

## THE IMPACT OF EARTHSLIPS AND LANDSLIDES ON PLANTATIONS

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The impact of earthslips and landslides on plantations as did occur in the recent past, totally dislodges the routine life and systems on plantations. In the instance of the past earth movements, the areas in Badulla and Nuwara Eliya were severely affected, and if I correctly recall to a degree not that profound ever before. The calculated approximate loss in cost to the Organization is in the region of a staggering fifty million rupees, which this Organization, in today's context of profitability can ill afford. This financial requirement is only to bring back the physical damage to the degree prior to the impact of earthslips and landslides. I must say that equating the turbulence and disturbance to the infrastructure and the personnel in money is grossly unfair, as loss to life and damage to the belongings and buildings, of those affected cannot be evaluated in finances - and more-so it is unfair and unethical to do so. I draw your attention to the Kantalai disaster - as the theoreticians equate its damage essentially to the loss in money - going into millions of rupees, but the resultant loss to life, homesteads, crop, irrigation facilities etc., besides the disturbance, emotional and sentimentality cannot be calculated in money terms, but, which if arbitrarily equated - then will run into billions from the constructional losses of only in millions. Hence, the millions when placed besides the billions appears to be fractional by comparison. The reason for my being specific on these equations and my evaluating them in comparative finances is to unfold the seriousness and the severity of the impact of such happenings, which are in most instances due to neglect and inadequate vigilance and forthright reporting. The instances of this phenomenon has been manifested in the recent past - and not it is hence obligatory and of utmost priority for this intellectual assembly of learned personnel of proven practical and intellectual ability to form itself into a potent and powerful force to monitor, report, and correct such happenings of earthslips and landslides long ahead of its actual

physical manifestation in masses of soil, water and rock flowing down at torrential rapidity and severity, causing untold damage and misery in its wake, and then only, thereafter to take stock and get alert to hold post-mortems of what has occurred and also why it did happen. This practice must be now deleted, as the intellectual body we represent - of course without me, who does not profess to be one - should not await a crisis or catastrophe to occur - but be alert and vigilant to arrest its happening, by diagnosing the symptoms earlier to the happening. This, then would be a laudable conclusion, and much heralded as it would save the catastrophic effects of the actual happening. I must say to achieve this, the group, we represent should initially isolate out finances on a pre-determined estimate of costs - to form the necessary infrastructure of geologically educated study groups, located and sited in probable and foreseeable landslide and earthslip prone areas.

These areas, I am certain can be isolated out by the dedicated band of competent geological scientists, that this country has been blessed to possess. Whilst appreciating the adequate competency of those who constitute, this study group, whose intellectual lectures, suggestions and analysis we have heard, I have no hesitation in condoning with their impediments to progress essentially due to inadequate finances to proceed and progress, whilst in addition being hesitantly stifled by having to abide by predetermined regulations and systems. What this study group in my estimation needs is a virtual 'open' or 'free ticket' to progress on planned programmes with reasonable adequacy of finances. We have to appreciate the financial stringency that has to be exercised by the government due to circumstances which can only be termed most unfortunate. But, I really wonder whether I am placing relevant 'Food for thought', when I query, as to whether an outright grant or a soft loan can be obtained for the formation of what I have narrated - from a Foreign lending agency of repute, like the World Bank, Asian Development Bank, or even a smaller Group, like N O R A D, who could finance this type of project - which

even in their opinion will have adequacy of financial return, and no doubt this intellectual and competent I F S Study Group on Landslides can prepare a feasible and an acceptable Project proposal report, to satisfy such lending organisations. May I strongly urge that these suggestions be pursued as we should not in the future allow the catastrophe to achieve critical proportions, and only then to become totally agitated and excited - to eventuate in the much used saying 'To close the stable door after the horse has escaped'.

I must be modest to declare that I am no educationist with letters behind my name and hence my experience and knowledge is one of a comparative mundane nature - gathered by living years in the agricultural field - and working myself up from that of a practical Agriculturalist in the field of planting to what I am now. Hence, what I suggest is down to earth - and is eventuating in consequence from the grass root level. My contention is that it is relevant for me to isolate out reasons for recent landslides in the Hill country and it would hence be interesting to analyse the reasons for these numerous landslides which have occurred in the hill country areas. Some of them could be identified as below:

- (a) Many soil conservation methods are adopted in the Tea Plantations or cultivated lands. These are terracing continued draining, soil tillage by forking etc.

These soil conservation methods while preventing surface erosion would also cause rainwater to percolate through the surface soil and reach the lower layers. Thereby, surface run-off of rain water is reduced to the minimum. This would increase the soil-water content resulting in spontaneous liquefaction and sub-surface erosion. When the soil-water retention factor is increased beyond acceptable limit for such land masses on Hill slopes which would cause the landslide. The soil-water retention limit of any land area would depend

on the structure of the soil and its steepness.

The water conditions that have prevailed in the hill country areas in the recent years, assisted in the occurrence of landslides. The usual dry weather which is experienced annually was absent during the recent years. Thereby, at the time of the heavy monsoonal rains the soil-water content of the land area was already high as the rainfall has been well distributed and the soil has not lost its moisture due to the absence of the drought. The monsoonal rains therefore increase the soil-water content beyond the required limit, causing the landslides.

- (b) The other factor is the destruction of natural forests in the hill country, illegally or legally, for cultivation of vegetable etc., and extraction of fuelwood.
- (c) The construction of large Hydro-power Reservoirs in the hill country has also caused a rapid draw-down of soil-water in the surrounding hill slopes causing earthslips.

#### REMEDIAL MEASURES

- (a) All uneconomical tea lands in steep areas to be planted in quick growing timber species. The tall timber species should be under-planted with short timber species, such as Accacia, Ipil Ipil etc. This is to obtain quick ground cover of these areas. It would also serve two purposes.
  - (i) Supply fuelwood to the Plantations.
  - (ii) Prevent surface erosion in steep tea areas.
- (b) All areas surrounding the reservoirs be heavily forested to prevent surface erosion silting of the reservoirs. It would also prevent any landslides in an around the reservoirs from

causing damage to the dams which would result in a sudden over-flow of water from the reservoir.

- (c) Surface water drainage system should be well designed to ensure that excess water is properly directed to a suitable outlet such as stream, river etc.
- (d) All river banks to be planted with species of Bamboo etc., to prevent under-cutting by river erosion.
- (e) Take precautions when undertaking excavation work for the construction of new roads, cutting sites for new building constructions etc., in estate areas to prevent landslides. For this purpose, it would be necessary to adopt proper drainage systems and terrace steep earth slopes etc.
- (f) Do not steepend or heighten earth banks beyond the required limit which would result in a earth-slip.
- (g) Identify earthslip prone areas and take adequate precautionary measures as indicated above.

In addition to what I have stated, I must also state that, many of the Reservoirs in the Hydro-power schemes in National Development under the authority of the Mahaweli Board are located at the foothills of the Plantations. One of the consequences of locking up large volumes of water in system of Dams and Reservoirs is that they tend to disrupt the natural under-ground drainage system, existing in the vicinity of these Reservoirs. The under-ground water therefore, has to escape through an underground re-routed drainage pattern, in order that the overall movement of water is re-established. In the course of its re-discovered route, the under-ground water begins to flow out in new channels. The result is that extensive volumes of earth begin to move directly above the new drainage

system, causing earth-slips and landslides, the moment there is heavy rain fall and considerable seepage.

It will thus be necessary for the Department of Geology to undertake detailed studies of soil structure, relevant seepage and the patterns of movement of underground water on estates located within close geographical proximity to the large Reservoirs such as Victoria, Kotmale and on the Eastern side Randenigala.

The primary purpose of such a study should be with the motive of advising the estates on the following.

- (1) To evacuate existing residents of danger areas.
- (2) To advise the estate authorities of areas suitable for construction of new housing programmes being undertaken on the M T I P.
- (3) Such a study in detail will also help in the forward planning of replanting programmes such that soil movement even at a surface level as would be necessary in an overall replanting programme be minimised in the areas susceptible to landslides.
- (4) Advise Management Authorities on what agricultural practices such as minimising soil erosion, establishment of a good cover of tea fields, establishment of shade, establishment of fuel trees in ravines and boundaries would in fact help control the amount of seepage and therefore reduce the risk of large scale earth movements in the form of earthslips.

Some of the estates affected are High Forest, Gonapitiya, Maha-Coodagalla, Gordon, Waldemar and Maturata.

Apart from the earthslips and the damage caused by them during

February of this year, in the Udupussellawa/Maturata areas, there have been large rifts created by earth movement in tea fields located just above existing residential facilities to workers on these estates. Thus far, these rifts have been unattended to and no further remedial measures have been implemented. We anticipate the N/E Monsoon in October/November and definite preventive measures must now be taken to avert any form of calamity that could arise when heavy monsoonal rains are precipitated.

We in the estate sector, lay maximum emphasis on the control of soil erosion. We also encourage at every turn given the correct financial resource the building up of soil organic matter, so vital in the improvement of soil structure. You will realize that the building up of soil organic matter helps retain soil moisture and make it available to the plant, while it reduced the extent of seepage that really causes large scale movement of earth.

Thank you very much for your kind indulgence in listening to my address. I thank the Director - I F S and Chairman I F S Study Group on Landslides for allowing our Organization, the Janatha Estates Development Board to be represented and I am certain that my Chairman and Secretary - Mr Pemsith Seneviratne, and his Board of Directors of which I am one, will be only too glad to be of assistance and help at anytime in tackling this task, which can no doubt reach berculean proportions, if allowed to be neglected. I close by saying that a 'stitch in time saves nine', and that we should not wait 'To close the stable door after the horse escapes'.

Thank you again.