter VII*. The main objective of the

backwardness index is to guide such activities and such public finance investments under poverty alleviation programmes like RSVY, NREGY etc. adopting the principle of “putting the last first”. This can be achieved in the first place, by ranking the 258 gram samsads in Dhupguri block on a scale of relative backwardness, based on selected indices.

Development has not reached every corner evenly. There are regional variations and contextual differences. Some assistances and inputs have been better absorbed than the others and therefore impact and outcomes would be different. While we analyse the growth process of the region, it is noticed that some of the pockets or some of the areas still lag behind other regions of the same administrative unit. Dhupguri block is not an exception in this respect. Many governmental interventions or stakeholders’ interventions through particular track over progress have endeavoured to distribute for its development evenly across regions and communities. To do so in Dhupguri block, with fairly large population of Scheduled Castes/Scheduled tribes, identifications of regions/pockets within the block which are less developed is very important and rather it is a necessity as a development strategy. A bitter truth, one is confronted with, is that certain section of population of those areas always suffers that they are not having adequate opportunities for bringing some economic development for themselves, their families and their areas.

Application of geo-informatics at PRIs level decision support has been demonstrated through a number of case studies in *chapter VIII*. The study emphasizes the power of GIS technology which will help the PRIs and other decision makers to better understand and evaluate spatial data by creating graphic displays using information stored in the database hosting the maps in such a way clients can view the information query.

It has demonstrated that a block like Dhupguri which has immense potential of development and has maximum ST and ST population residing in rural area urgently needs a GIS based e-governance system such that it will help the PRIs and decision makers in planning, implementation and monitoring of various projects for development in different fields at much faster rate which in turn will usher a new era of informed planning processes for sustainable development planning.

- To provide the development planners and PRIs an accurate spatial view of the CD block at different levels such as gram samsad, gram panchayet as well as land use, infrastructure allocation, road and rail network, drainage etc.

- To provide the planners detailed demographic data and education & health related data on desktop in a GIS environment.
- To assists the planners in finding out the possible locations for the schools and health centers depending on several parameters such as for health; population density, number of health centers required and its optimum location, number of disease infected persons etc. and
- As GIS does more than just display the data; it enables the user to dynamically analyze and update the information linked to those locations spatially and can further strengthen the e-governance.

A number of case studies has also been attempted to demonstrate the PRIs and line department personnel who are entrusted to take the crucial decision making at ground level on various development and income generating and/or enhancing schemes mostly sponsored by Centre and the State Governments. Keeping in mind the ground reality in its proper perspective an effort has been made to develop a few simple cases with an aim to demonstrate the utility and usability of developed geo-database in Dhupguri block in the processes of development planning i.e., locating sites for new SSKs (Sishu Shiksha Kendra) and crematorium in.

The geo-informatics thus proposed aimed to provide a scientific base for agricultural, industrial, socio-economic and human resource development on a sustainable basis taking into consideration the latest ground reality. The development planners at the field level will have the access to available potential resource for further exploitation/use as well as possible hazards to be encountered and human resource available at pancheyet to block level in computer compatible format. The anthropogenic activities along with infrastructure data will also be documented.

The development planning at grass-root level will be hopefully based not on assumptions but on dependable database. The quality of planning and intervention will, therefore, be unbiased and realistic, scientifically sound and environment friendly. The outputs will be beneficial to all the sections of the society and expected to be utilized in decentralized planning for poverty alleviation.