SYNOPSIS

The present work is a comprehensive and humble attempt to shape the volume ‘Environment, Economy and Gender: a Study in Socio-Economic Status of Women in the Mining and Industrial Areas of Barddhaman District.’ The focus of the study is cantered upon the investigations into the questions whether the coal mining and industrial activities in the western part of Barddhaman district have wielded any environmental, economic and social effects upon the communities living in the area in general and the women community in particular in one hand, and to find out the possibilities that whether such effects could be eliminated by any suitable alternative management systems on the other hand.

The main objectives of the present research is to examine the changes occurred in the mining and industrial economy followed in the area for the last fifty years; to explore the effects of those changes on the environment of the area under review; to investigate into the changes in the rate of participation of women in the economic activities and to find out the nature and magnitude of afflictions suffered by the women folk as increasing rate of unemployment enforced by the deterioration and closure of the production units. The objectives of the present study rationally incorporate the hypotheses and research questions.

A geographical space has its own set up in association with its physical components like geology, topography, surface and sub-surface hydrology, soil, climate and the biological components like flora and fauna. These components with their interactive systems and functions form an ecosystem unique to that region. The stability of that ecosystem depends upon the interactive processes maintained by the sets of the physical ecological phenomena and the changes brought down by the human activities in course of their purposive economic and socio-cultural commonly aiming at the maintenance of an ecological equilibrium. When the level of this equilibrium is disturbed, negative impact upon the environment of the concerned region then becomes inevitable. This disequilibrium brings out qualitative and quantitative changes in physical ecological components which directly affects the human ecological aspects through the effects upon the economy and social lives of the people inhabiting in that space.
Employment of a male member of a household in the production activities, mining and industry as in this case, has a definite positive effect on the economic and social environment. Participation of women in income activities is not only helpful for a household, but also have good effects on the nutrition, health and education of their societies. Increased unemployment of male population has direct effect upon their family through pressing upon the status of women and education of children. Increased unemployment due to closure of coal and a larger number of factories have resulted in the degradation of environment, hardships in the economic and social condition of the people, particularly of the women folk. Participation of women in production activities is considered as an indicator of development. The economic base of the area is facing crises particularly from the early 1990s following decline in production of mining and industrial sectors consequent upon decline in job opportunities.

The theoretical considerations which appear as relevant to the objectives of the present work include the very broad concepts of land as amalgam of resources and as an ecosystem as well as the environmental balance in general and also the relatively fragmented but locally very important questions of coal as resource base, mines and industries as economic bases affecting economic and social life of people and decline in the state of resource process have differential impact on gender.

The premise upon which the study is based is that the area under review experienced a gradual shift from subsistence agrarian economy to mining and industrial economy mainly from the early nineteenth century. Large number private coal mines were opened which were ultimately nationalised in 1970s. On the basis of coal as cheap fuel energy, a number of private and public industries, mainly iron-steel and allied, emerged in a number of places of the area. But just from the early 1990s, the majority of the mines as well as the industries started to experience decline in their state, a number of pits were abandoned or closed and majority of the industries followed the same fate gradually. For its validity, the premise itself depends upon unmistakable evidences of abandoned or closed mines though it is reported that there is enough reserves of coal in their disposal, and a number of large and medium scale non-functioning industries located in the area under review. The whole discussion (Chapter 1 to 7) concerning the location of the area, the nature and magnitude of environmental, economic and sociological impact of the mines and industries on the resident people and women community in particular may be summarised as below:
1. The western part of the Barddhaman district of West Bengal state has been selected as the area under study. The area is rich in coal seams of high carbon content promoting coal mining as principal economic activity and there have grown a number of iron-steel and engineering industries in a number of places developing them into mining and industrial towns. The mines and industries themselves accommodated a large number of people as workers of different categories and simultaneously helped develop a considerable range of allied industries and tertiary sectors within the area. Extending from 23° 24′ 30″ North to 23° 53′ 00″ North latitude and 86° 48′ 00″ East to 87° 32′ 30″ East longitude, the area under investigation, western part of Barddhaman district is located on the western margin of the Rarh Plain and the eastern margin of the Chotonagpur Plateau covered with lateritic soils and old alluviums. It is composed of the most important mining-industrial zone of the Barddhaman district. The area is bounded on the north by the Ajoy river and Birbhum district; on the east by Kanksa Block of Barddhaman district; on the south by the Damodar river and Bankura and Puruliya districts and on the west by the Barakar river and Dhanbad Police Station of the Jharkhand state. In terms of Sub-Division level administration, the area comprises Asansole Sub-division in west and Durgapur Sub-Division in the east. In case of Durgapur Sub-Division, all the Community Development (CD) Blocks as administrative units have not been considered in this analysis as it seems unnecessary because these Blocks do not have any mining-industrial activity. The administrative units of the study area comprise Andal, Faridpur and Padabeshwar CD Blocks and Dugapur Municipal Corporation of Durgapur Sub-Division; and Barabani, Jamuria, Hirapur, Chittaranjan and Salanpur CD Blocks and Jamuria Municipality, Kulti Municipality, Raniganj Municipality and Asansol Municipal Corporation of Asansol Sub-Division.

2. The area consists of the meta-sedimentary rocks of the Precambrian age, Gondwana sedimentary rocks, Rajmahal basalts and Upper Tertiary sediments. Laterites have developed on these older rocks as well as on early Quaternary sediments. The most relevant fact in this context is the presence of a series of coal measures which played the fundamental role in emergence of mine as well as industries. Among those coal measures, the Barakar measures occur as an irregular belt roughly parallel to the
northern boundary of the area in question, covering nearly 155 Km$^2$ area and thickness of 640 meters. Deposits of ironstone and shale cover an area of 113 Km$^2$ with 365 meters of thickness. The Raniganj measures crop out along the southern half of the famous Raniganj area. Several coal seams are found in both the Raniganj and Barakar measures. There are 23 seams measuring over 1.2 meters in thickness. Out of these 23 seams, 11 are located in the Raniganj and 12 in the Barakar measures. Coal seams in the study area are located in: Taltor, Sanctoria-Ponibati, Halnal Koithi, Dishergarh-Salma, Bara Dhemo-Raghunathbati-Rana-Pariharpur-Satgram Sonpur, Sripur-Topsi-Kenda, Chora-Purushottampur, Kajora-Jamad-Bankola,Gopalpur-Uper, Dhadka-Ghusik-Upper Kajora.

3. The area is composed of several stows, consisting of small and shallow valleys and low convex spurs running almost in all directions thereby forming a radial drainage pattern. The Ajoy–Damodar divide is a convex plateau. Salanpur, a busy coal mining, wood processing and earthenware manufacturing centre; Rupnarayanpur, the centre of cable industry and Chittaranjan, famous for its railway locomotives are all located on this divide. From the south, the district boundary follows the left bank of the Barakar. The Barakar is more than a mile broad at 23$^0$45’N latitude. Scars of gully crossing along the tributaries of the Ajay and the Barakar as well as along Nunia Khal (creak), a tributary of the Damodar, is very pronounced. Most important of these is the Nunia Khal which peculiarly turns non-perennial in its middle course and after receiving an east following non-perennial tributary a mile north-east of Asansol, flows in a south-easterly direction. The Ajay receives 9 north–flowing tributaries, all less than 11 km. in length. The crest of the Ajay-Damodar watershed is within 8 to 13 km. from the Ajoy channel. This area is characterised with low undulating relief with radial drainage pattern and graded inter-stream tracts sloping down to broad valley floors. Ajay stow in this area does not display interrupted valley profiles and truncation of rocks of varying resistance, but this incipient peneplain has retained some of the deep residual laterites and red clay soils which formed on the old-age surface. The north-eastern edge of the Ajay-Damodar interfluve is drained by the Tumni and the Kunur River. Tumui takes off from a heavily dissected place, a little north of Haripur and flows east parallel to the Ajay. The height of the Tumni-Ajay interfluve ranges between 60 m and 100 m. While that of the Tumni and Kunur between 60 m and 120
m. The southern half of Durgapur Sub-Division extends from the Singaran Nala on the west to the Anderson weir and upper-catchment area of the east-flowing Kharia Nala and the Banka. The Damodar in this area has become very broad in its width. The lateritic areas, which extend up to the Galsi Police Station, are very poor in nutrients.

4. The area under study lies in the humid tropical monsoon regime. It is characterised by (i) hot and dry summer from March to May (ii) Monsoon or rainy season from June to September (iii) a brief autumn involving October and November, and, (iv), a cool pleasant winter from December to February. The temperature rises rapidly from the beginning of March with the onset of south west Monsoon at about first week of June. This results in an appreciable drop in temperature. The temperature begins to fall from November. The amount of mean summer temperature is 31°C, recorded in May and the mean winter temperature is 17°C, recorded in January. July is the rainiest month of the year. It may be noted here that Asansol town experiences more temperature in summer compared to any other part of Barddhaman District. The area under study as a whole receives an average annual rainfall of 1469 mm, but it shows considerable variation in its spatial distribution (901-1469 mm),

5. The study area is characterized as one of the populous regions of West Bengal. The number of persons and the population size of the urban concentrations have greatly increased within the last 50 years. Its demographic structure has been greatly modified due to the opportunities offered by modern economic life, which constitutes the main attraction drawing migrants to the to this mining-industrial belt. Before 1872, no regular census of the district had ever been taken though several rough attempts were made from time to tie in estimate the number of inhabitants. The increase of population in the area is due to both natural increase and migration. In the highly industrialized Sub-Divisions of Asansol and Durgapur, the wage–earning immigrants from outside the state live in large numbers. With rapid industrialization which took place in the in the area, a steady decrease in the percentage of Bengali speakers is noticeable which signifies immigration of people who do not speak Bengali. Opening up of coalmines in the Raniganj coal belt and subsequent establishment of iron foundries and other industries in Asansol, Burnpur, Kulti and Barakar were the main attractions to the bulk
of immigrants. The largest number of immigrants entered into the area during the period 1951-1961 and settled down in Asansol and Durgapur Sub Divisions, because this decade saw the rise of the Asansol-Durgapur industrial complex. Further, two decades, 1961 to 1981, have witnessed rapid rate of population growth.

6. Various data on population and work participation confirm that there is a critical gender gap in work participation, both in mining, industrial and tertiary sectors of economy. The number of women in mine and industries has been drastically reduced since the early years of the 1980s. The males outnumber the female in literacy almost in all parts of the study area. The area under review recorded a sex ratio of 876 in 2011 for General Caste population. On the other hand, sex ratio of the SC population in 2011 counted for 934 and for ST population, the same counted for 979, which is significantly higher than General Caste Population. The sex ratio for total population points out a gradual increase wherein both the SC and ST population are incorporated, but specifically for SCs and STs the ratio started from a satisfactory rate, and for 2011, the sex ratio of SC population touches the national average and for ST population, the sex ratio comfortably exceeds the national average.

7. The main occupational sectors of area are manufacturing and household industries, cultivator sector, livestock, Transport and storage, construction, mining and quarrying etc. The most important feature of the occupational characteristics of the area is that this is the only area of the state where mining of coal opened the opportunity of employment of a large number of workers even since pre-independence period. Similarly, various units manufacturing and household industries employed huge numbers of workers in those units. As data on various occupations for pre-independence is very scanty, we have to rely upon the data available in the census handbooks, from 1961 to 2011. These census data show that the increment of number of workers, specifically in mining and manufacturing industries, was noticeable during the period 1961 to 1981 period and followed a gradual decline since then and the number of non-workers increased. It also shows that reduction of female workers in those sectors were more high than the male workers. The decline of the state of mining and industrial activities was clearly consequent upon the reduction of workers and simultaneous increment of non-workers. Sometimes, the unskilled workers find
their occupation in agriculture, but throughout the area, as agricultural lands were acquisitioned and both underground and open-pit coal mining caused degradation of agricultural lands, agriculture could not accommodate the workers excess from the mining and manufacturing sectors.

8. The most serious impact of underground coal mining is subsidence. The voids are filled in by sands whose degree of compaction is always questionable. The surface area above the voids of the coal mines are quickly affected by coal mining through subsidence which damages the structure like buildings and roads. It is true that the ECL has acquired the lands from the landholders with definite scheme of compensation in monetary terms, but land as a basis of livelihood cannot be compensated for by exchange of money or offering employment of one or two members of a household, because a reserve of mineral in an area is ‘limited’, implicit in the concept of ‘spaceship earth’. After exhaustion of coal, the continuation of job in the coal fields should come to an end. Mines are then abandoned along with heaps of debris making the entire area derelict or wasteland.

9. Impact of underground coal mining on agriculture is manifested with various facts. The ECL is empowered to prohibit the farmers to cultivate the land in purpose of agricultural production. Thus the lands above the coal seams and around coal mines have been kept fallow for long only to make it uncultivable. Seepage of water from surface lands to the mines has made soil dry in most cases making it unproductive. Crop failure is obvious in places where unauthorized farming is done in small plots due to speedy seepage and inadequate retention of water. Degradation of land and soil has reduced the productivity of crops wherever agriculture is possible in small scale.

10. Underground coal mining has definite impact on surface and sub-surface water. The surface water bodies of the area have been affected by underground coal mining. Ponds, tanks and small rivulets of the study area become totally dry during the summer spells due to percolation and seepage of water consequent to underground voids made through extraction of coal. The waste water pumped out of the mines is released to the low land and creaks and they readily become the source of contamination. The waste material and debris heaped up near the mines are washed down by rain water and is mixed with run-off water during rainy season and stored in water bodies located far enough from the source. The varieties of machineries run by diesel and used in
mining and transport of coal add oil pollution to surface water sources. The coal washery-effluents consist of high TSS, Iron content and oil and grease, high TDS and COD values of river water as well as blanketing effect of coal slurry particles on the bed of the river is appeared. Suspended solids act as a physical pollutant which degrades the beds of receiving streams and eventually reduces biodiversity.

11. In the area under review, mainly during pre-monsoon period, the groundwater flow pattern is influenced by mining activity. In general, DTW in such areas varies from 7-18 MBGL around active mine establishments, but DTW declines considerably in wells due to seepage of groundwater into mines and even wells get dry during summer which is most prominent in the vicinity of coal mines. Huge amount of good quality water discharged into the mines from the zone of weathering, the sections of alternating jointed, fissured sandstones, thinly laminated shales, intercepted in galleries during mining activities. The gradient of water table varies from 4 m/km to 10-20 m/km. For mining operations, substantial quantity of water is pumped out from various collieries of CMPDIL. For example, Asansol is estimated to be 0.25 MCM/day in dry period and 0.39 MCM/day during monsoon. Contaminated water pumped out from the mines pollutes the nearby sub-surface aquifers as well as surface water. Mine water and washery effluents affect the chemical quality of ground water. Mine water contain high amount of $S_0^4$, hardness and bacterial contamination. The contamination of ground water is a frequent hazard as the remediation of aquifers is rarely successful.

12. The environmental impacts associated with open cast mining practice differ to those associated with underground mining. Open cast mining needs land acquisition and results in a new land use pattern making waste land in the long run. Sometimes, in places, it removes huge amount of earth materials along with good quality of soil thus reducing the provision of agriculture. Simultaneously, the mounds of earth material and debris derelicts considerable stretch of land where these are deposited. Open cast mining, in places, removes considerable stretches of forest / vegetation cover and thus brings in damages to biodiversity of the area concerned. Removal and transporting of overburden needs construction of roads which bring in damages to land. The local topographical feature is changed which is consequent upon the change in the direction
of run-off and flow of water. New water bodies are formed after abandonment of the mine and surface water seeps down to the pits and drying out of the nearby lands become obvious and soil erosion occurs around the mine site. Open cast mining activities for coal extractions are carried out at a depth of 100-300 m. The process of coal blasting causes a lot of noise problems. Narsamuda, Ratibati, Barachak and Tilayabad villages are mostly affected by this kind of impact. In Asansol and Raniganj area, around 38.75% and 44% villages are affected respectively due to these problems.

13. Coal mining activities are directly linked with deformation of sub-surface geology and surface topography. Establishment of coal mines and extraction of coal are thus cause land subsidence and land degradation. Degradation and derelict of land have direct impact upon the fertility and productive capacity of soil sometimes resulting in failure of crops. In total, 8.75 % and 26% percent peoples suffered in Asansol and Raniganj due to subsidence of agricultural lands along with settled areas in rural parts. Their agricultural lands are now fully converted in to fallow / barren lands. The villages like Fatehpur, Barachak, Narsamuda and Egara villages are severely affected by this kind of hazard. Mining and agriculture are directly linked through agriculture’s dependence on mined inputs, land and water resources, and workers. Most noticeable fact in this context is that the number of workers in the mines and industries has decreased substantively, but the number of workers in agriculture has also been decreased which implies the decline in potentiality of agriculture.

14. Open cast mining in some places have either destroyed or diverted the directions of these streams consequent upon the hydrological regime of the area. The slurs of coal and dissolved soil mix in the surface water. A thin film of coal slurs makes a coating on the water surface that reduces the amount of dissolved oxygen in the water and increases BOD of water. The depth of the surface water bodies is gradually reduced due to continuous deposition of soil and debris and quantity of water is reduced. The water bodies are thus gradually eutrophicated and the aquatic fauna and flora are affected. The study area is located on the Ajoy-Damodar interfluves which has a number of small rivers and streams. Open cast mining in some places have either destroyed or diverted the directions of these streams consequent upon the hydrological regime of the area. Open cast mining alters the direction and rate of sub-
surface water flow. Due to excavation, open cast mining also affect the quality of ground water through pollution with seepage water.

15. The women are more affected by degradation of natural environment as they are more close to the nature than men. The coal mines are established on the land after replacing the biotic components or flora and fauna. Elimination, or more truly, termination of these biotic resources have direct impact upon the women as in many cases the rural women are dependent upon those resources for their health and nutrition. The wild roots, medicinal herbs, seasonal wild vegetables, small fishes lived in rainfed small ponds and streams could compensate for their nutritional and medicinal needs. Impact of mining on women is concerned with their health and social status. They are more exposed to the pollution of air as they have to stay in home for day long and compelled to inhale polluted air, whereas the male folks stay outside the home in day time for searching of livelihood. Similarly, to perform domestic works and nurturing of the kids, they come in contact with the polluted water more frequently than the males. Thus mining environment has more effects on the women even to them who they do not work in the mines.

16. Closure or decline in the status of industries is coterminous with the decline in the economy of not only the households directly related with the industries as workers, but also the mass of the population indirectly related with the activities linked with smooth functioning of the industrial units. The economic condition of the workers becomes problematic when they lose their job due to closure of the industrial unit or the factory they were working in, economic hardships then press upon their purchase power. Reduced purchase power directly affects the other sectors of the market economy as goods and commodities do not find market for purchase and sale. Economic depression results in burden on the investment of infrastructural development. Infrastructural deficiency fails to attract new investors. Thus the people do not find alternative opportunities of earning. The tertiary sector of economy is directly linked with the secondary sector like industry. The contribution of the tertiary sector to the economy then also suffers. The increment in the non-working and marginal workers of the area under review reflects all these facts. Peaceful social life is related with education, health, political and social systems and obviously, to a great extent, particularly in capitalist system, with the
condition of economy which again dependent on secured source of income. Insecurity of income leads to economic deprivation when, mainly the poor people easily become the soft target of moral degradation which leads to addiction of liquor and alcohol.

17. The economic hardships are the resultant outcome of the decline in the status and closure of mines and industries in area in question. Women community in the societal structure of the area as part of the Indian patriarchal social system are always treated as subordinate to the male in one hand, and dependent upon the earnings of the male members of the family on the other. They receive much less calorie for their living compared to the males. But, as they have responded during oral interviews, the situation was better when the economic condition was good due to secured earnings from mining or industrial employment sources. Literacy is most important indicator of human development. The economic hardships due to closure of mines and industries have definite impact upon the rate of the female literacy of the area. The table 6.4 shows that though there are various incentives from UNESCO, UNDP, the Union and the State Government, the rate of female literacy in the area has decreased gradually from 1999 to 2011, with a gender gap in literacy figured to 18 per cent.

18. The area under investigation possesses a number of problems. The problems of environment, economy and gender gap in relation to decline in the state of mines and industries dealt in this work have both qualitative and quantitative differences in effects in relation to mines, lands, water and people. The people living in the vicinity of coal mines and near the industries suffered differently in relation to the people living in the considerable safe distance from the core areas of degradation, subsidence and pollution. Likewise, the people having economic security for sustenance do not suffer in the same magnitude as the people experiencing economic constraints. In the same way, the afflictions suffered by the group who were directly linked with the mines and industries but lost their jobs due to decline in the state of industries but couldn’t find out any alternative means of livelihood than the group who have been able to find out alternative means of livelihood. The problems of economic hardships have affected the majority of the population of the area with differential scale but the women are more affected with characteristic gender gap in work participation, socio-economic status and literacy.
19. The main problems of the coal mines are that in its initial stage up to independence, the mines were managed by the private entrepreneurs whose main objective was profit maximization the neglected the safety of the mines and people inhabiting near to the mines and development of infrastructural facilities. The mines remained under the fold of private management system even after the independence until 1973 when the Union Government made it nationalised. In this time also the mine owners followed the same techniques they followed in the past with less emphasis on renovation and modernisation of the mines. The policy of ‘extract as you can’ was the basis of coal mining in this period and miners were directed to drive deep in to the layers good quality at a cheaper cost. Wherever the depth of the mines increased with reciprocal hike in the cost of extraction, the owners abandoned the monies leaving enough workable quantity of coal. This has resulted in the problem of cost extraction of coal from the deeper beds of coal at the present. Production cost escalation has caused advanced retirement loss of jobs for a sizeable number of workers. Recently, the issue of the distribution ‘Coal Block’ to different agencies has created much conflicting debate in the Parliament which points towards huge economic loss from the Government side.

20. The problems related to the open cast mining operation are physical environmental and socio-economic and is directly related to deep change in land use pattern. The operations in open caste mines are mostly automated rightly from removing and relocating of earth and cutting, loading and transporting of coal, all performed with fuel powered heavy machineries. Opportunity of employment of local people is insignificant. The lands on which the open cast mines are established are the property of the ECL and are acquired from the local tenants through giving compensation, but the compensation with monetary terms doesn’t last long and the land on which produced crops become altered for ever either as water body or a derelict land. The open cast mines remove all elements from the surface including flora, fauna and even the water bodies and need dumping of earth materials it dug out reach the layers of coal. The problem then is physical environmental as well as economic and social in its kind.
21. But from the late 1980s, a number of industries started to suffer from financial loss due to various reasons. Some of the large nationalised industries were declared sick and sent to BIFR for consideration related to its future, and number of privately managed industries declared suspension of works, lay-off, closure etc. The problems implied in this context that they could not run their units due to increase in production cost, shortage in capital and simultaneous loss in the balance sheet. This has another dimension in this context that lies with the relation between the authority of the units and the workers’ unions affiliated to different trade unions. There is no way to deny that the aggressive trade unionism and labour unrest have a significant role in the decline in the state of the industries of the area. Environmental pollution is another problem related to a number of industries located in the area. The pollution of air and water by the newly emerged sponge iron industries need special mention in this regard. They adopt no pollution control measures in their units. Fumes and smoke coming out of their chimneys cover the surrounding areas of its location. The large campus of the defunct and abandoned industries makes inroads of unlawful activities of the miscreants. In reality, these lands have become threat to the civilians living nearby areas. In some cases these have now been the target of a class of unlawful promoting. Thus the problems related to the industries are essentially physical environmental, economic, social and political problems.

22. The main problems associated with agriculture are shrinkage and rapid reduction in areal extension due to acquiring of lands by the ECL, and failure of crops due to unavailability of needed quantity of water during the growth period of paddy. As surface water sources are dried up in the middle of the post-monsoon period and irrigation facility is absent, crop failure is resulted in agriculture.

23. The main problems of water resource in the study area are conservation and pollution, linked with abuse and overuse of this precious resource. There are tanks and ponds dotted over many parts of the area, but very few of whom can hold water in dry period. Surface water from rivers is used by the coal mines. Most of the surface water are percolated to the underground mine voids, and a substantive quantity of surface water is evaporated due to absence of vegetation cover on the soil. In case of underground water resource, maximum is extracted for mine operations and the
opencast mines also disturb the underground water table along with enhancing the rate of seepage from surface and acquires below the ground.

24. Gender gap is very prominent in literacy and in work participation. This gap connotes the problem of their social and economic status and empowerment. The domestic works are not the paid works and this workforce thus is not considered as worker. The gender gap is also related with the nutrition which is low among the women of the area due to unemployment of themselves as well as their male members. This has definite effect upon the stress and strain of the family members where gender discrimination in the form of domestic violence, wife biting and low status of the adult women and even the girl child.

25. Every problem has some solution which could be achieved through the cautious exploration of the prospects implicit in it. The most precious resources basic to the betterment of the life to the people of the area under review are the land inclusive of mineral resources beneath it, soil, water resource and obviously the human resource itself. The negative impact of mines and industries on those natural resources and on the people of the concerned area are perceptible, but magnitude and intensity of the problems varies in different parts of the area in connection with the differential dominance of the impacts. Planning for developing the area must consider those prospects.

The planning for sustainable development of resources, physical and human includes: (a) Integrated Mines Management, (b) Participatory Industrial Management and (c) Integrated Gender Development Program.

(a) The destruction of forests should immediately be checked and extensive reforestation program be taken. The voids of the underground mines be scientifically and properly filled in which will reduce the risk of subsidence, and minimise the damage to property and loss of life. As a part of the integrated mines development program, the state of the surface water bodies, including the rivers and water bodies be improved, for which the help of ‘100 Day’s Job’ through ‘Mahatma Gandhi National Rural Employment Guarantee Scheme’ may be sought for. The integrated approach will also include the urban housing areas, and should
frame policy against construction of multi-storied buildings on or near the mining sites. The integrated approach will also incorporate de-siltation and dredging of the choked and degraded courses of the streams and rivers to increase water carrying capacity and carrying out of effluents discharged from the mines and industries. Unauthorised mines may be leased out or to the local youths, or outsourcing through contracts.

(b) Both the Union and the State Governments should take initiatives to run the non-profiting industries and at least the people already employed can earn to support their lives as they are the people of the region as well as the of the nation. Rural –Urban Connectivity should be improved for the sake of the development of the industries and tertiary sector where sizeable number of workers may be absorbed, and pressure on the industries may be reduced. Land for industrial hub or estate be developed for small and medium scale industries. The Mangalpur Industrial Estate at Raniganj and the Kalyanpur Industrial Estate at Asansol are proposed to be developed to accommodate the industries of new horizon, where educated and skilled professionals may be employed. Support from both the Union and the State Governments to the trailing industries of the area is necessary to save jobs. A cut in real wages of the workers is also a way to help reduce the problem of unemployment.

(c) The Union and State Governments together should make schemes with equal responsibility and considering the needs of the local women. Before implementation of the scheme, all women should be made aware about the details of the program. Integration of all participants like, government officials preferably women, Panchayet representatives in rural parts or Councilors in case of urban areas, local representatives from all political parties or trade unions are necessary for implementation of the program. The employees or the co-workers should give a serious thought in the matter for equal remuneration for equal work and wipe out the discrimination in the matter of payment of remuneration to women. The norms of equal remuneration for same job should be readily followed. The gender gap at all levels of education should be removed. The need for improvement in the education and training should be emphasised and be provided to both the male and female youths with a greater focus on development of vocational skills and self employment. The women in the health-care, hospitality, education and industries are less likely to report wage discrimination compared to those in manufacturing, retail and professional and business services. They should be helped to report the reality. Equal access to participation and decision making by women in social, political and economic life of the people of the area be ensured. Equal
access to health care, quality education at all levels, career and vocational guidance, employment, occupational health and safety and social security to women be ensured. The children of all the families must be given initiatives to complete their school education. Mainstreaming of gender perspective, elimination of discrimination, eradication of all forms of violence against women and the girl child should be given importance in the integrated gender development process.

Most important of these are the land, soil, and water and the mines and industries can be optimally used and suitably managed with provision of sustainable development. There are prospects of implementation of cooperative systems of production from mines and industries, pollution free new industrial set up, provision of use of water bodies free of contaminants, provision of agriculture with implementation of small irrigation system etc. These will provide prospects of employment and economic development.

Summarising all the discussion, it may be concluded that both underground and open cast coal mining activities and closure of mines and industries of the area under review have affected the environment and economy of the human community in general and the women in particular, but the effects are not equal in extent and magnitude. Some groups of people suffer more than the others who are away from the most effected parts. The people living close to the mines and more dependent upon mines and industries for sustenance are more affected by negative impacts of mines and industries and need social justice. The question of differential sufferings needs amicable solutions which they may achieve through the plans which include their needs. Being predominantly an urban industrial area, both the people living in and outside the areas affected need suitable plan to achieve a balanced development of the area. Active participation in the development program by the local people from every stratum of the society is necessary.