

TECHNICAL PAPER 2 - REPLANTING / INFILLING / HARVESTING / YPH / WEED MANAGEMENT / PEOPLE

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RE-PLANTING & INFILLING MUST BE 'ON-GOING'

This Paper is in backdrop of a majority of RPCs balking at prospect of planning and sustaining a well coordinated Infilling and Re-Planting Program due to [faulty] perception that the ROI on Replanting does not warrant Re-planting! A simple logical response would be that if Re-planting [and indeed Infilling] is discontinued or done haphazardly in nominal extents, then how does one counter dwindling productivity caused by die-back of tea bushes after pruning, disease, harsh weather conditions etc? The YPH which is the barometer of the health/productivity of a tea plantation depends primarily on the number of bushes per unit area, ha, acre etc and the vibrancy of each bush. If the points per ha/acre is well below the stipulated 13,500 / 5000 bushes respectively and if the vibrancy of remaining bushes are poor due to a myriad factors then the YPH would be negatively affected with its spiraling domino-effect!

Apart from the low productivity directly due to lack of bushes per unit area the resulting bare lands cause pockets of infertility, compaction of soil, and eventually soil sterility in such 'vacant' patches which are 'infectious' to the surrounding tea as well due to various factors inimical to overall health of tea. The aim must be therefore to minimize and eventually have zero-vacancies in a commercial track of tea.

In view of the above negative scenario it would be logical to get on to a well planned, coordinated and simultaneous twin-pronged tea re-planting and infilling program that is sustainable and oriented to achieve 3000 kg/ha plus where the re-planted areas are concerned. A Tea plant CAN be brought to maturity in 24 months IF effectively and enthusiastically monitored from selection of mother bushes to nursery environment to creating the 'right conditions' in the field. Extensive soil rehabilitation should never be a nominal operation. Planting of Mana grass to be done as close as possible, effect proper conservation via drains etc, then lop every 45 days; fertilize every other lop and one would then have enough rich, carbonic matter within 12 months!

When planting tea comes along – one should ensure that **each** planting 'hole' is of required dimensions; **only the best nursery plants** go out to the 'Clearing' – that is an absolute must! The formative period of the first 14 months are critical as is the retention of moist conditions in soil by copious thatching, prevention of erosion of life-enhancing top soil and precious humus; the high/low shade is already established **before** introducing tea plants –once again a critical factor – often overlooked! The timely and judicious ground and foliar nutrient applications need to be emphasized. Of course the young plant needs to be 'framed' so that its primary and secondary braches would blossom to support a vibrant, potential plucking table – the economic base of each bush and by extension the entire field that would directly contribute to the overall productivity of the whole plantation.

So the raising of the YPH of the nucleus plantation is a sine-qua-non for reasons obvious – higher productivity would lower costs significantly. Presently many RPCs take easy way out by opening their factories for Bought Leaf Operators – this is a ‘Double Edged Sword’ – Quality of leaf is adversely affected. One then is at the mercy of unscrupulous Leaf Collectors. Bought Leaf per se is not an evil option but it should not be the primary source of leaf. Each estate unit should be self-sufficient. Then taking on B/Leaf under strict conditions and monitored daily would be a bonus!

NON-PRACTICAL BUDGETS BEING THRUST ON PLANTERS? Today we see tinkering of budgets a.k.a. ‘Estimates’ in plantations – Managers left out of equation, are ‘handed over’ budgets that are mostly un-workable with nominal amounts ‘allowed’ for each item under say, ‘Draining, Thatching, weeding etc based on, at times, inflated crops! In this scenario Managers are mortally scared to ‘over-spend’ ANY such item. Efficiency appears to be – you are given 1000/- rupees as ‘budgeted’ and if you ‘spend’ 950/- you are a ‘good boy’ – regardless of the ‘ground situation’!

Costs then reduced by increasing yields and not by fudging figures whilst dropping overall standards, withholding essential macro/micro nutrients and weakening our primary assets – our tea bushes! We did not make the capital value of our plantation units decline as is sadly evident by observing state of ‘estate roads’ for instance; akin to dried up river beds!! And ‘New Clearing’ appearing like deserts with young twiggy plants, wine-glass shaped, making a Herculean effort of surviving the rigors of sun, wind and drought and/or excessive rains!

No wonder many – especially those in Finance look at ‘tea Re-planting’ as an absolute waste of money – ***it would be a waste if we go on re-supplying 70% dead plants each year!*** The expected returns would not even reach levels that the old-seedling fields [that were uprooted] gave! Do sub-standard work – constantly looking over shoulder at those accursed un-workable budgets and that would be the result – useless clearings that would have to be later abandoned!

Reverting to Re-Planting - Managers should be given an overall total budget for entire clearing; and not itemized allocations for each sub-item. Because each acre / ha of land has its own peculiar issues to deal with. For example some sections may need more intense draining or terracing or thatching as the case may be. **Need-based budgeting based on practical experience ensuring quality is essential. We have to move away from earlier practice of forcing down throats of Superintendents un-workable estimates that only look good on paper but of no value overall!**

People often ask this writer how he did increase YPH / Productivity / lowered costs in all tea plantations he managed whilst with the industry for 38 years. His answer is simply thus:

Look after the ***SOIL, BUSH & PEOPLE.***

Let’s ponder the above 3 elements – how would your tea plant/bush grow without the support, moisture and nutrients from the soil? Many are under the mistaken notion that ‘soil’ is only an inert medium of only offering ‘anchorage’ to the bush – wrong!!

OUR HIGHLANDS & FERTILE RAIN-FED LOWLANDS – IDEAL FOR TEA, STILL!

Some Heads of RPCs proclaim that much of SL's tea estate soils are 'old' and would not lend itself towards producing healthy, vibrant tea bushes. Whilst certain areas may be too steep and / or constantly buffeted by strong winds, many of the so-called sterile soils or at least their condition symbolizes gross neglect and abysmally poor management over an extended period of time; however ***much of it is reversible.***

AIMLESS 'DIVERSIFICATION' IN THE PAST WAS A WASTE OF RESOURCES

The aim should be to increase the national YPH of our tea [RPCs and Smallholders] with a **reduced** extent and diversify all other areas for productive pursuits. 'Diversification' became a hastily contrived 'escape strategy' during the JEDB/SLSPC era and sadly even adopted by some current RPCs! For instance if a field was/is 'difficult' to manage – full of weeds, prone to illicit plucking, too far from worker quarters etc they used to 'diversify' on to forestry [a few gum trees here and there!] or spices – a sprinkling of clove trees, coffee trees, passion fruit etc without ever pondering that the same issues might crop up later or worse robbed with impunity! Result? Productive tea / rubber lands being abandoned!

COMMERCIAL FORESTRY & OTHER VENTURES YET UNTAPPED Some present RPCs have identified commercial forestry as a viable venture as it would cost around Rs 32/- to manufacture just one kilo of tea, using imported oil as opposed to a mere Rs 8/- to manufacture one kilo of tea using fuel-wood. It has been analyzed that the plantation sector alone would need around 4,000 hectares of commercial forestry.

Yet it is not only 'Forestry' that the plantations need to diversify. A planter has only got to use his imagination and creativity and he'll see so many other potential ventures that would bring in the \$\$\$. Fuel-wood, high-value timber, export oriented greenery / vegetables [also for local market], exotic fruits, cut-flowers, spices such as Cinnamon [*Kahawate RPC had got onto Cinnamon diversification very well in much of their low country estates*] inland fisheries, dairy farming, livestock [piggeries, poultry farming]; Cocoa, rain-water harvesting, commercial wind-power, hydro-power, solar power grids, converting factory roofs with solar Panels; agro-tourism – hang gliding / trekking, photo-ops, eco experiences etc.

A plantation should not be perceived as a mono-crop venture anymore; rather as resource-rich lands that abound with natural resources aplenty – innovation and creativity would work wonders!

SOILS ARE NOT A STERILE ENTITY. DON'T MAKE IT SO!

There are no 'quick fixes' of making soils fertile. We need to get our basics right and have bags of patience; besides meticulous planning and timing of any agro-operation is all so important. Also we must strictly abide by the 'Rules' of Mother Nature when it comes to 'planting' in all its facets!

Yet before the writer gets onto the 'The Tea Bush' – think of soil pH vis-à-vis tea, soil porosity, soil compaction, moisture retentive qualities of soil; moisture percolation ability as against water running off on surface; cat-ion exchange capacity etc. There is an absolute necessity to establish lateral and leader

drains; to deep fork, to mulch and thatch soils; to bury prunings perhaps; to attend to stone / live terracing on a need basis etc. If ignored your soils would be soon depleted of its moisture retentive qualities and fast descend to that of compacted, gravely and worse, sterile soil that would encourage surface run-off, making even make NPK applications a waste!

YEILD PER HA [YPH] – A MUCH ABUSED AND MISQUOTED TERM!

Before working out the Yield per Hectare one must consider the following significant factors germane to YPH: the barometer of the health and standing of a commercial tea estate.

[1] 'Stand' per ha [No of bushes in each ha]; is 'census' taken of bushes at each pruning? Bush stand 20 years ago may be significantly reduced today, if no infilling done! How can we term a 'tea acre / ha' thus if its bush population is only 3000 / 7500 per acre/ ha?

[2] Mixed stand or exclusively seedlings – if so 'Old Seedlings [prior to WW11] or New Seedlings or 'Clonal Seedling' seed taken from cloned mother buses. OS were planted on the 'Up & Down' system and not planted on the contour. Hence its Bush Stand much lower than if planted on contour.

[3] Pure VP Block – if so mixed cultivars or separated into Clonal blocks. VP tea could yield at least 3 times more than OS tea; certain cultivars such as TRI 3000 & 4000 series are higher yielding and would thus produce more than some of the say, darker pigmented clones.

[4] The vibrancy / health of bushes overall – here soil moisture / shading [or lack of it] NPK inputs – ground / foliar; then degree / harshness of tipping / plucking impact on bush growth/yields. Today some estates have secured 3000 YPH mark; some linger at 700 kg/ha!

[5] In a typical 4-year pruning cycle did one attain the 'Maximum Spreading Potential' [MSP] of the bush by its 18 month post-pruning? Each bush must spread to its maximum spread within 18 months after pruning. This can be ensured by trained pluckers and close monitoring. In short – better the spread higher the number and density of potential plucking points on plucking table and thereby translates to higher yields. Dynamic & close supervision needed.

[6] Are all bushes 'pluckable' – here there are possible constraints – e.g. height, bush tables covered with creepers, bushes located on too steep a terrain, bushes skiffed at 'last plucking round' to counter excess height etc. Unattainable heights mean unplucked tea bushes. Period! Harvesting must be elevated to A1 priority in field supervision, always.

MONITORING OF QUANTUM PER PICK PER ROUND

There are countless areas of bush management, to say the least! However one glaring factor that supervisors miss out is to monitor the quantum per pick at each plucking round. The 'totals' of each round should not vary more that 5 to 8% plus or minus. If there are high variations per pick one could safely assume that only a part of the field is plucked but shown as totally plucked or some leaf is robbed by people of adjoining estates or worse illegal plucking under moon-light where such leaf is siphoned off

to shady Green Leaf Collectors! Or simply 'false' plucking rounds! Units that display dramatic YPH drops display these issues.

LET US TACKLE 'WEEDING' SCIENTIFICALLY!

If plucking is the costliest and most labour intensive operation on a 'tea-estate' then a 'close second' is the cost of NPK Fertilizer and of course weeding – ground condition maintenance. The writer recalls the challenges he faced in keeping estates weed-free in the early days of his career. Much of the 'Weeding' was done using implements such as 'Scrapers' which did much harm to soil as it would loosen it and expose it to be washed away during the rains. Weeding was considered a 'necessary evil'!

One must realize that 'weeds' like any plant need sunlight, moisture and 'good soils' to thrive. All 3 elements need to be present for weed growth. Moisture and 'good soil' cannot be reduced or eliminated; however sunlight if controlled would significantly lessen weed growth – hence Mulching, establishing cover-crops and 'Thatching' on weed-seed-free surfaces would ensure weed free conditions! Apart from mulching and thatching, bush-to-bush merger of tea bushes would effectively reduce sunlight penetration towards triggering off germination. Weed seed germination is from seed availability – which comes to being from flowers of weeds.

So weeds must be 'tackled' before flowering!

The use of herbicides on large commercial tracts of tea lands are needed – if used judiciously and timed. Some pre-emergent weedicides need to be sprayed on bare ground before pruning along with the Dolomite Applications. These two operations done **once in 4 years** in a 4-year PR Cycle field would reduce excess soil acidity plus effectively lessen weed-seed germination on pruning when sunlight starts to stream in and would otherwise trigger large scale germination of weed-seed. At 'Tipping' and thereafter at each plucking round for 18 months one only needs to uproot manually the few weeds that spring forth until bushes have merged – after which weeding per se is not an issue if bush to bush merger was achieved during 18 month period after pruning.

The trick is to proactively tackle the question of weeding or 'Ground Condition Maintenance' – go for it [manually or chemically] before flowering of weeds. This is absolutely essential. One should avoid spraying of herbicides on tall 'flowering weeds' that are seen even above the tea bush table – the 'spray drift' would effectively scorch much of the side branches besides being a waste of funds as herbicide are ineffective on mature weeds or weeds with a rhizome!

To keep a plantation absolutely weed-free is not by using implements but by the 3-pronged strategy of manual / chemical & cultural [thatching / bush-merger]. One important point to remember is if one takes over an estate 'riddled with weeds' one cannot have low weeding operational costs during the first 3 months. If for instance estimated cost of weeding is Rs 400/- per ha you cannot do weeding at such costs initially. One may have costs of even Rs 1,000/- per ha to start with. However it would gradually reduce along with the 'weed population'. Sadly some RPC Heads insist that Managers 'show' such costs 'within the estimate' from Day One. Result? ***One significant section of the plantation would be in heavy weeds and may not even be 'fully plucked' – thus materially reducing the YPH!***

YIELD PER HA BASED ON 'REAL' GROUND SITUATION

Accordingly the Yield per ha means much more than a mere figure. However it is vital that all estates, 40 hectares and above at least are re-surveyed field by field; excise areas with large boulders, mini forest blocks, gardens etc. So the survey should actually reflect the tea area per se. Furthermore those fields having less than a minimum stand, say 7,500 per ha or 3000 per acres should be temporarily removed from 'Revenue Extent' – the reason for poor YPH should be ascertained; then one should get onto a proper Replanting of field. Infilling could also be considered but it should be done for fields having around 65% stand so that a max percentile of 35% could be tackled. ***If Infilling is carried out at each pruning then the question of a dwindling bush stand does not arise!***

CULLING OF WEAK BUSHES

During much of the late 1960s, 1970s and well into the 1980s the writer recalls that culling of weak bushes together with uprooting of dead bushes were done 24 months before pruning in mature fields and such areas squared off and planted densely with a suitable grass such as Mana [Guatemala was less preferred because of its tendency of crowding the surrounding healthy tea bushes] and then lop the Mana @ 45 days and fertilize with Grass Mixture such as U.625 every other lop, i.e. 90 days. And so when pruning is eventually carried out, these grass blocks would have been adequately rehabilitated. Infilling then is carried out as an essential post-pruning operation along with applying 'Limbox'; Mosing & Ferning well before 'Bud-Break'; 'Draining' mostly to reach its original 'Lateral Drain dimensions'; repairing all broken stone terraces; deep forking and even burying of prunings in fields with 80% stand and above. The idea was to ensure retention of healthy bushes and introduction of new bushes that would replace the old, moribund and indeed dead bushes. Naturally even the so-called old seedling fields [OS] due to effective infilling, yielded even 2000 kg/ha or more!

However, Infilling amidst poor / senile seedling tea is also futile because of the disproportionate nutrient demand of the younger bushes and consequently the bush returns for plucking – some bushes would be ready for harvesting whilst the others of the old seedlings would be in 'bud-stage'!

From 'Soils' & 'Bushes' this writer gets on to the vital 'People' of a plantation.

'PEOPLE' ON ESTATES

'The People' are all those attached to plantations – typically the workers, staff and executives; yet one should also take the children and 'pensioners' into the equation too as they too would have a hand in total productivity! Anyone who is directly and or indirectly affected by activities on a plantation: would form the definition of 'people' on a plantation!

Let's take the pluckers – those who are entrusted with harvesting tea bushes of an estate to begin with. The usual practice is when a child – usually a female is around 15 to 16 years they are selected to pluck certain 'old fields' [to do least damage to the plucking table!] or some are supposed to be tutored by an experienced plucker and after a few months of such 'training' they are drafted in to the main gangs of

pluckers. The question of planned and structured HRD type initiation did not and does not really get the attention it should receive!

The undersigned recalls when he was managing SL's largest tea property – Hapugastenne, he realized that in order to extract its potential he had to recruit at least another 100 pluckers urgently. The problem was that all the resident pluckers were already deployed on plucking! He was then compelled to source potential pluckers from a radius of up to 3 to 4 km from the divisional boundaries by sending out motivated 'scouts' who were briefed on the 'profile' of the pluckers required – at least physically – we did not want emaciated runts to begin with! Surprisingly quite a few sturdy-looking young females turned up – most of them had never 'touched' a tea bush, leave alone plucking them!

However most of them had done their O/L – some even had passed their O/L in Science subjects! Plucking would have been furthestmost away from their minds! We called them '**Harvesters**' and gave them attractive T-Shirts with the term '*Harvesters*' emblazoned only after the writer carried out a crash course of 3 weeks on theory of plucking even giving them botanical terms relevant to the tea bush and leaf, photosynthesis, transpiration, naming the different leaves etc and do's and don'ts of plucking with appropriate scientific terms in Sinhala – that struck a chord with them and they gradually changed their attitudes! Then we got onto to the practical side of training plucking aided by the champion pluckers, capping it off by selecting the best three trainees at a 'test' based on theory & practice!

VILLAGE LASSES TRANSFORMED INTO CHAMPION PLUCKERS

Within a mere six months down the road these very same young 'village lasses' became champion pluckers themselves, beating those experienced ones hollow! This trained and motivated group of pluckers certainly helped towards establishing records in YPH hitherto never ever reached and exceeded thereafter! So pluckers need to be carefully selected and thereafter vigorously trained both in theory and practice before they are sent out to the fields. *We need to motivate them. We need to listen to their issues/ woes at home; we need to know what type of food they consume; they need to be aware of the importance of consuming milk, eggs, pulses etc. We need to check their blood and see if they are anemic; if so immediate action be taken with iron supplements etc. [Please refer to attached 'Plucker Profile']*

Before looking at improving the quality of an estate, one must improve the quality of his workers – overall! Isn't this then fundamental without looking at workers and / unions with an adversarial stance? **Workers are not a 'cost' to be cut! Instead a motivated work-force you sincerely love as they could then do wonders that were hitherto unimaginable!!**

Plucking [harvesting] was and is the costliest item on a tea plantation. It requires much planning, training, motivation of gangs, monitoring physical / mental aspects of pluckers etc. Sadly little supervision is seen by many estate executives on this vital aspect!

THE ESTATE MEN MATTER TOO!

The next matter under 'People' – the other workers apart from pluckers: usually the male 'sundry' workers – here too one must identify the inherent talents of each and every worker – looking into

historical data / kanganyies' assessments and decide further on what type of further training they need, depending on their physical attributes, general behaviour and of course the needs of the estate – both short and long term.

For instance on one estate, on assumption of duties the writer found that there was an apparent dearth of 'Pruners' – the young SD [Assistant Superintendent] had been 'told' that that was it! We called for the checkrolls of the past 4 years and it transpired that quite a few workers who had feigned ignorance on how to handle a pruning knife had in fact been enthusiastically pruning! On further probing it was revealed that most of the pruners had decided on a plan to inform the new '*Durai*' / Superintendent [the young SD had also been relatively new] that they did not know how to prune! Pruning is considered one-of-the toughest physically taxing jobs on a tea estate; we did not adopt a confrontational course but spoke to each of the 'actors' on a one-to-one basis [addressing them together would have been suicidal!] and before long they were smiling, willing and able pruners!!

Similarly the estate's executive staff – Manager and executive assistants must keep a record of each and every worker and then by extension even their dependents – one must know their names [including their nick-names!] details of their houses / toilets / gardens, even names of their pet dog and more importantly their proven competencies and potential. Would they fit [pruners apart] in as good carpenters, masons, even cooks? One has only got to look at the bigger picture – we did so during the pre-computer era. How easy record keeping of such magnitude would be in today's context!

THE PLANTER SUPERINTENDENT – STILL THE PIVOT!

The estate Superintendent should be the sole authority. Yes he could either make or mar a plantation. It is therefore absolutely essential that one looks into all possible aspects before recruiting a young man to take job of planter-trainee and thereafter to rise up as an Assistant Manager and finally to being a fully fledged Superintendent / Manager.

An athletically sturdy man would be preferred; yet one must not ignore the intellectual part of it! Remember iconic planting personalities like Ranjan Wijeratne, Ken Balendra, Sepala Ilangakoon etc were renowned planters in then Ceylon [now, Sri Lanka]

SOME OF TODAY'S RPCs: Some of the present day RPCs have some excellent tea and are indeed managed very well. The writer could pick out RPCs like Bogawantalawa, Talawakelle, Watawala, Elpitiya – that still appear green and robust! They could however still intensify their Replanting ratios and innovativeness! Conversely some RPCs are incompetently managed with dismal results.

Bogawantalawa RPC being run by an astute non-planter, namely Jayampathy Molligoda has shown the rest how to look at plantations from a different paradigm. He has identified the resources of each unit innovatively and indeed pragmatically. One needs to stop and identify the latent, albeit untapped resources that each estate is blessed with and then plan and nurture parallel business ventures which need not be only Tea, Rubber, Cinnamon etc. For instance Kahawatte RPC is moving away from one-crop model to multi-cropping. We need to think afresh, yet the existing plantation crops need to be protected and its products enhanced by value-addition. *Dyan Seneviratne*

