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Ecological study of malaria disease in south 24 Parganas district of West Bengal

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Abstract
Man, mosquito and malaria parasite co-existed in Ganga Delta of West Bengal from ancient times. As a matter of fact, before the introduction of National Malaria Control Programme, malaria dominated the morbidity scenario in South 24 Parganas district. The main objective of this study is to know the spatial distribution and epidemiology of malaria disease in the area under study. The district South 24 Parganas is situated at the southern tip of West Bengal. Both primary and secondary have been collected for this study. The humid tropical climate with a heavy rainfall during the monsoon months forms an ideal environment for proliferation of mosquitoes. The common parasites found in this district are *Plasmodium vivax* and to a lesser extent of *Plasmodium falciparum*. Anopheles mosquitoes are the carriers of these parasites in this district. Cultural factors like level of living, housing condition, sewerage system income, rearing of animals, clothing etc. play a very significant role to spread of such vector borne disease in this district. Most of the people are not aware about the breeding place of mosquitoes. In this district morbidity of malaria is higher than other vector-borne diseases. Among five Subdivisions of this district, number of cases, Death Rate and Case Fatality Rate are more in Canning Subdivision. After that the Government of India has undertaken measures to eradicate malaria through National Malaria Control Programme, Malaria Eradication Programme and National Vector-borne Disease Control Programme.

Keywords: national malaria control programme, ecology, proliferation, morbidity

1. Introduction
Disease may be defined as the bio-physiological phenomena of the human body. From a sociological point of view disease is considered social phenomena, occurring in all societies and fought in terms of the particular cultural forces prevalent in the society (Park, 2005) [8]. Parameters like frequency, distribution, mortality and seasonal out break etc. all have been taken in this present research work for preparation of disease profile. The word 'malaria' has come out from Italian word 'mal *aria*' which means 'bad air'. There is a second opinion that it came from the Latin word *'palus'* which means swamp (Hati, 1991) [3]. Malaria is a vector-borne disease. Malaria parasite plasmodium is prevalent in the study area. The district South 24 Parganas is situated at the southern tip of West Bengal. It comprises of 29 C.D. Blocks, five subdivisions and seven municipalities. The main objective of this paper is to know the morbidity and mortality rate of malaria disease and to emphasize on its various controlling methods. After collection of primary and secondary data from various sources, both sets of data have been computed for cartographic presentation. Number of cases, death rate and case fatality rate are more in Canning subdivision than other four subdivisions. After eighth World Health Assembly on May 1955, Government of India has taken initiative to eradicate malaria through National Malaria control Programme, National Vector Borne Disease Control Programme etc.

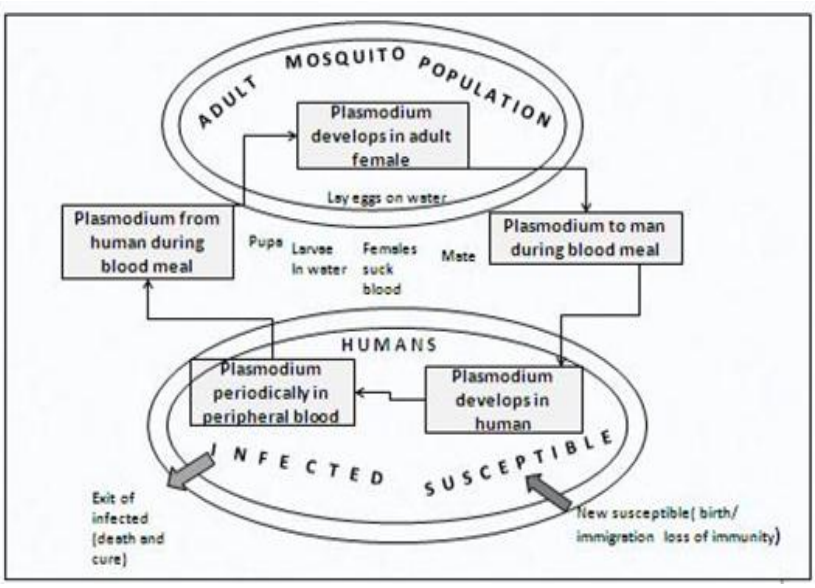
2. Statement of the Problem
The area under study is situated in the lower deltaic region of the river Ganga. There are so many wetlands, rivers, ponds and paddy fields. These are the ideal places for proliferation of malaria vectors. Most of the people in the district are farmers. During rainy season they go to the paddy field for earning livelihood. But they do not wear mosquito proof clothes. Monsoon and retreating monsoon season are the ideal periods for breeding of mosquitoes. This disease spreads from one infected person to another person by mosquito. Anopheles mosquitoes are the carrier of malaria parasite *plasmodium.* People in the rural areas of the district do not take proper initiative to prevent malaria disease. Even, they do not use mosquito nets at night. In the urban areas of the district, there are so many garbage vats, small pools, and water reservoirs around the construction sites. Grass root people are ignorant about basic health and personal hygiene. Though Government of India has taken initiative to eradicate this disease through various programmes, but the concerned State Government is not able to properly implement these programmes.

3. Materials and Methods
Both primary and secondary data have been collected for this study. Primary data have been generated through questionnaire survey based on random sampling method. Sample data have collected from both rural and urban area of the district. Secondary data have been collected from various government and non-government sources. At last both primary and secondary data have been computed for cartographic presentation followed by interpretation.

4. Results and Discussion
Some findings have come out from this endeavour. These have been mentioned here under the different sub heads.

4.1 Interlocking Life Cycle of Malaria
Malaria is an anthropoid transmitted fever. Malaria parasite,

Plasmodium was discovered by Ronald Ross. While working at Secundrabad in Andhra Pradesh and later at Calcutta, he proved that *Plasmodium* passed from one victim to another through the bite of mosquitoes. It is a disease involving three different organisms. *Plasmodium* is the causative agent, mosquito is the vector and man is the host. The disease is caused by the bite of female anopheles mosquito and not by the male of this species or by any other species of mosquito (Misra, 2007) [7].



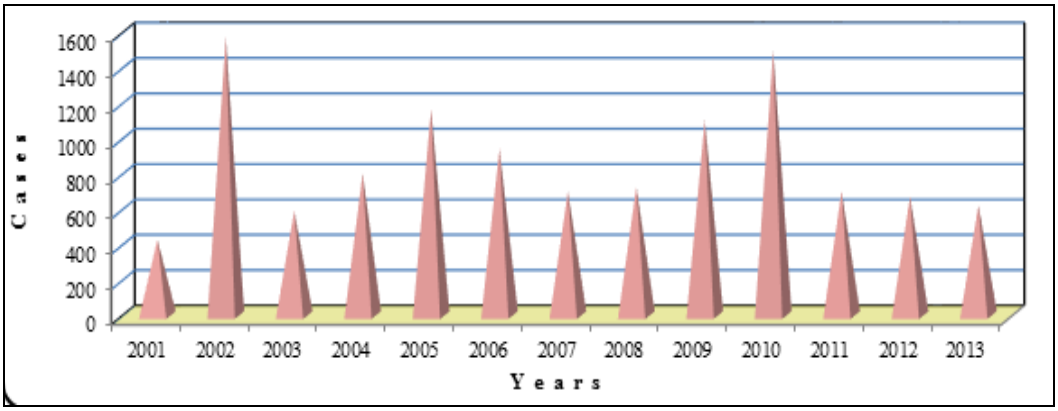
Source: Learmonth, 1978

Fig 1: Malaria Disease cycle

Anopheles mosquitoes are indeed alternate hosts of the protozoal parasite. Both man and mosquito are essential to maintenance of the malaria cycle. Malaria parasite *Plasmodium* develops in adult female mosquito. They lay eggs on water. Then this parasite is transmitted to human body during their blood meal. Then this parasite develops in human body. During this time another female anopheles mosquito can bite them; and sometimes they give birth to new vector. On the other hand, sometimes they exit from infected person. After an infected mosquito bite a non-infected person, then malaria parasite transfers from one person to another. Thus interlocking life cycle of malaria is formed.

4.2 Incidences and Distribution

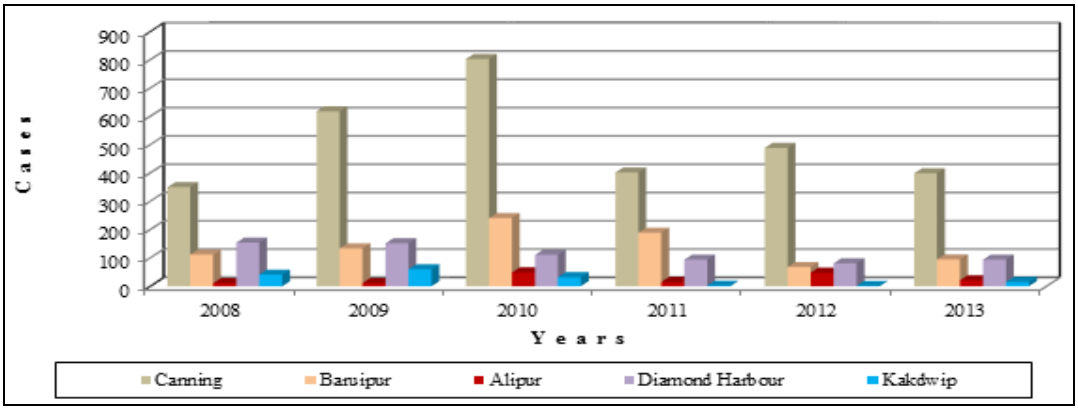
Incidences is a word applicable for the person suffering from any kind of disease i.e. psychologically, physically, mentally or biologically. Thus all kind of patients medically ill is known as Incidence (Kathuria, 2012) [4]. Government of India has launched various programmes to prevent this disease. But reported cases of malaria are observed in the district in each and every year. In the area under study, incidences of malaria were high in the year of 2002 and 2010. Figure no. - 2 show that from 2001 to 2013, when the number of cases were high, then the Government has taken necessary initiatives. As a result number of incidences had reduced.



Source: CMOH, South 24 Parganas

Fig 2: Year wise Fluctucation of Maleria 2001-2013

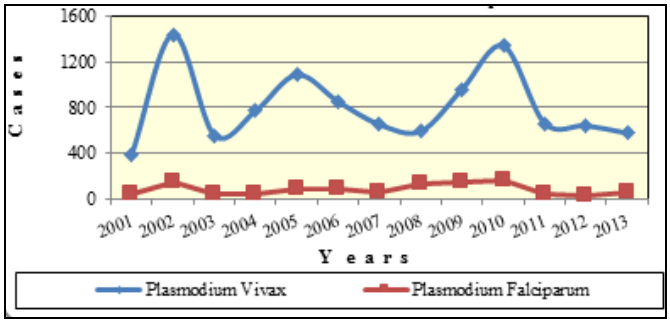
And then in next two or three years number of cases remained low. At that time allotted fund for this vector borne disease was either unutilized or diverted to any other programme. Then again number of incidences has increased because of poor administrative response.



Source: CMOH, South 24 Parganas

Fig 3: Subdivision wise Annual Variation of Malaria cases

Malaria has spread over five subdivisions in the district. But maximum number of incidences has been observed in Canning subdivision. Outbreak of malaria cases was lower in Kakdwip and Alipur subdivisions (Fig. 3).



Source: *CMOH, South 24 Parganas Plasmodium vivax*

Fig 4: Distribution of Maleria species

4.3 Dominant Species of Malaria Parasite

The malaria parasites have four distinct species: a) *Plasmodium vivax*, b) *Plasmodium falciparum* c) *Plasmodium malariae* and d) *Plasmodium ovale. Plasmodium vivax* is the most wide spread malarial infection in the world. In India, about 60 per cent of the infections are due to *Data.* It is benign infection and rarely produces serious complications or death. *Plasmodium falciparum* is also widely distributed claiming about 40 per cent of the infections. *Plasmodium malariae* is restricted to only a few pockets. *Plasmodium ovale* is a rare parasite as far as human are concerned (Misra, 2007) [7]. But in the district concerned, there are two types of malaria parasites species. These are *Plasmodium vivax* and *Plasmodium falciparum.* In figure no.-4, it may be observed that out of total malaria cases, disease

4.4 Mortality Scenario

Malaria held the pride of position as killer as well as cause of morbidity in West Bengal. But after implementation of various malaria control

Table 1: Year-wise cases and deaths of malaria in West Bengal prior to implementation of Malaria Control Programme

Years	Cases	Number of Deaths
1947	2,032,524	82,529
1948	2,123,233	76,576
1949	1,802,150	77,406
1950	1,418,713	57,937
1951	1,596,839	36,294

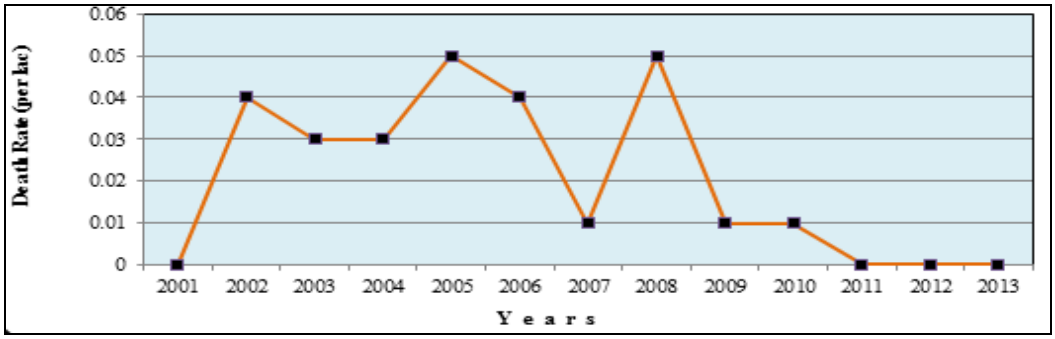
Source: Basu Mallick, 1986

Caused by *Plasmodium vivax* species is high in the study area. Programme, number of deaths has come down. There is no doubt that a benefit had been gained by the people of this State as a result of Malaria Eradication Programme (Basu Mallick, 1986) [1].

Table 2: Year-wise cases and deaths of malaria in West Bengal after implementation of Malaria Control Programme

Years	Cases	Number of Deaths
1978	11,850	1
1979	11,509	1
1980	22,249	4
2012	55,793	30

Source: Basu Mallick, 1986



Source: CMOH, South 24 Parganas

Fig 5: Year wise Fluctuation of Death Rate out of Maleria

Death rate of malaria has been reduced over time in the district. In figure no- 5 it may be observed that death rate of malaria was high in 2005 and 2008. From 2011 to 2013, death rate of malaria was nil in the district. Out of the five subdivisions in the district, death rate per lac population was noticeable only in Canning and Baruipur subdivisions.

Source: *CMOH, South 24 Parganas*

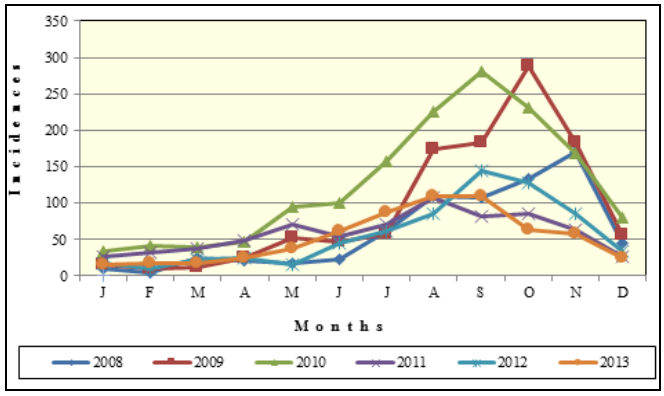
Fig 6: Case fatality Rate out of Maleria

4.5 Case Fatality Rate

Case Fatality Rate represents the killing power of a disease. It is simply the ratio of deaths to cases (Park, 2005) [8]. Case Fatality Rate of malaria was high in South 24 Parganas district during 2007 and 2008. After 2008 Case Fatality Rate of malaria has been reduced because of Government initiative and mass awareness about malaria. In the study area, there are four pertinent types of vector borne diseases like malaria, dengue, chikunguniya and kala-azar. Case Fatality Rate of malaria was higher than other vector bone diseases; and Case Fatality Rate of chikunguniya was nil in the district.

4.6 Seasonal Outbreak

Malaria is a vector borne disease. Female anopheles mosquitoes are the carriers of malaria parasite. It is a seasonal disease and most common in monsoon and retreating monsoon season (Misra, 2007) [7].Because during this season, water is accumulated in ponds, low lying lands, swamps and paddy fields which offer good conditions for breeding of mosquito.



Source: CMOH, South 24 Parganas

Fig 7: Monthly break of Malariya Incidences

From the present study, it is evident that, outbreak of malaria was high from the months extending from July to November and number of cases is low in rest of the months in the calendar year.

4.7 Prevention and Control of Malaria

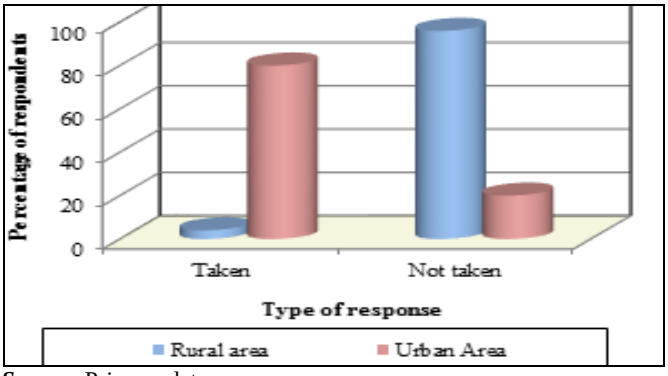
Malaria being the greatest killer of mankind the necessity of control measures was felt in all the malaria endemic areas of the world (Saha, 2012) [9].

4.7.1 Actions taken to destroy Malaria Vecto*r*

Through personal interaction it has been revealed that in the rural areas of the district, local authority does not take necessary steps to control this disease. But in the urban areas, the concerned municipalities as well as more aware group of people take necessary steps to prevent this disease. Most of the time, they spread bleaching powder in and around households. Sometimes, to destroy mosquito larvae, they remove the pot holes, clear water hyacinth of the small ponds and slash the unwanted weeds from the edges of canals and roads.

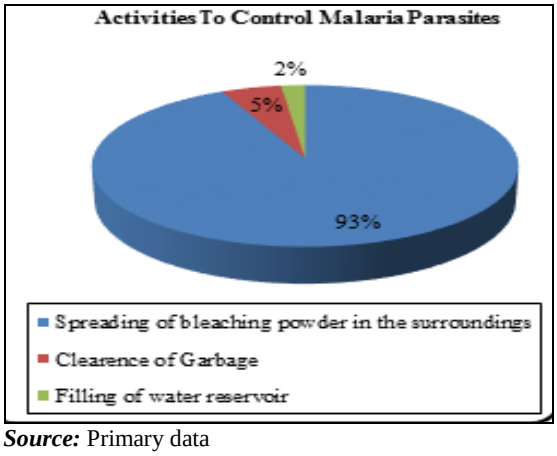
4.7.2 Mass awareness about malaria

Awareness of the local people has been enhanced



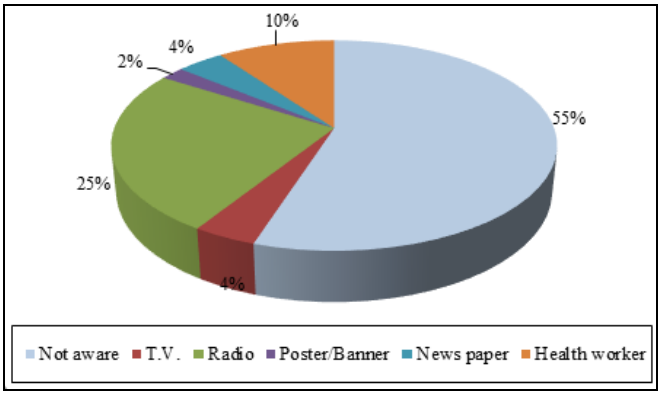
Source: Primary data

Fig 8: Step to control Vector borne disease



Source: Primary data

Fig 9: Activities to control Malaria parasites



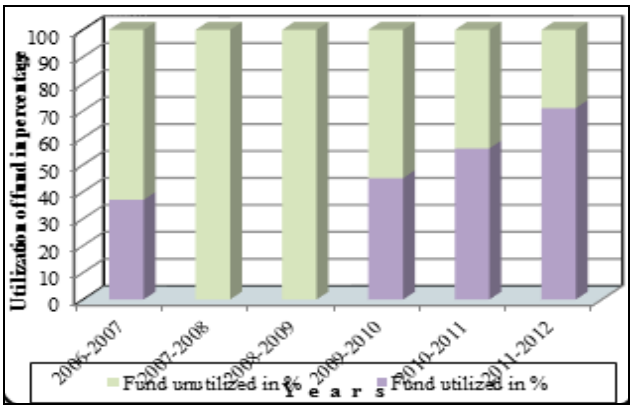
Source: CMOH, South 24 Parganas

Fig 10: Different source of Information

Through Television, Radio, Newspaper, NGOs, and Health Worker etc. But most of the rural people are not aware about the preventive measures of malaria. They are not conscious about the breeding places of mosquitoes. Even most of them do not use mosquito nets or repellent at night and do not even wear mosquito proof clothes.

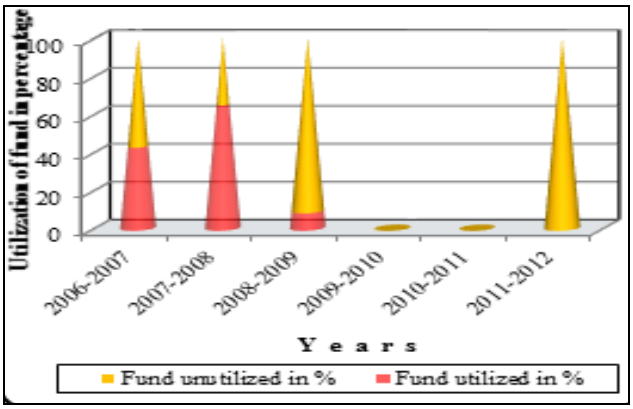
4.8 Utilization of Funds for Malaria Control Programme

To reduce malaria disease, Government of India has launched various programmes. After Independence, National Anti Malaria Programme was centrally sponsored by National Health Programme. The programme was started in 1953 as National Malaria Control Programme and this was converted to National Malaria Eradication Programme in 1958 (Govt. of India, 10). In 1977, Modified plan of operation was launched with the immediate objectives to prevent deaths and reduce morbidity due to malaria (Taneza, 2010) [10]. National Vector Borne Disease Control Programme (NVBDCP) was introduced in 2003-04 by convergence of three ongoing prograames on malaria, filaria and kala-azar. The National Health Policy (2002) has set the goal of reduction in mortality out of malaria by 50 percent by 2010 and to take efficient morbidity control



Source: CMOH South 24 Parganas

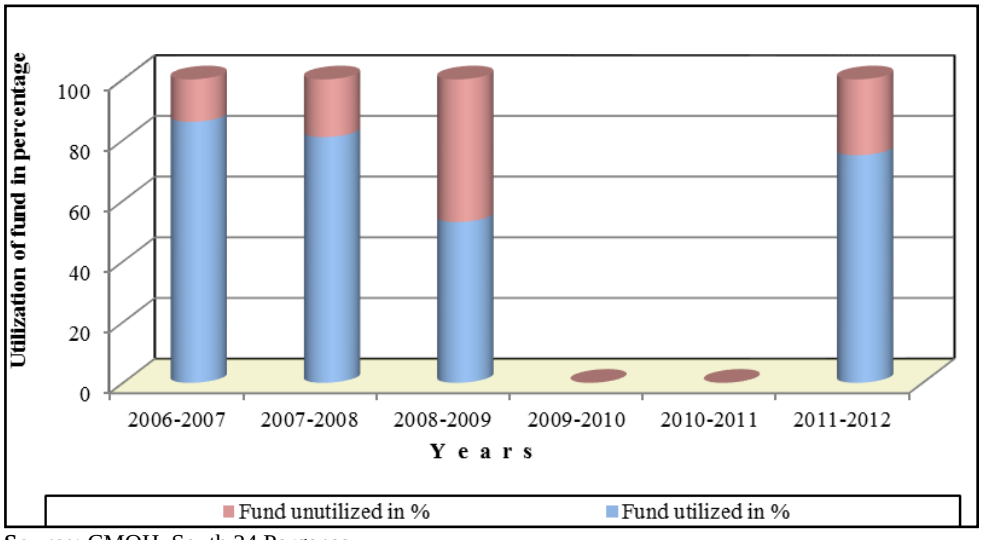
Fig 11: National Vector Borne Disease Control Programme



Source: CMOH South 24 Parganas

Fig 12: DDT spray Programme

Measures. In this study, it has been observed that fund released under National Vector Borne Disease Control Programme was not fully utilized in several financial years. During the year 2007-08 and 2008-2009, total fund was unutilized. Sometimes these funds go back to the Government finance department and otherwise it is diverted to another programme.



Source: CMOH, South 24 Parganas

Fig 13: Night Blood Collection Programme

So it is evident that allotted fund was not properly utilized in several instances. Fund granted for DDT spray was not fully utilized in 2011-2012. But most of the allotted fund for various malaria control programme was utilized in the urban area of the district during the same period. Fund allotted for Night Blood Collection were fully spent during the years of 2006-07 to 2011-12. Malaria will remain endemic in many parts of India in the twenty- first century, but the prospects are good for steady improvement in control (Kiple, 1993) [5].

5. Conclusion and Recommendations

Malaria may spread over a vast area in water logged and unhygienic conditions. Mass awareness can reduce number of the malaria affected person in the district. Fund allotted for the purpose should be utilized fully for malaria control without any fund diversion. Recently the Government of India has taken initiative to eradicate malaria disease through Night Blood Collection, DDT spray and Anti Malaria Programme. In fact there is no dearth of fund. Awareness of the common people with community will force supported by prompt administrative response to optimize the fund available for targeted areas are the most affective safety valves for control of this vector borne disease.

Some recommendations may be put forward at the end of entire exercise. These are; regular campaign regarding health concern has to be organized by different Government and Non-Government Organizations. There is needed to make the local people conscious about breeding places of malaria vector. Awareness about vector borne diseases will have to be enhanced among the local people. Health related campaign should be held at different times in schools and local level. Government should make provisions for drainage of the low lying areas especially the swamps and low lying areas. Local authority should take initiative to excavate drainage lines on a small scale around the villages and in the compounds of the houses. People should maintain irrigation channels properly and slash the unwanted weeds surroundings the households. They should wear mosquito proof clothes and use repellent, mosquito nets etc. at night.

6. References

1. Basu Mallick. A Profile of Health and Disease of West Bengal, Published by Srikanta Basu Mallick, Kolkata. 1986; 17:20-27.
2. Government of India: Health Schemes and Grants, Indian Institute of Training and Development, West Bengal. 2002, 10.
3. Hati AK. Malaria, West Bengal State Book Board, Kolkata. 1991, 1.
4. Kathuria Renu. Medical Geography, RBSA Publishers, Jaipur, 2012, 89.
5. Kiple F, Kenneth. The Cambridge World History of Human Diseases, Oxford University Press, London. 1993, 862.
6. Learmonth, Andrew: Pattern of disease and Hunger, David and Charles London. 1978, 56-57.
7. Misra RP. Geography of Health: A Treatise on Geography of Life and Death in India, Concept Publishing Company, New Delhi. 2007, 231-233.
8. Park K. Preventive and Social Medicine, Banarsdas Bhanot, Jabalpur. 2005, 29:52.
9. Saha B. An Essential Guide to Hygiene, Paul Medico, Kolkata. 2012, 105.
10. Taneza DK. Health Policies and Programmes in India, Indian Public Health Association, Delhi. 2010, 179-180.