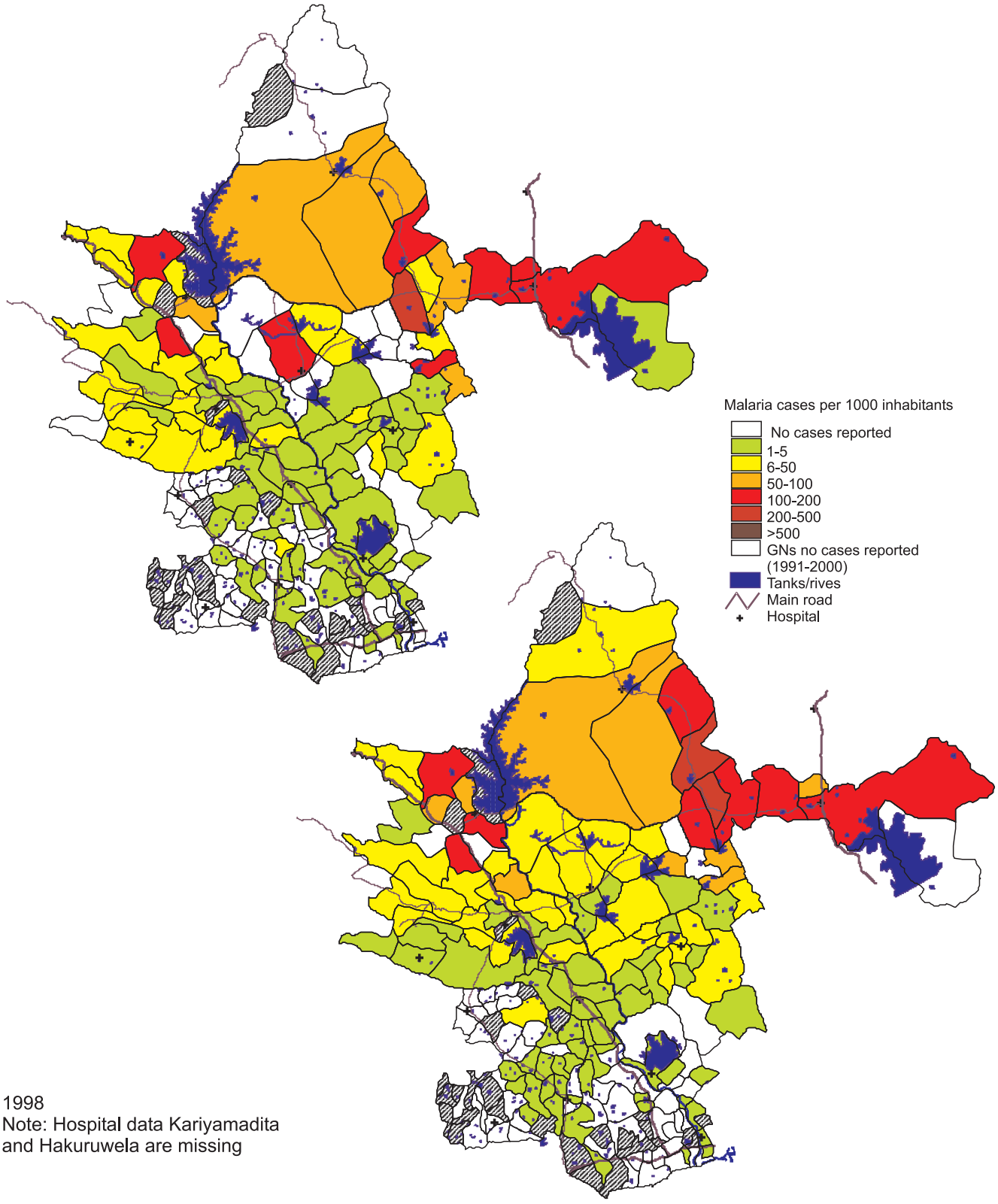
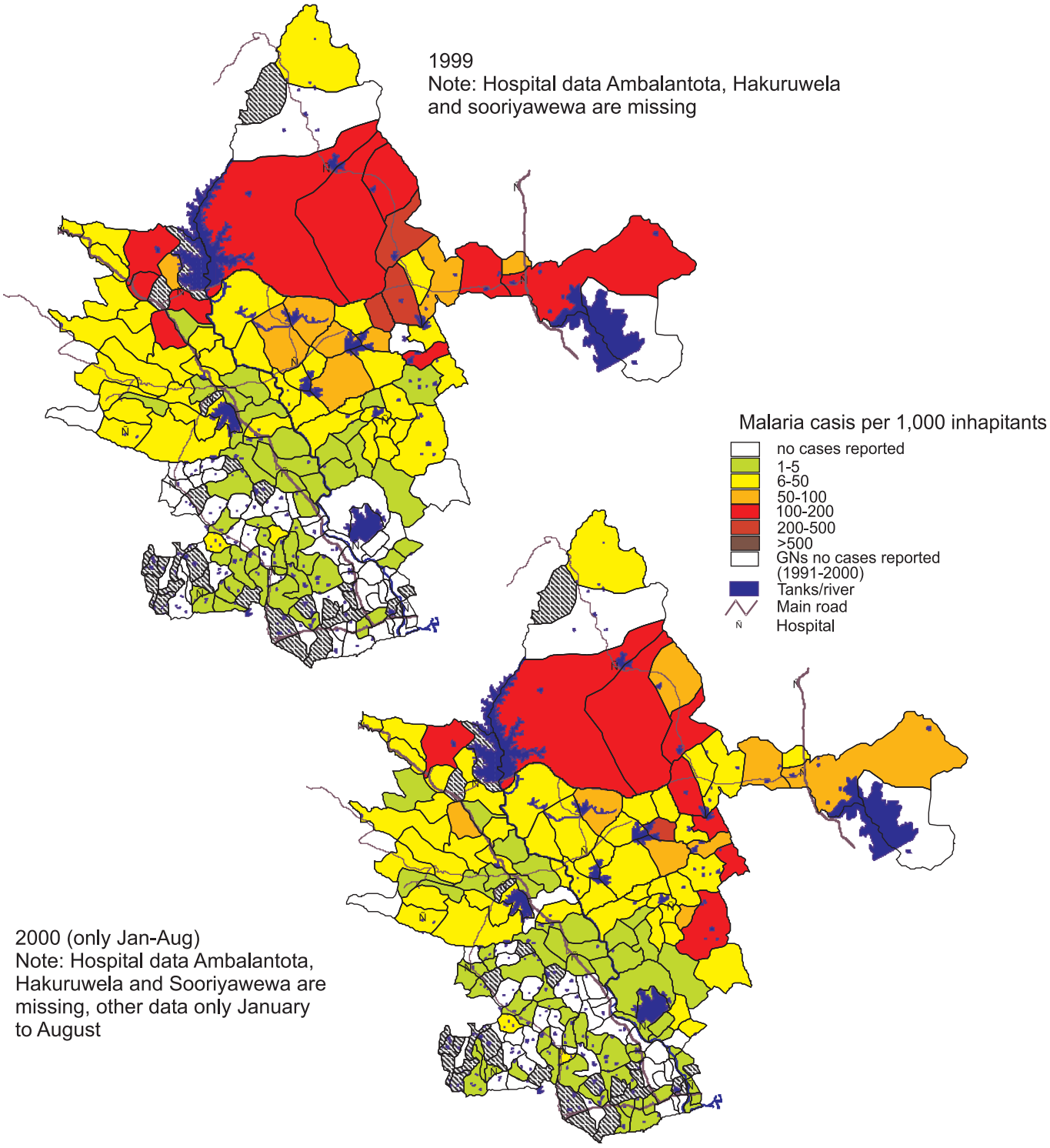
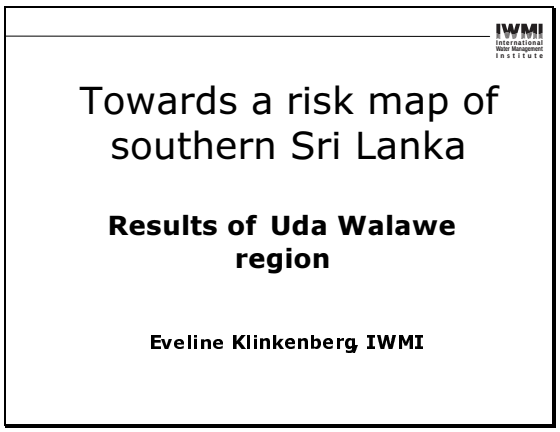
1997
Note: Hospital data Kariyamadita and Hakuruwela are missing



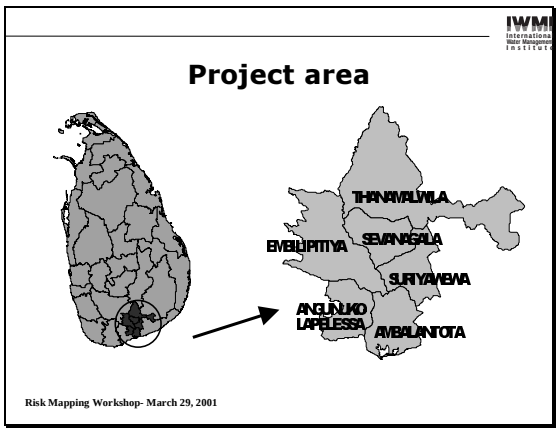
1998
Note: Hospital data Kariyamadita and Hakuruwela are missing


1999
Note: Hospital data Ambalantota, Hakuruwela and sooriyawewa are missing
Malaria casis per 1,000 inhapitants
no cases reported
1-5
6-50
50-100
100-200
200-500
>500
GNs no cases reported (1991-2000)
Tanks/river
Main road
Hospital
2000 (only Jan-Aug)
Note: Hospital data Ambalantota, Hakuruwela and Sooriyawewa are missing, other data only January to August

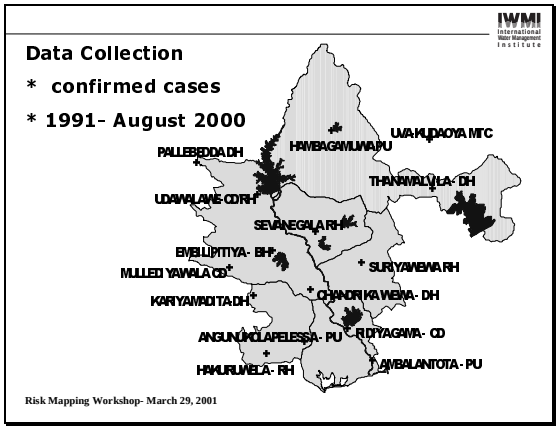
Powerpoint slides of presentation:



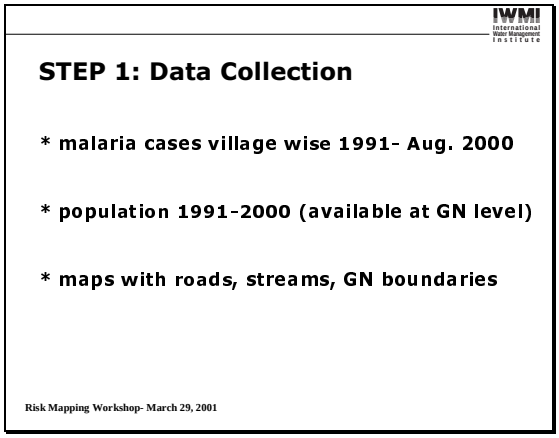
Slide 1



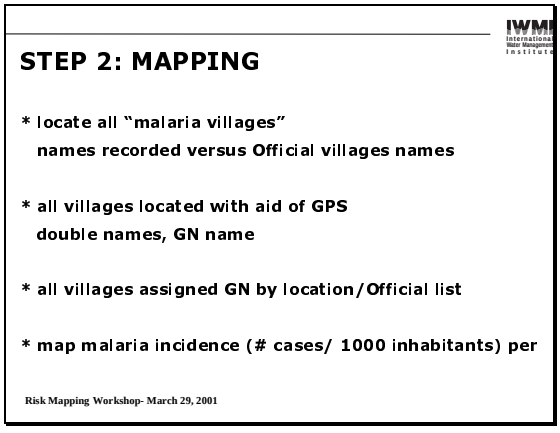
Slide 2



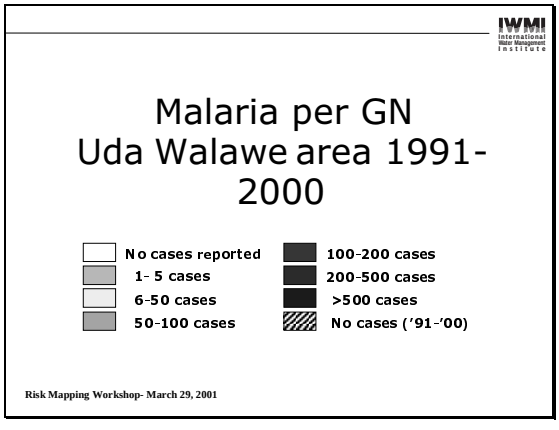
Slide 3



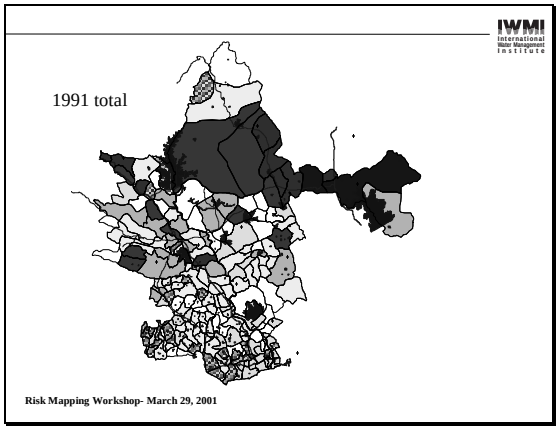
Slide 4



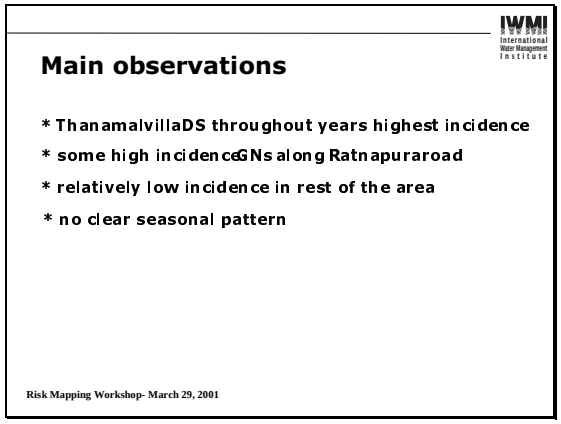
Slide 5



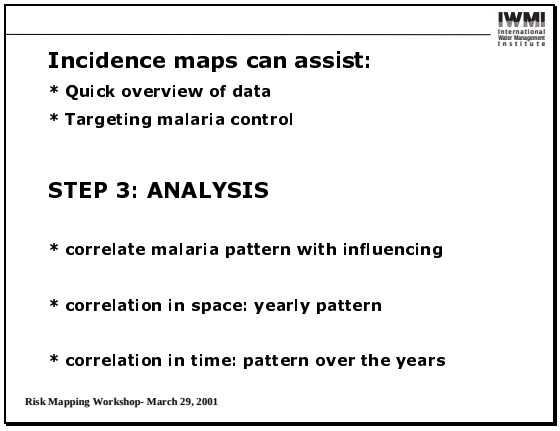
Slide 6



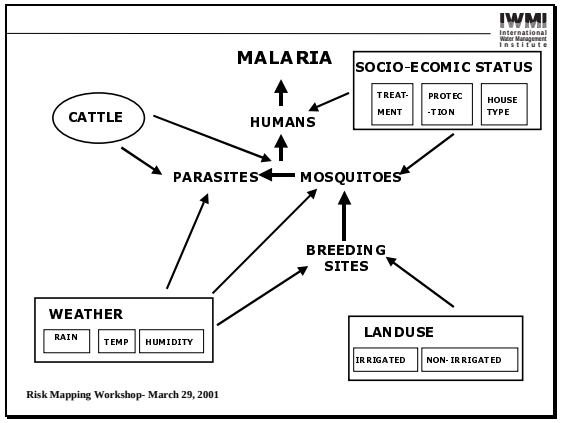
Slides 7 16: Total yearly malaria incidence data 1991-2000, see figure 3.



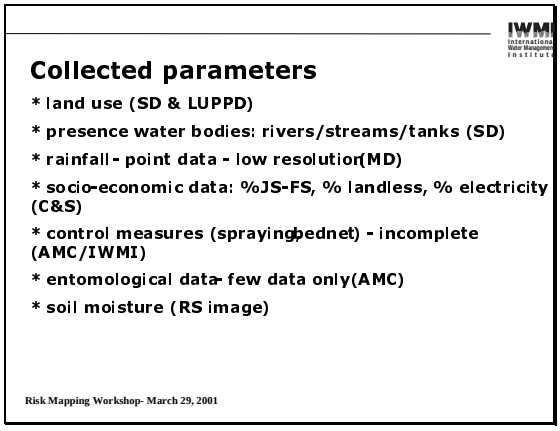
Slide 17



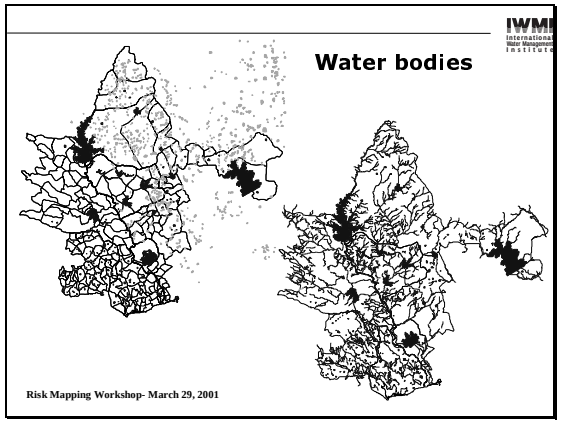
Slide 18



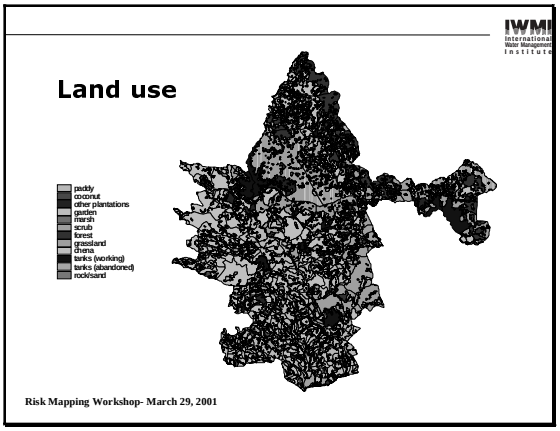
Slide 19



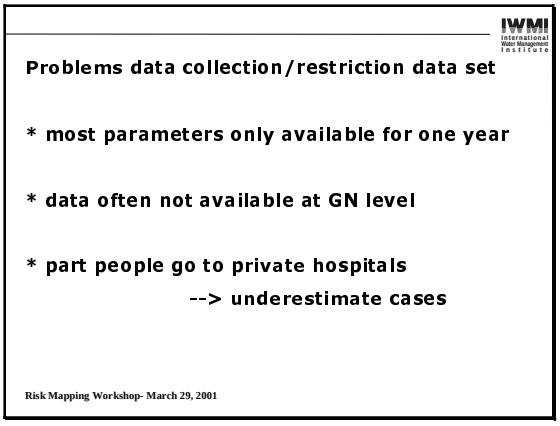
Slide 20



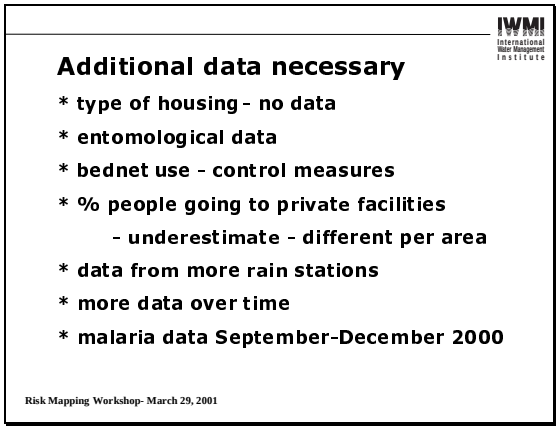
Slide 21



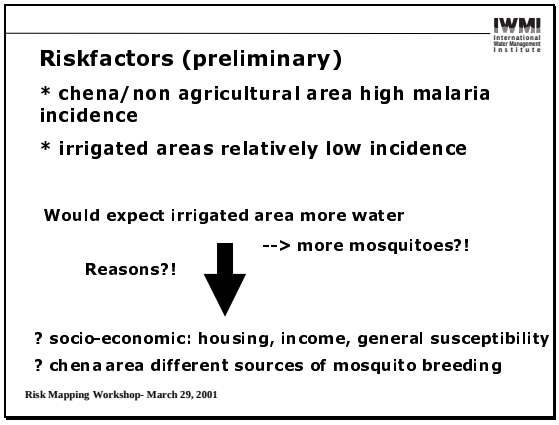
Slide 22



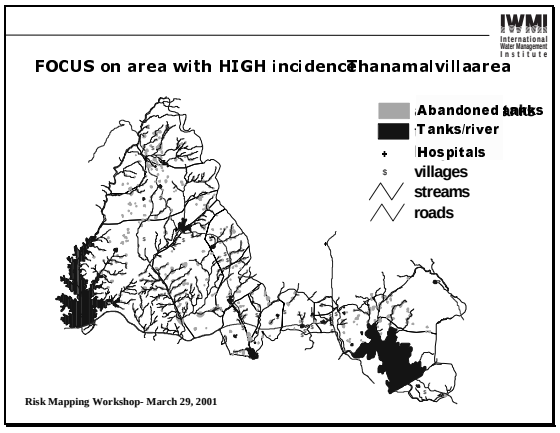
Slide 23



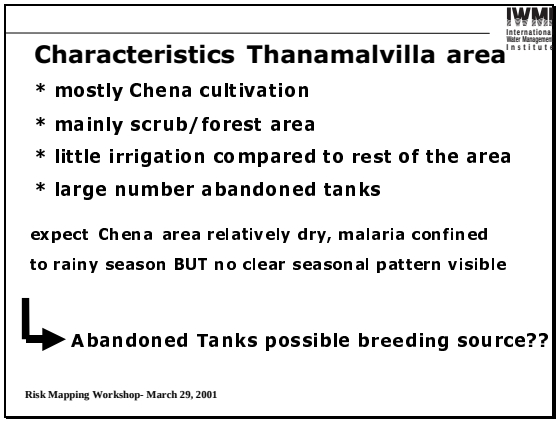
Slide 24



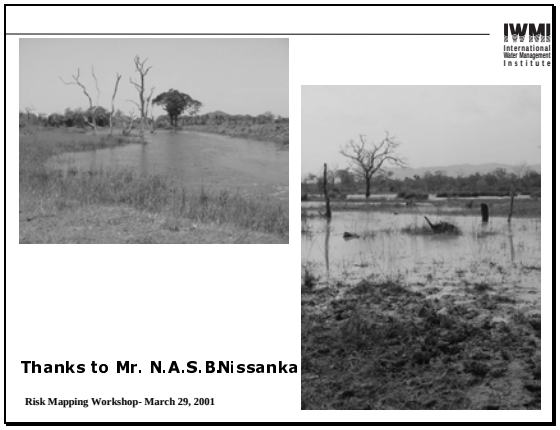
Slide 25



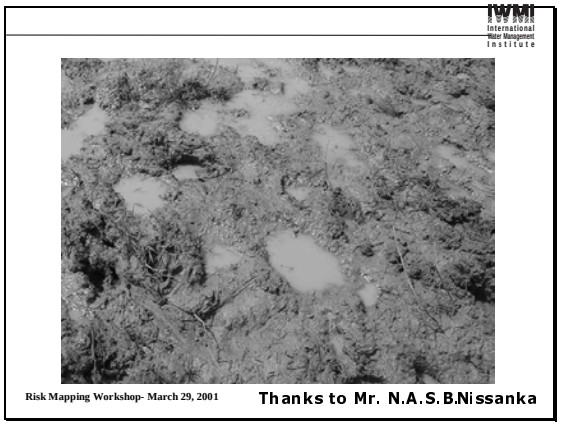
Slide 26



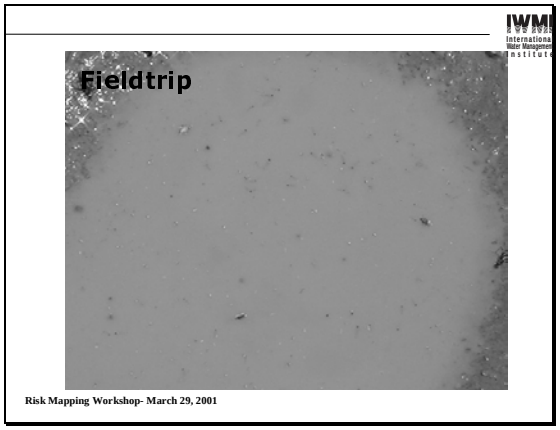
Slide 27



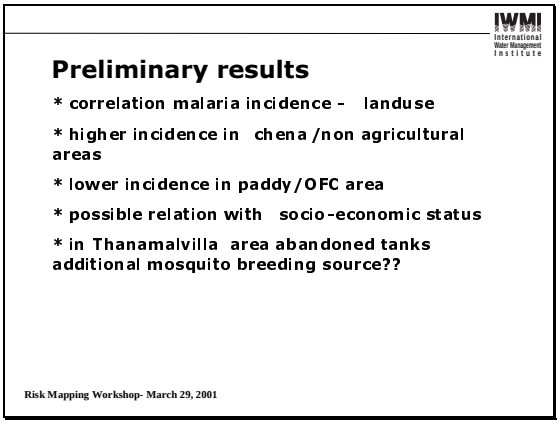
Slide 22



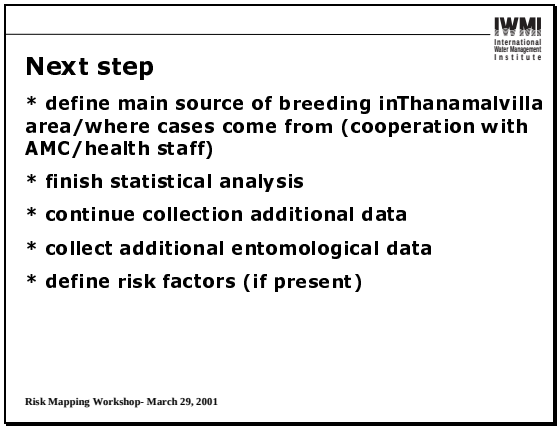
Slide 22



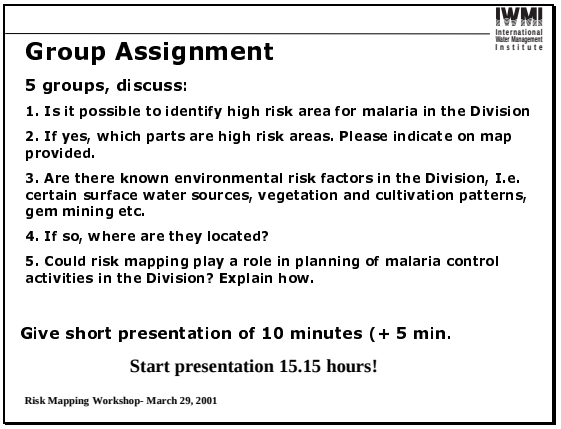
Slide 22



Slide 22



Slide 22



Slide 22

5. SUMMARY OF PRESENTATIONS

The groups addressed the following questions:

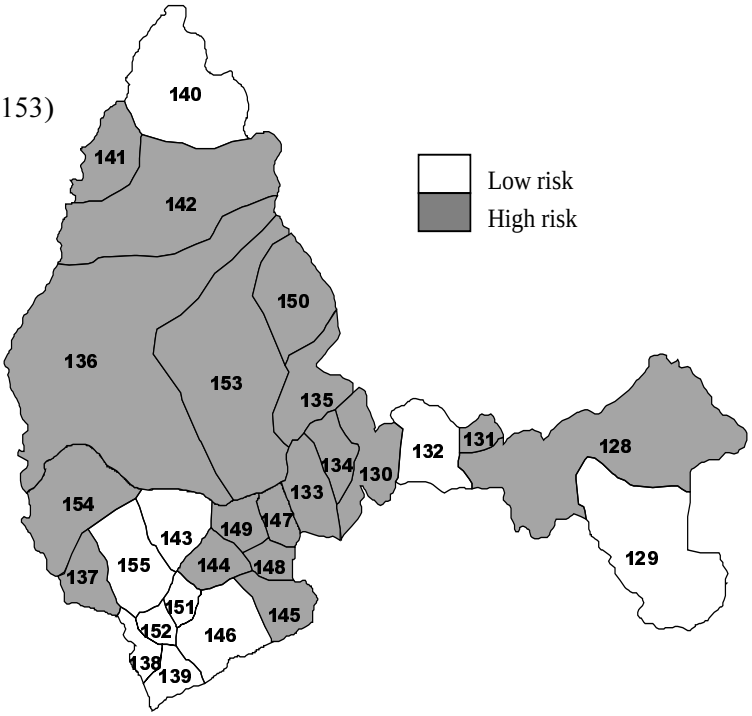
1. Is it possible to identify high risk areas for malaria in the Division?
2. If yes, which are the high risk areas? [Please indicate on map provided.]
3. Are there known environmental risk factors in the Division, i.e. certain surface water sources, vegetation and cultivation patterns, gem mining, etc. Where are they located?
4. Could risk mapping play a role in planning of malaria control activities in the Division? Explain how.

Presentation: Thanamalvilla-Sevenagala DSD
By Mr. H. M. Faizal, RMO Moneragala District

High risk areas:

There are 27 GN areas in these two DSDs of which 16 are high risk areas. This information was based on the personal knowledge of the participants present. The high risk GNs were:

- Hambagamuwa (136)
- Aluthwewa (142)
- Hambagamuwa Colony (J.P.) (153)
- Kahukurullan Pelessa (150)
- Kotavehera manakada (141)
- Mahawewa (135)
- Kivulara (131)
- Suriara (133)
- Weliara (147)
- Habaraluwewa (143)
- Samagaipura (149)
- Nugegalayaya (145)
- Thanamalvilla (128)
- Katupilagama (154)
- Kiriibanwewa (144)
- Punchiwewa (148)



The response to the question why the three GNs in the Thanamalvilla DSD were classified as low risk was:

- Kandiyapitawewa (140) belonged to the Balangoda area and since it was mountainous and forested there were less cases in that area.
- Sinukkuwa (129) is an area with few people and few houses and, as such hardly any cases are recorded.
- Bodagama (132) is a town area, and does not have many cases of malaria.

Environmental risk factors for the Thanamalvilla area:

1. A number of slow moving streams provide breeding sites for the vector. Rivers flowing through the area are: Kirindi Oya, Mal Ara, Mau Ara, Mulakandu Ara, Habaraluam
2. Abandoned tanks could serve as breeding sites, as shown in the presentation by Ms. Klinkenberg. However the importance of these abandoned tanks needs to be confirmed with additional entomological surveys.
3. Irrigation canals and channels which are not lined provide breeding sites.
4. *Chena* (slash and burn) cultivation: mostly illegal, e.g. ganja (cannabis) cultivation. This cultivation takes place deep in the jungle and these areas cannot be easily accessed because of animal and gun traps. Most *chena* cultivators are migrants who live in the border areas of Hambantota and Embilipitiya. As such, people movement also has a bearing on the number of malaria cases reported.
5. Poor socio-economic status of the people in the area. Farmers' incomes are not very high and house construction is, in general, very poor.
6. Long planned irrigation projects. Some projects have been planned for four to five years and implementation takes a long time. For instance the Mau Ara project took a long time for development. During the period of construction breeding sites are formed in the channels and areas under construction and therefore the length of time taken for the construction phase poses a malaria risk on the area.

Risk areas:

1. Chena cultivation areas. Chena cultivation takes place in most areas of the Thanamalvilla DSD. The main areas are: Kahukuranpelessa (150), Aluthwewa (142), Hambagamuwa Colony (153), Kotavehera manakada (141), Mahawewa (135), Kivulara (131), Suriara (133), Weliara (147), Nugegalayaya (145), Punchiwewa (148)
2. Abandoned tanks and slow moving streams. These are present throughout the area.
3. Irrigation projects: e.g. Udu Mauara (143), Suriara (133)

Role of risk mapping:

1. The types of breeding sources could be identified and larval control could be scheduled easily and in advance and thereby saving on the resources such as Abate (chemical larviciding).
2. To design and undertake large residual spraying activities in a proper manner since it allows identifying areas from where the vectors come.
3. The establishment of treatment centers and operation of mobile clinics in areas from where cases are reported. Thus introducing control activities in time instead of being late, as often is the case now, when they can only start the control after an outbreak is reported.
4. Since epidemics could be forecasted – be alert and prepared.
5. Mobilize entomological teams to visit the high risk areas.
6. Organize mass blood survey programs
7. Assist in planning of the control programs.
8. Targeting of high risk areas at an early stage.

A question raised by the Thanamalvilla group was "How early could a malaria epidemic be forecasted with risk mapping?"

Dr. Felix Amerasinghe replied that epidemic forecasting and basic risk mapping of cases are two different things that should be clearly distinguished:

1. Basic risk mapping was the mapping of malaria data on a map. This could be done as soon as the malaria case data was available. For each area it takes some time to build the basic data set but once this is done, every month/week a new map could be generated, showing malaria incidence at GN (or at any other requested) level. Reading such maps would allow for control work to be introduced to the areas with high risk and high malaria incidence.

2. Epidemic forecasting was the prediction of impending epidemics. This could only be done if clear indicators were found which would allow for the prediction of areas where and the times when epidemics are prone to arise. This was not the case yet in Sri Lanka. What is being done now is the analysis of the influence that different parameters e.g. land use, rainfall, socio-economic data etc. have on malaria incidence. With this analysis a first step could be taken in the development of a model to predict impending epidemics. The type of risk factors defined and the possibility to extract these risk factors from satellite data would determine how early a prediction could be made.

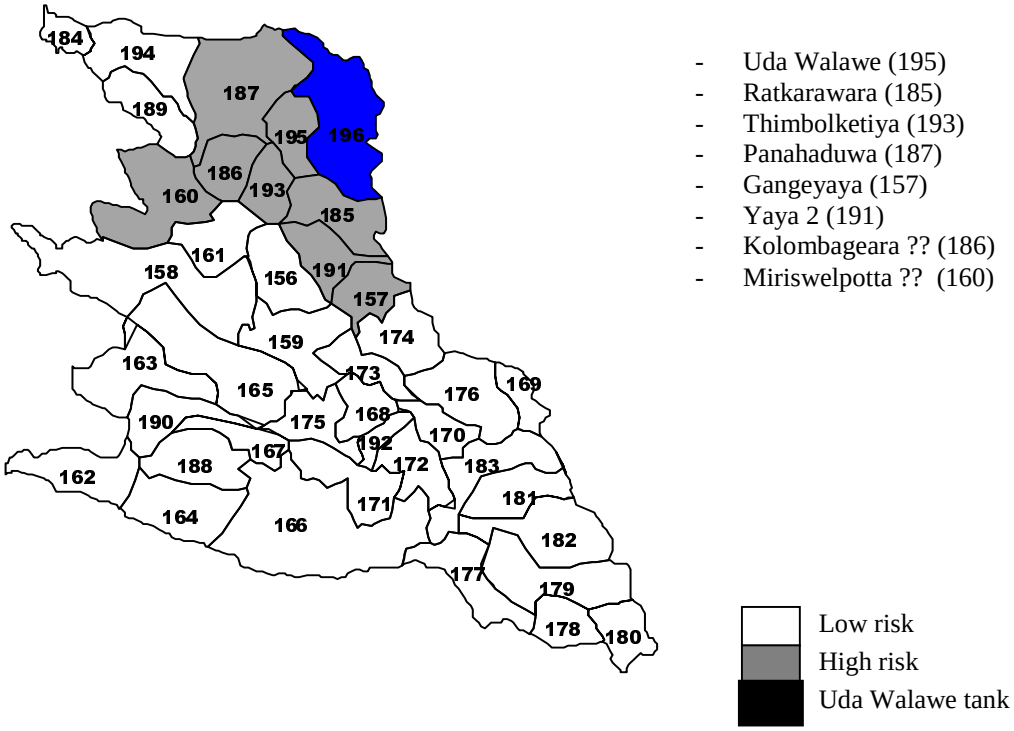
What could be done after the first analysis of the parameters was to point out high risk factors and high risk areas, which could be used to target malaria control or maybe even monitor certain parameters or occurrences of certain events that are likely to have an impact on malaria incidences.

Dr. Gunawardena went on to state that IWMI was currently doing a study in the Moneragala District investigating whether soil moisture data derived from satellite images could be used to predict impending epidemics. This was being done with data from the December 1999- February 2000 epidemic that occurred in the district.

Presentation: Embilipitiya DSD

By Mr. N.B. Munasingha, RMO Embilipitiya

High risk areas:



Mr. Munasingha opened the presentation by stating that what he was presenting at that time was a summary of the results of the group discussion and that it did not necessarily reflect his personal opinion.

Apart from the areas identified by him that morning (see page 5), the group felt that 3 more GNs should be added as high risk areas. These areas were identified from the personal knowledge of the group. According to the group, apart from the four areas earlier indicated (Uda Walawe, Ratkarawara, Thimbolketiya and Panahaduwa) the GNs of Gange Yaya and Yaya 2 should also be added as high risk areas. Mr. Munasingha himself was not in agreement with the addition of the latter two areas as high risk as there was no data to confirm this. He said that there were problems with the data for that area and he believed that cases were sometimes assigned to the wrong GN.

Two other questionable areas that were indicated as high risk were Colombage Ara and Miriswelpotta. There was a debate within the group as to whether these two were high risk areas or not. Munasingha's personal opinion was that these two should not be indicated as high risk areas, while the group felt that they should be. Therefore, as could be seen from the map of this presentation (see above) there was not much difference from the map that was shown by him in his presentation this morning. It was noted that the high risk areas were closest to the Uda Walawe (tank) region.

Environmental risk factors:

Mr. Munasingha stated that since the question only asked for environmental risk factors, the group concentrated on this aspect and other factors such as socio-economic etc. were not addressed.
The environmental risk factors present in the Embilipitiya DS were

The natural water ways (Maha-ara, Malabota-ara, Meegeha-ara)

a. The rainfall pattern (see page 5)
b. People migration
c. Sugarcane cultivation in the Uda Walawe/Sevenagala area.
d. If risk could be related to a crop then it was sugarcane. People go to the Sevenagala area for temporary work during sugarcane harvesting. People get infected with malaria during this period and return with malaria. The sugarcane itself is not the risk factor but during their work related to the sugarcane harvesting people live in temporary huts in the Thanamalvilla and Sooriyawewa areas, near the sugarcane area, where there are a higher incidences.

Role of risk mapping in malaria control:

a. Planning
b. Targeting
c. Resource management
d. Implementing
e. Forecasting
f. Stratification
g. Larviciding
h. Impregnating bed nets could be started and maintained

Felix Amerasinghe stated that in addition to these factors evaluations and control strategies could be done. Mr. Munasingha agreed to this.

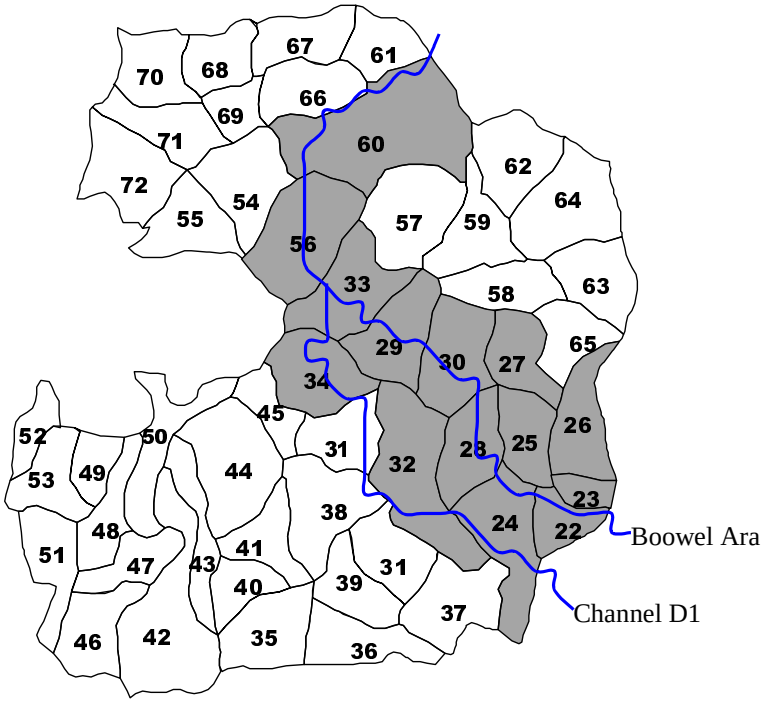
Dr. Gunawardena asked Mr. Munasighe what the most significant factors contributing to malaria transmission were in the Embilipitiya DSD. He replied that there were many factors contributing to malaria transmission such as parasite reservoir, vector breeding and that these factors, together with the migration of the population, were responsible for the malaria prevalence in the Embilipitiya DSD.

Presentation: Angunukolapelessa DSD

By Mr. D.S.K. Devasiri, PHI AMC

High risk areas:

Angunukolapelessa (22)
Achariyagama (23)
Yakagala (24)
Aluthwewa (25)
Kankanaagama (26)
Binkama (27)
Helakada (28)
Dandenigama (29)
Karagahawela (30)
Jandura (32) - part
Pahalagama (33)
Soriyapokuna (56)



According to the group there was no local transmission of malaria in 1999. All the cases were imported to the area. Water is in short supply part of the time and people move to an area where there is no water problem and return with the disease. In addition, people go to the Thanamalvilla area for *chena* cultivation and return with the disease. Another group of imported cases were the people of the area who served in the Sri Lanka Armed Forces, who were located in the North and the East of the country.

In GN 51 only 10 cases had been recorded and it was apparent that there was not much disease reported from that area.

Environmental risk factors:

a. Migrant cultivators from Moneragala
b. Returning personnel attached to the Sri Lanka Forces and operating in the North and the East
c. Surface water (minimum effect)

Role of risk mapping in malaria control:

In control activities for screening of fever cases, prophylactic treatment and identification of parasites and ability to adopt an eradication process.

Presentation: Sooriyawewa DSD

By Ms. B.S.L. Peiris, RMO Hambantota

High risk areas:

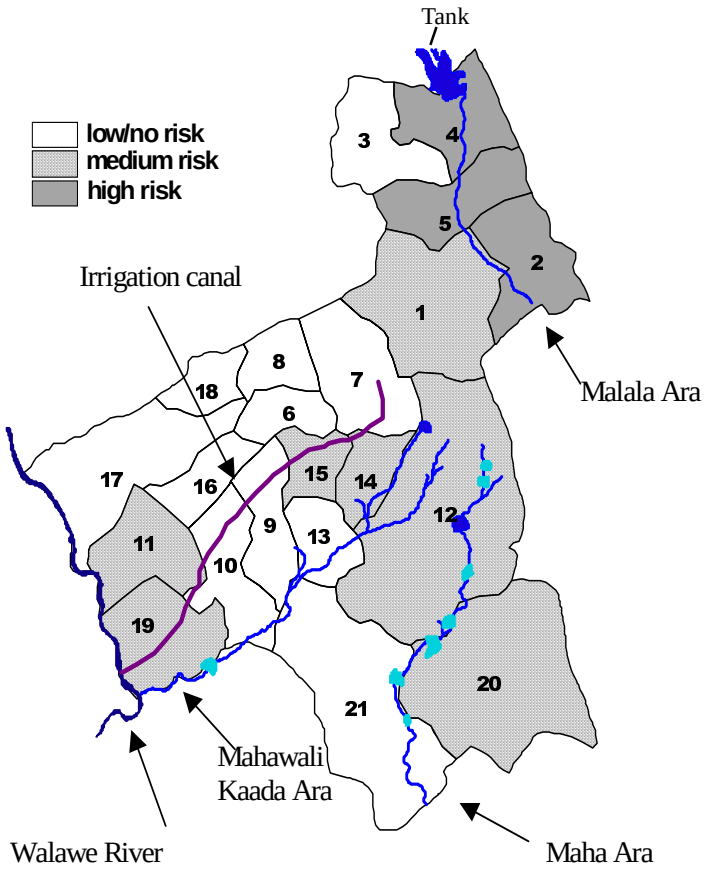
- High risk:
- Mahagalwewa (4)
- Meegahajandura (5)
- Ranmududwewa (2)

Moderate risk:

- Ihala Kumbukwewa (3)
- Weliwewa (1)
- Andarawewa (12)
- Wediwewa (20)
- Mahawelikada ara (14)
- Beddewewa (15)
- Weniwelara (11)
- Bedigantota (19)

Low risk

- Rest of the area



Environmental risk factors:

1) Main water sources in the area:

- Malala ara
- Maha ara
- Mahawelikada ara
- Walawe ganga
- Weniwel ara
- Andarawewa
- Mahagal wewa
- Ihala Kumbukwewa
- Pahala Kumbukwewa
- Maha indiwewa