

**HOW TO PROCEED WITH  
PRODUCTIVITY MANAGEMENT  
AND  
IMPROVEMENT OF OUR  
FORESTRY ACTIVITIES**

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**SAFODA**  
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Agency

**Sabah Re-Afforestation Technical Development  
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## Foreword

We are conducting forestry as a productive activity. When we produce something, we at first make a plan - what we are going to make - then we carrying out the plan and check the result; the way of production, products. It is essential for our productive activities that the above mentioned "PLAN, DO, CHECK" are carried out and we have to make efforts to improve our activities according to the check.

In this text book, I have written down the way of thinking and procedure for trainees to think and carry on their activities more effectively. I expect every trainee to study and discuss more about the way and method of improving their activities and adopt the suitable way for their site.

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## 1. INTRODUCTION

We plant trees every year and tend them against weeds, pests and diseases. In future we fell them and get the income. That is to say we run forestry.

In running forestry, we have to get a good result; completion of works or production of productive goods - using and coordinating efficiently the three factors such as "MAN, MATERIALS AND MONEY".

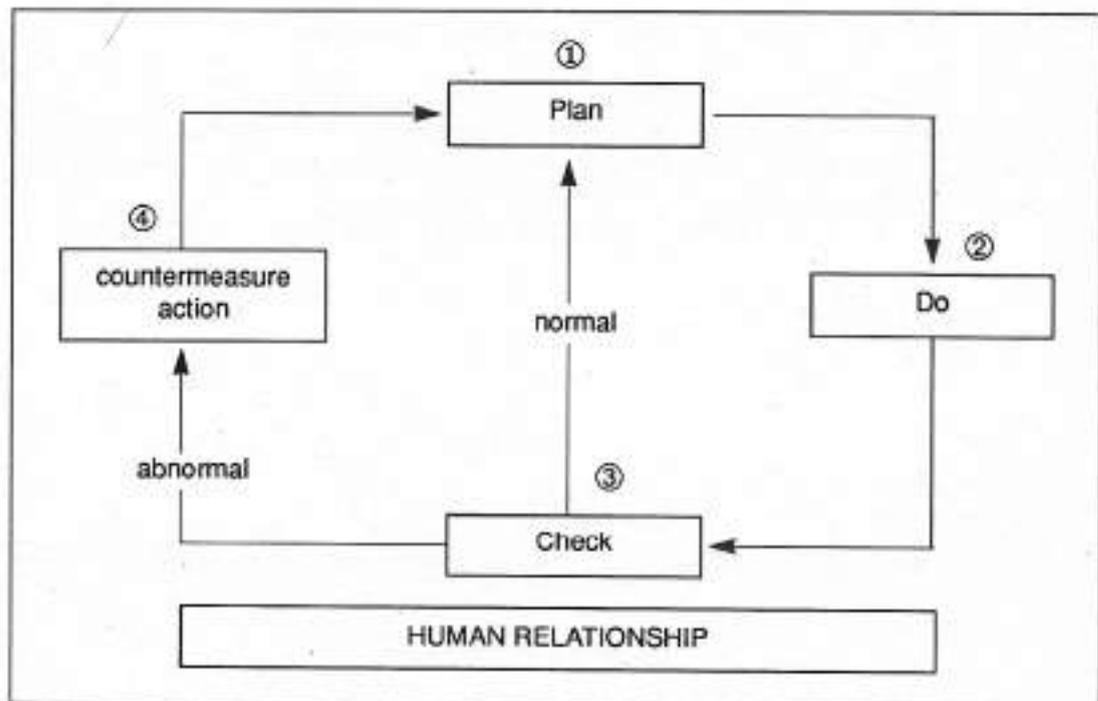
If we want to run forestry continuously, we have to get profit finally through management activities that include all productive costs (plantation, tending, felling and management). Even if we do not tend to get profit, we have to carry on efficient activities; effective and efficient completion in a certain budget.

In our project and SAFODA's works these important points are exactly the same and the ways of proceeding with the work for that purpose are:-

- to plan according to the objectives of the project.
- to carry on the work without unreasonableness, unevenness and wastefulness.
- to check the result.
- to revise the plan or improve on how to carry the work through evaluation and reviewing our work.

When we practise the management cycle below, we can go on with our management smoothly and efficiently.

Figure 1 : Management Cycle



As figure 1 shows, a cycle of flow (plan → do → check → action → plan) is essential for smooth production and the management that carries on the cycle smoothly is what we called "production management".

In this management cycle, I have mainly written the subjects below:

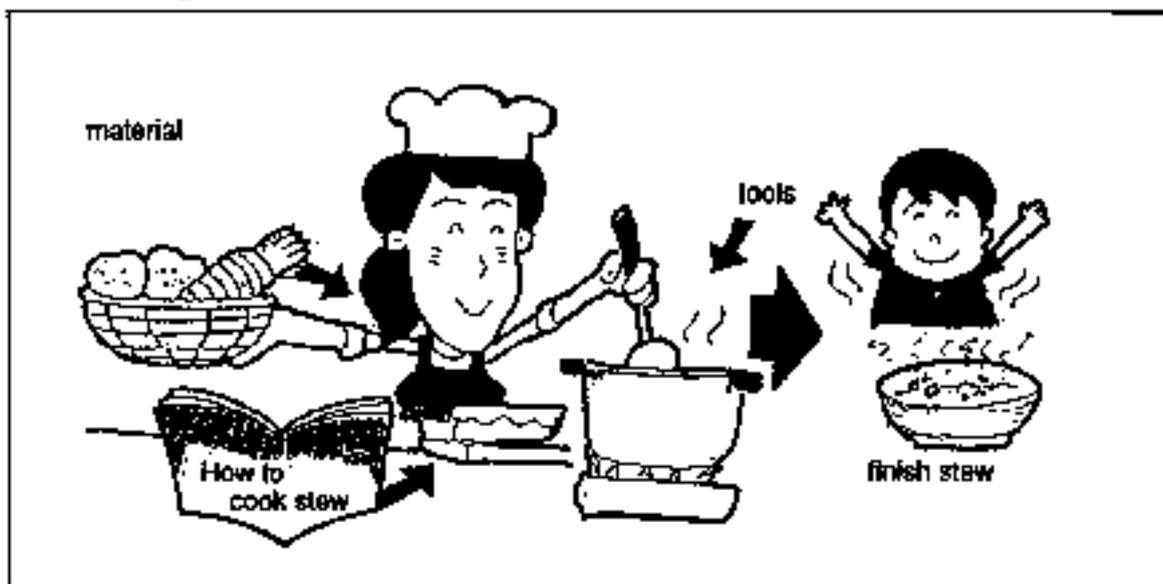
- How to make production plan.
- How to improve the way of working through implementation of the plan.

## 2. PRODUCTIVITY MANAGEMENT

### 2.1 What is a production?

A production defines "to make goods". For example: - we quote the case that house wife is going to cook stew. As figure 2 shows, she cooks stew using some materials, in the process she coordinates manpower and tools and materials and prepares the stew. But it is not enough to only cook stew and there are some prior conditions (restrictions).

Figure 2 : How to cook stew



- It should be ready in time for the meal.
- It has to be satisfactory to all her family.
- cost for materials/ingredients should be within budget.

In other words, when she cooks only a cup of stew, there are three factors to think about before finishing cooking the stew. These three factors are:-

- Timing (the appointed time of delivery).
- The contents (quality).
- Expenses for making stew (cost).

These three conditions such as quality, cost, delivery, are exactly the same in the case that we produce something in a factory and we need to fill the conditions satisfactorily. In order to do that, we have to arrange and coordinate the following four items and make good products:-

Materials  
Machine  
Man  
Method of working

The above mentioned four factors are called "4 M".

## 2.2 Management is essential to run well

When we produce something in a field or factory it is not as easy as making stew, but many factors and problems invade our operation. In order to go on smoothly with productive activities, we have to put together workers, materials, machines and equipment; then arrange them and make productive plan - execute efficiently the plan in every section. In addition to that, we need to check if there is waste, uneven in each section. This series of activities is called "productivity management".

The series of works when we grow plants in the field are as follows:

Collecting seeds → production of seedlings → land clearance →  
planting → tending → forest → selling (get income).

This series of works should be connected well between each process, otherwise works would not progress well effectively. In addition to that, our works have the difficulty of being influenced by natural conditions such as weather, rainfall, temperature, soil and geographical feature.

Therefore we need management that makes a good plan, checks the situation of progress of the work and makes a countermeasure if needed, then tend to progress the activities towards a favourable condition.

Generally speaking, the items of management in the productive site are as follows:

- Management of manpower (personnel placement, absence situation).
- Operational control (an amount of products, the way of operation, quality).
- Control of appointed time of delivery (when it should be ready).
- Control of materials and parts (what are to be purchased, time, amount, and quality).
- Cost management.
- Measurement of unusual situation.
- Control of facilities (checking, maintenance, repairing).
- Guidance and training of subordinates (on the job training, others).

## 2.3 Make a productive plan

The most important item is making a plan in order to go on smoothly with "the cycle of management".

We have to make a plan along the purpose of the business and we have to manage works to suit with the plan. Also, the plan should be specific and practicable. The plan that is ideal too much and seems not practicable is not useful for management.

When we are going to make a good plan, we should use "5 W 1 H"; that is:-

When	:	When it should be started and finished.
Where	:	Where it is carried out (place).
Who	:	Who carries on the work (project) - man, machine.
What	:	What is needed to produce (material, equipment).
Why	:	Why they are made (so prematurely) - for what purpose are they made?
How	:	How it should be progressed (operation, process)?

### 2.3.1 Why should we make a productive plan?

A productive plan is, in short, a process of flow chart of time showing when, where (section), who, what and how much of a product we should produce. That is to say a standard or criterion that we are going to produce something based on the plan on every process in a working field or a factory.

Therefore, if a productive plan was not made up or carelessly made up, the following process has to be shifted the loss, in certain sections where there occurs unreasonable operation or wasteful over-production of products.

### 2.3.2 Productive plan classified by term

Productive plan is generally classified as:-

- (a) long term plan (productive plan for long term).
- (b) middle term plan (monthly productive plan).
- (c) short term plan (weekly productive plan).

(a) Productive (work) plan for long term (long term plan)

This is a long term productive plan such as a half year or a year plan, which is usually described as a flow chart of monthly activities and an amount of production. We should make a plan even if the plan is a little rough and inaccurate i.e. we correct the plan on the monthly plan checking through activities. For examples:-

Figure 3: Silviculture Annual Working Plan (in Kinarut).

Working items	Month Area (ha.)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Remarks
		Site preparation**	plan 100			30	20			30	20			
	result			[25]	[20]	[5]								
(Felling)	plan 100	30	20			30	20							
(Burning)	plan 100			50				50						
(Reburning)	plan 100			30	20			30	20					
Planting**	plan 100					20	10	10		25	20	15		
	result					[21]								
(lining)					20	10	10		25	20	15			
Weeding (with singling)	plan 200				20	20	30	30	20	20	20	20	20	
	result				[20]	[18]								
Improvement cutting	plan 100	35	35	30										do adjusting) other process
	result	[37]	[30]	[20]										
Pruning and thinning	plan 40	10	20	10										
	result	[13]	[20]	[5]										
Investigation														

\*\* Contractor work

Notes:

1. This is a planting sample (the field is a secondary forest).
2. All works of site preparation and planting, part of weeding and improvement cutting are supposed to be done by contractor.
3. Weeding is mainly done in rainy season, improvement cutting is done in dry season.
4. Pruning and thinning are done in dry season.
5. At the first weeding, trimming against double leader (multi-leader) is supposed to be conducted.
6. Many kinds of investigation in the test plot are conducted twice a year before rainy season.

Figure 4: Long term plan (1991)

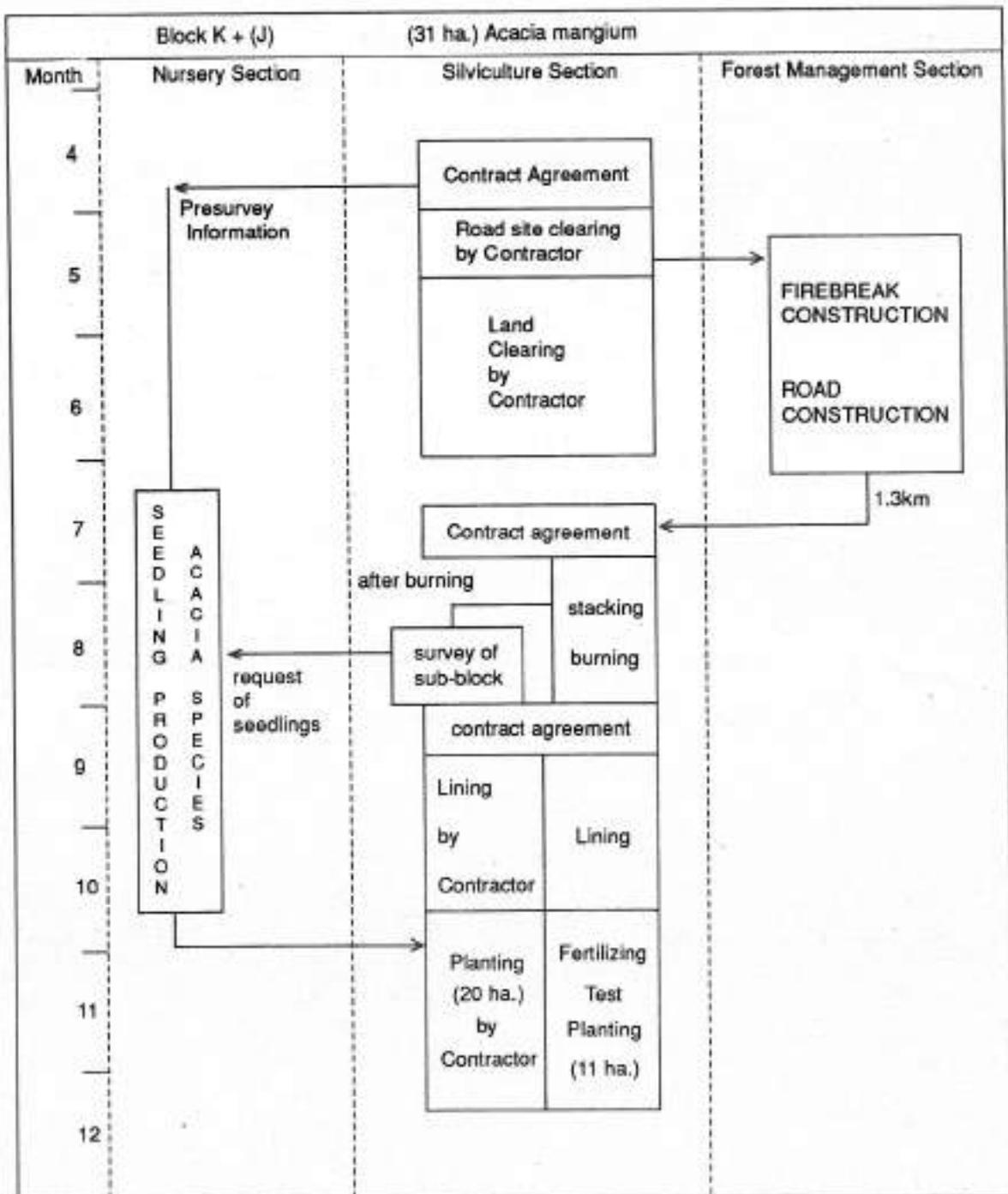


Figure 4 is one example of a long term plan. We can understand the activities related with other sections. This shows the flow chart of the works, which means silviculture works are closely connected with road construction and also with nursery section. We can understand on the chart when the activities should start and finish, so each section should have communication and cooperation towards the same purpose "effective planting".

(b) Monthly productive (working) plan

This is a plan described as what and how much of a product is made in a month and the preparation will be implemented well according to the plan. In case of forestry, we describe what kind of works, how much works we are going to carry out and how many workers are needed (including contract works). Of course we should decide when we start to carry on and what we should prepare for the works.

Figure 5: Monthly plan on Nursery (April)

Items and kind	Days	5	10	15	20	25	31	Remarks
A. Collect seeds ( <i>Pterocarpus indicus</i> )  ( <i>Acacia mangium</i> )			3kg (3)				2kg (4)	Next month sowing. From K. K. Capsule Weight Next month sowing. From K. K.
B Sowing ( <i>Swietenia macrophylla</i> ) ( <i>Acacia mangium</i> )		1.5kg (3)		300g (3)				
C. Potting  (4" x 6")  (3" x 8")			4,000 pots (4)	2,500 pots (2)				
				3,000 pots (2)	15,000 pots (10)			
D. Pricking ( <i>Acacia mangium</i> )  ( <i>Swietenia macrophylla</i> )					18,000 pots (7)		6,000 pots (5)	
E Tending (Weeding)  (Rearranging)  (Weeding)		<12> (5)	<12> (5)	<10> (3)	<10>	<7>	<7>	Every morning (8.00 - 9.00) Eucalyptus spp. Gmelina arborea
F. Trial (Cutting)  (Shading rate)					(2)		(1)	CPT 1,3,4 and 7 About three types
G. Dispatch other section (Silviculture)  (Forest Management)				(2)				CPT selection at Ulu Kukul Pinus sp. (borealis)
# No. of nursery workers		(12)	(12)	(10)	(12)	(7)	(10)	
# No. of total workers		12	12	12	12	(5) 12	(2) 12	

Note: < > = Does not include no. of workers  
( ) = Number of workers being engaged in each item

(c) Weekly plan (short term plan)

This is a plan to allot each productive process to its workshop and workers, and designate starting time and completion time. Even though we make a productive plan there might be a case where we can not go on with the plan smoothly because of unexpected trouble, a delay of materials or workers' absence.

When such a situation occurs, we have to coordinate a delay between work processes, and it is most important that we analyse why such situation happens and make out a countermeasure against the problem. Especially if the situation which occurs concerns other processes, other sections and contract works, then a prior discussion should be held with those concerned before implementing or carrying on with the work in order not to waste time and cost management.

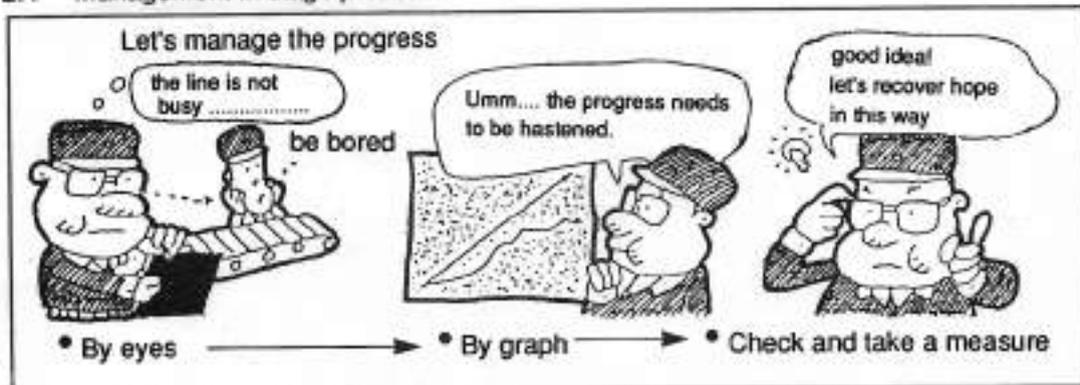
For example; when we need 5,000 pieces of seedlings for replanting, workers work hard and produce 8,000 seedlings.

Even though workers make an effort to produce good seedlings, this is not good management; i.e. wastefulness of over production brought up in our activities. If we pour the working power used in vain into a useful working process or other works, we could get a better result.

In making a plan we prepare basic materials such as:-

1. What kind of process we should plan. A working standard per person (worker).
2. How many days it takes for the work to be completed. a standard days per person.
3. What materials are used for production. How many days it takes to get materials, especially in case of placing an order outside. We have to confirm the possibility of acquisition and the days for acquisition.

#### 2.4 Management in stage process

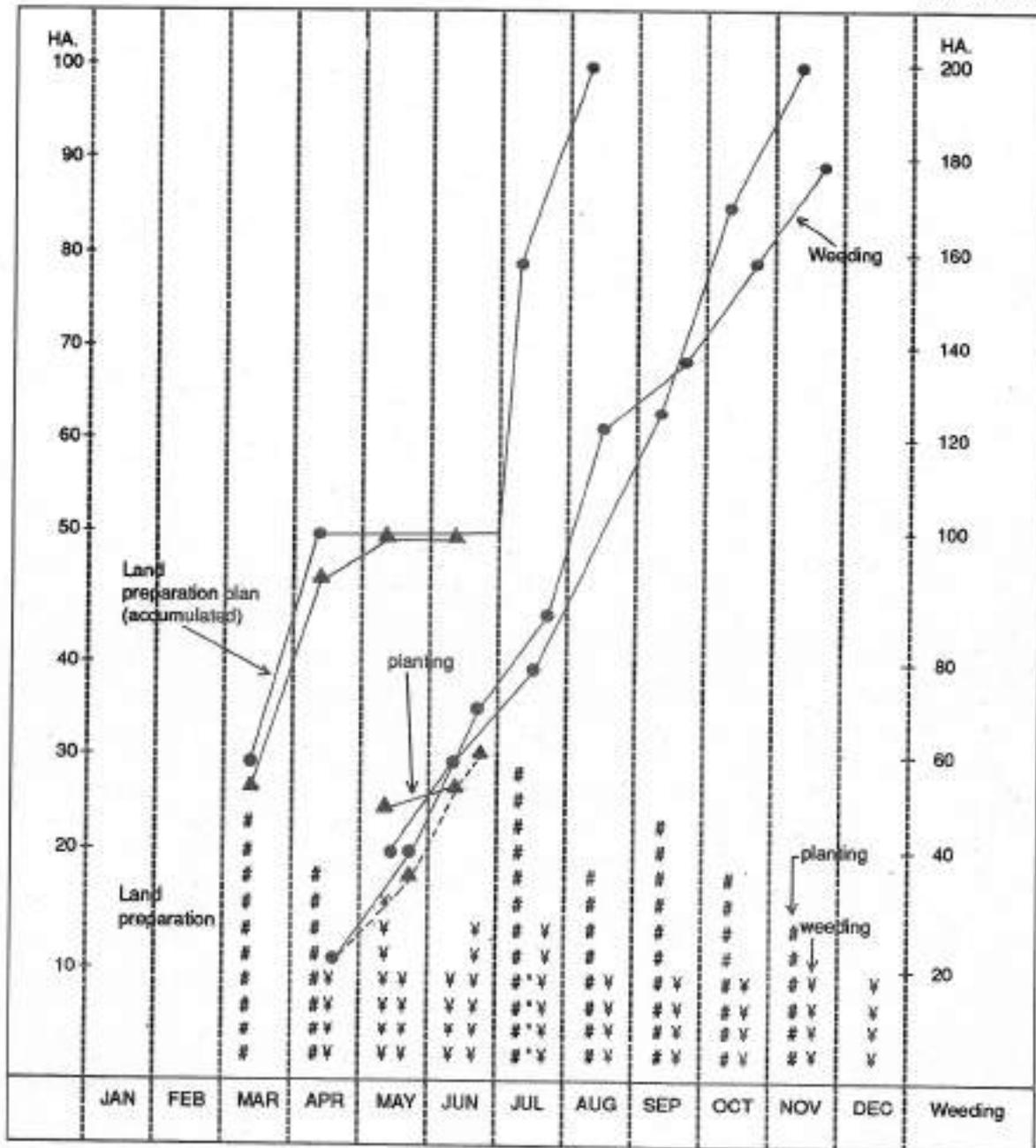


We have to check whether or not each process of the productive plan is being carried out as scheduled and if it is delayed we take a countermeasure against it and manage the process program to go on with the plan. The management is called "the progress control". Figure 6 shows such example in plantation schedule.

Figure 6: "The progress control" in a plantation schedule.

ANNUAL WORKING PLAN AND PROGRESS CONTROL (1991)

(In Kinarut)



## 2.5 Indexes forecasting productivity.

$$\text{Productivity} = \frac{\text{output}}{\text{input}}$$

Productivity means a measure for judgement on how efficiently we can carry out the product.

We generally input three factors for a product i.e. raw materials, production facilities, and labour power; so that we can see the respective productivity.

$$\text{productivity of materials} = \frac{\text{production}}{\text{consumption of materials}}$$

$$\text{Productivity of facilities} = \frac{\text{production}}{\text{number of machines}} \text{ or}$$

$$= \frac{\text{production}}{\text{operating time of machine}}$$

$$\text{labour productivity} = \frac{\text{production}}{\text{number of workers}}$$

When we want to know whether or not each machine and each process is running well the following indexes are useful.

$$\text{yield rate} = \frac{\text{finished goods}}{\text{consumption of materials}}$$

(An example):

$$\text{yield rate of grown-up seedlings} = \frac{\text{number of grown-up seedlings}}{\text{number of potted seedlings}}$$

$$\text{the operating rate of machine} = \frac{\text{number of days really operated}}{\text{number of standard operating days}}$$

## 2.6 Observable management in a site

Especially in a site, it is very important for workers concerned to have an understanding of the progress of production and the situation of arrangement of tools, equipment and unfinished products.

The following check list shows an example. We should have a check list checked every day or on regular days by watching the graph, figure described good arrangement and good order, a delayed situation of progress and the number of worked days of the machine (or no operation days by a breakdown and other reason).

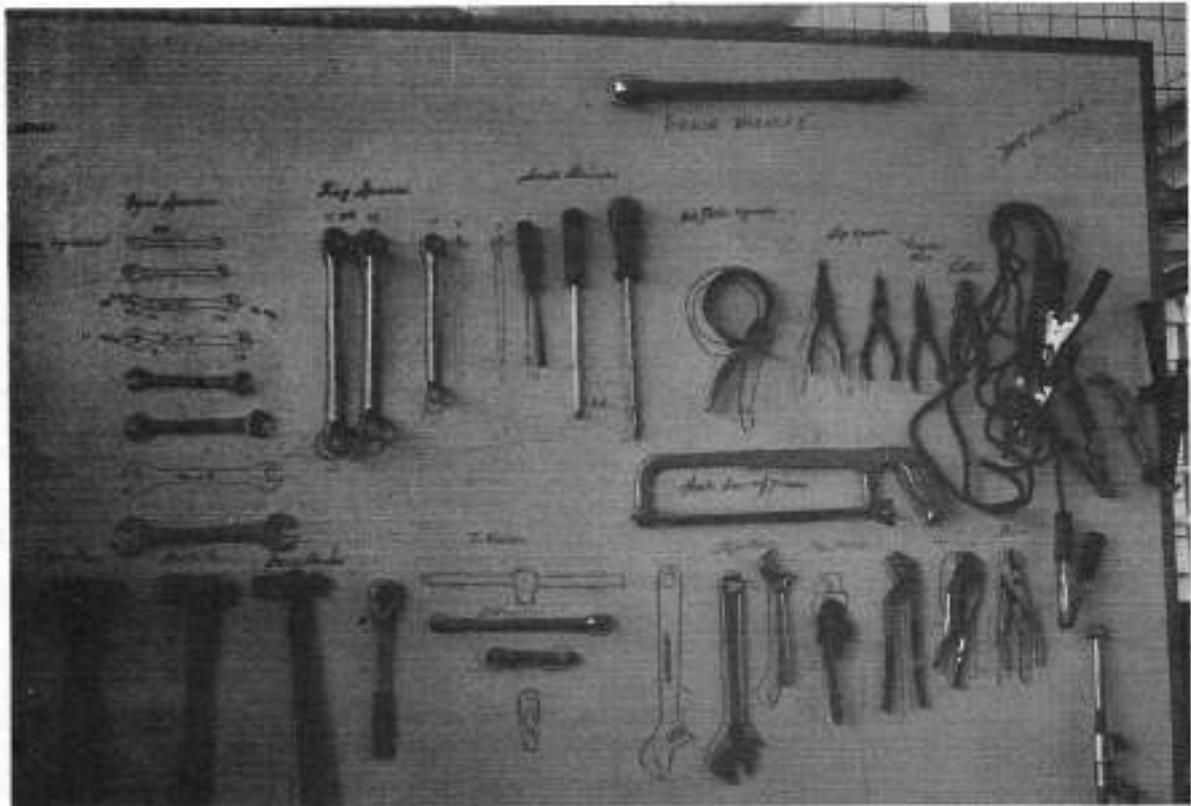
Figure 7: Check-list on visible management.  
 <for example> The checklist of the visible management.

Name in checking ( )  
 Check date ( ) site name ( )

Check Items			Practice		Visible equipment method for management	Executing time	Remarks
			yes	no			
Working environment	Is the arrangement and good order in the site (office) good enough?	Unfinished work yard. Disused stock yard Smoking area			Clear statement of unfinished work yard. Clear statement of disused yard. Set up the smoking area		
	Is the control and disposition of material and tools good?	Material stock yard. Tools control			Clear statement of material stock yard. A board drawn a shade of tools		A board for preventing lost tools.
Management of appointed time of delivery.	What is the result of production?	Compare result with plan.			A management board for production. A production program		
	Is there a delay of parts' delivery	Date of delivery of parts.			The table written the limit of delivery date (main parts)		
Quality control	Understand the cause of inferior product?	Item by item. Cause by cause.			A characteristic chart factor.		
	How many inferior products?	Inferior product stock yard. Inferior Checking list			Indication of inferior goods.		
	Is there an information system when abnormal thing happens?						Fungus insect damage.
Operation control	Is the operation done as the standard?	Manual			The manual of the work (a standard).		
	Absent worker (s) in site are grasped?	Labour plan.			Personnel placement board.		
Others	What is the cause of stopping machine (vehicle)?	Indication of the cause of the stopping.			Notice board		
	The stock of (products) materials, parts are known?	Indication of almost or proper stocks					
	Is there any tools out of order?	Indication of tools being needed to prepare.					Indicate the limit of being repaired.

If the tools are not on the shadow, we can easily see that they are lost. We can then look for them or, in the final event, replace them.

Figure 8: A shadow picture of tools.



### 3. IMPROVING PRODUCTIVITY ACTIVITY

#### 3.1 What is an improvement of work?

An improvement of work is defined as the work we are now carrying out easily, well, speedily, reasonably (cheap) and safely in the implementation.

There is certainly much room for improvement in our work. We have to check the way of our present activities; why we carry on with the activity; and whether or not there is an alternative method, then improve our activities to get above mentioned factors.

Improvement will be connected in short with becoming good for workers and useful for management.

→ a goal of improvement ←	
easily	: decreasing tiredness, getting skill easily.
well	: maintaining and improving quality.
speedily	: shortening time (of production).
reasonably (cheap)	: decreasing cost
safely	: preventing labour accident (decreasing compensation money for labour accident).

#### 3.2 Mental activities for carrying out of improvement.

##### (1) Have positively a critical mind!

It is very important for us to watch things against existing conditions through the eyes that have a critical mind as to whether or not the present state is favourable.

If we have a critical mind (i.e. is there a way of carrying on more easily? Can we carry on more speedily?) we will be able to find a resolution measure.

##### (2) Try to implement even tiny things

If we have a mind that there is no use in improving only tiny things, we can not proceed with the situation any more. Even if they are very tiny things, they go on accumulating and bring accumulative effects.

If a person wasted only one pencil and five pieces of copying paper, lost money is estimated at about M\$335 if 500 persons do that.

- (3) We should carry out the activities according to our own mind instead of by the order.

At first we should think about the problem in our section by ourselves. If the problem to be improved is pointed out by other people or another section, we sometimes have a mind - "Don't find fault with our section". The first consideration is that we check the way of working and think about improvement of the work by ourselves in our own field.

### 3.3 How to proceed with improvement of our activities

A basic arrangement for proceeding with improvement is carried on by 7 steps as shown in figure 9.

- First step : grasp problems (in a work).
- Second step : establish the goal of improvement.
- Third step : analyse the goal of improvement.
- Fourth step : think over a measure for improvement.
- Fifth step : carry out the improvement plan.
- Sixth step : evaluate the result of improvement.

(If we have unsatisfactory result at this step, we have to step back to the fourth or the third step and think over again. Then we can get the expected result).

Seventh step: put on the brakes (not to be run off the measure and try to fix the control).

After the above 7 steps have been carried out as one cycle, our works are improved and placed in good management. In order to improve to higher level, we go on with the improvement step by step from first step "grasp problems".

I have written a bit more specifically about how to proceed with improvement in every step.

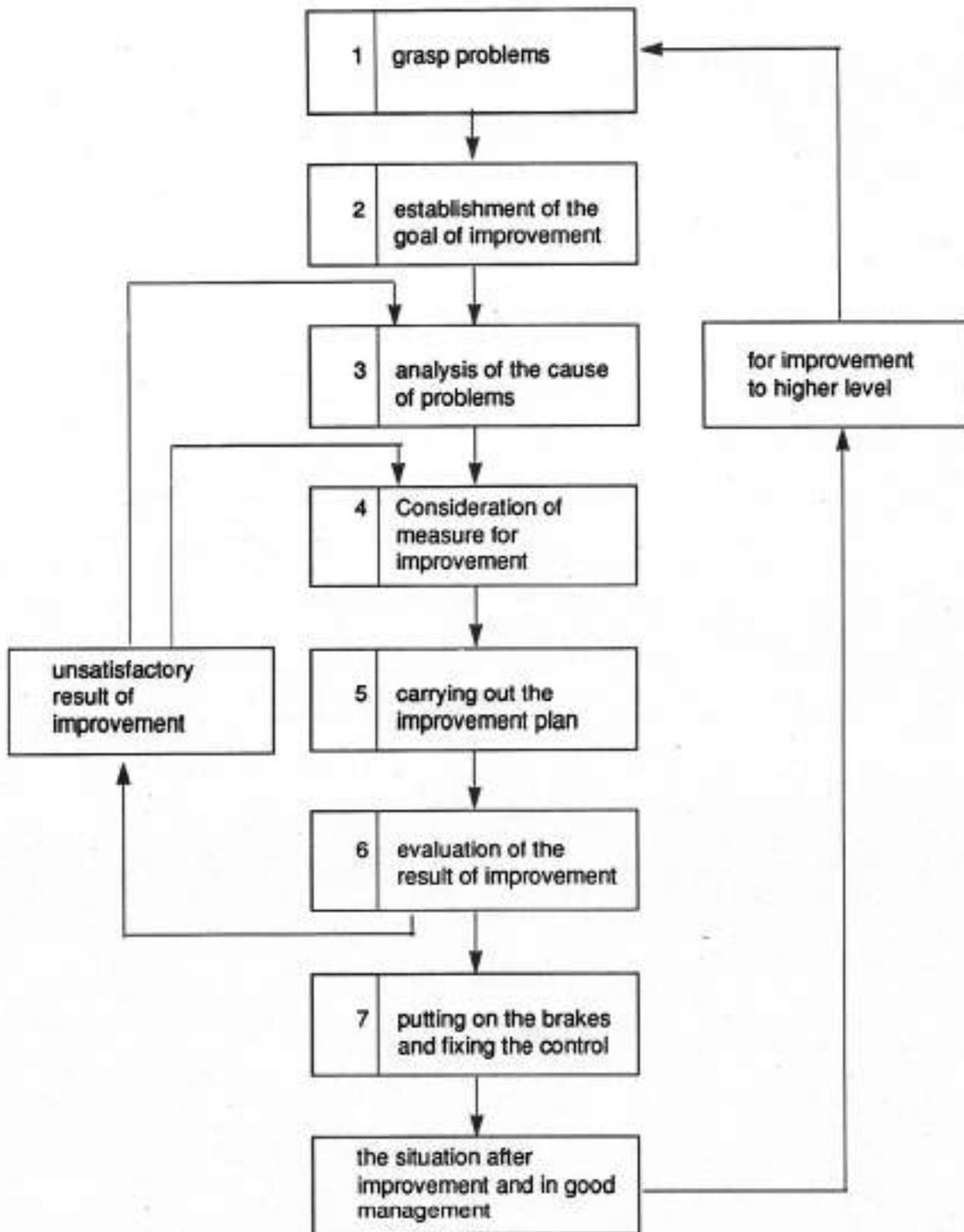
#### 3.3.1 Grasp problems (in a work)

In this step we are going to grasp firmly what the problems are and why they exist.

- (1) Check the problems according to the policy and goal of the company (office, section).

In order to check our work and find where the problems are, we recognise the policy and goal to which we are working and we have to check based on them. Generally speaking "policy" defines the direction to go on and a plan to be carried out in words. "A goal" means the result to be reached described in figures.

Figure 9: 7 steps of proceeding improvement cycle.



In order to complete the policy and the goal through the organisation activities, each person has to recognise clearly his/her responsibility - what they should do in their section and in their post. Then they have to make their own duty well known to their men. A critical mind will issue from comparing the existing situation with the policy and goal.

(2) Utilise the problems' checklist.

For picking up problems widely and looking into them it is very effective without overlooking to utilise the checklist listing the points aimed for improvement.

As for checklist, there are some viewing points:-

(a) Pay attention to "4 M" i.e. 4 factors on production.

→ 4 M ←		
1.	Material	: are there problems about material?
2.	Machine	: are there problems about machine?
3.	Man	: are there problems about man?
4.	Method	: are there problems about method?

(b) Pay attention to "3 U" i.e. check unfavourable appearance in our activities or workshop along the following "3 U".

→ 3 U ←		
1.	Unreasonable	: are there unreasonable activities or facilities?
2.	Uneven	: is there uneven flow in our work?
3.	Useless	: are there useless (wasteful) activities?

For reference the checklist connected by "4 M" and "3 U" is shown in the following figure 10.

Figure 10: The checklist connected by 4 M and 3 U.

3U 4 M		unreasonable	uneven	useless (wasteful)
Material	# raw material	Isn't the raw material unreasonable?	Isn't the raw material uneven?	Isn't the raw material useless?
	# duplicate material	?	?	?
	# stock uncompleted product	?	?	?
	# stock yard	?	?	?
Machine	# machine equipment	?	?	?
	# installation	?	?	?
	# tools	?	?	?
Workers	# workers placement	?	?	?
	# their skill	?	?	?
	# operation efficiency	?	?	?
	# training (on the job training)	?	?	?
Method	# working method	?	?	?
	# standard time	?	?	?
	# safety equipment	?	?	?
	# working environment	?	?	?

(c) Pay attention to each item as below:

Generally speaking, the results of our work are expected to satisfy the following items. Therefore, we check each item and seize problems.

6 checked items - are there problems?	
1. Quality	4. Productivity
2. Cost	5. Safety
3. Delivery	6. Morale

When we have checked these items, we then compare with our works (for example):-

Quality : the health of seedlings, size,  
 T - R rate  $\left( \frac{\text{tree weight}}{\text{root weight}} \right)$

Cost	:	Cost per seedling, cost for cash process of work, plantation cost per hectare, road construction cost per meter, overhead cost.
Delivery	:	Is the seedling produced in time as scheduled? Are the processes such as land clearance, plantation and slashing ready as scheduled?
Productivity	:	Labour productivity, the working ratio of machine.
Safety	:	A shutdown of operation by injuries (an absence days by injuries), wage compensation. Are there any other problems for maintaining security?
Morale	:	A workshop with high morale will be good for proceeding with the above-mentioned items. After discussing freely why morale is low and what makes it low, then we pick up problems and try to improve them.

### 3.3.2 Cause Analysis

Usually there are not one or two, but many factors that influence the result of our work. At first it is better to pick up all the causes that come into our head. As one of the methods, we often utilize that so called "brain storming method".

When we have a brain storming method, it is better to have our colleagues who wrestle with improvement problems; cooperation and : other persons in different positions join in the meeting and discuss the cause from various points.

Finally, it is very easy to understand that we classify and put the causes in order systematically into the figure of characteristic factor chart such as the following figure 11.

There are WHY type and HOW type in the characteristic factor chart.

#### (1) WHY type

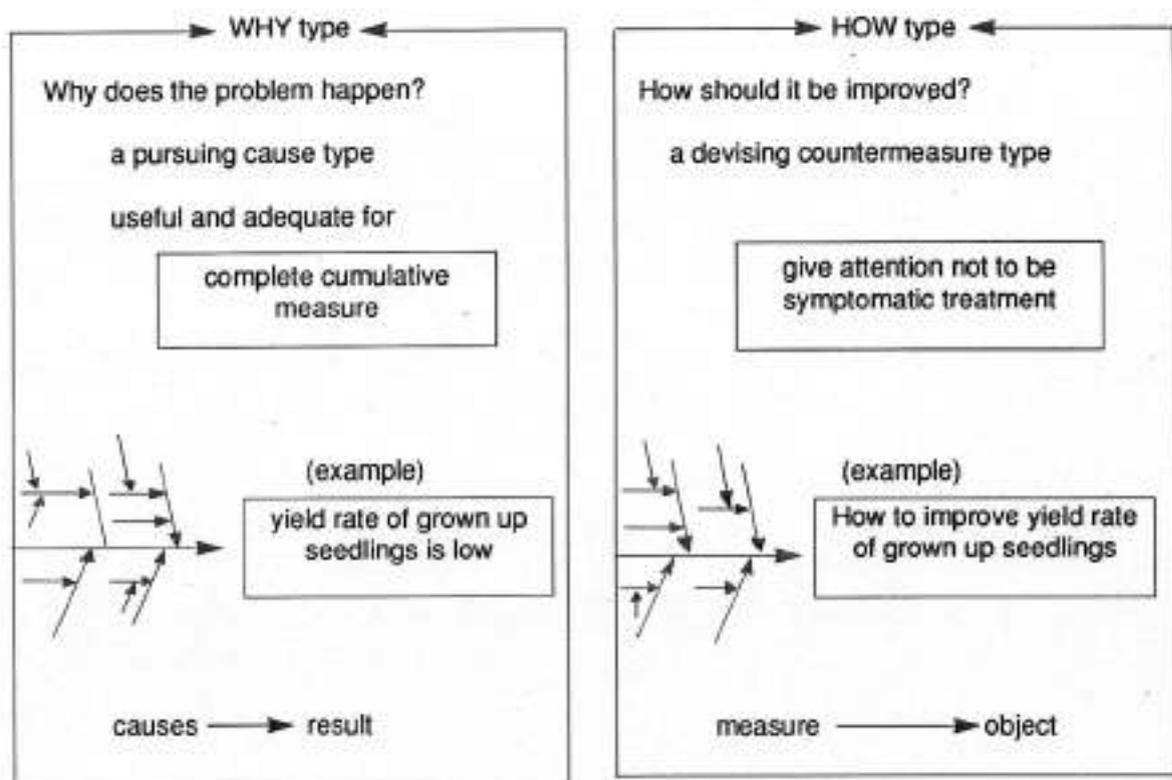
We pick up satisfactory situations or phenomena that we are now bringing forward as factors in the characteristic chart, and we arrange the factors why the problems occur. Then we sort out the factors systematically into a big bone, a medium bone and a small bone. That is called the pursuit type of the cause.

(2) HOW type

In order to dissolve the problems we feel need to be improved, HOW should we go on with them? We describe the expected goal or situation on the head of fish bone and arrange and put it in order / effective measure as we think it should be. That is called the type of considering measure.

In order to make up a counterplan that is radical and makes it hard for the problem to re-occur, we should pursue cause and furthermore pursue the cause by using WHY type.

Figure 11:



HOW type is useful for considering the method and countermeasures achieving the purpose in advanced stage, but it is in danger of running often to a symptomatic treatment without enough resolution of causes.

It is extremely important that we examine thoroughly using "WHY type" in a stage of analysing causes.

### 3.3.3 CONSIDERATION OF IMPROVEMENT MEASURE

#### (1) Method of giving birth to idea.

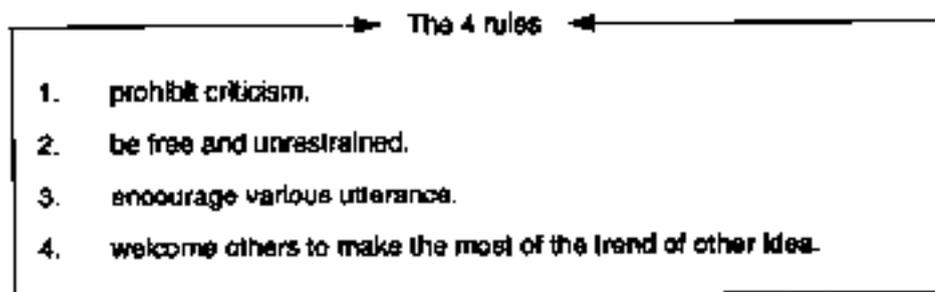
There are various excellent methods developed that enrich our ideas, draw ideas out of our brain, raise and develop ideas.

Here, I would like to introduce the "brain storming method" and the rule on raising ideas.

#### A. Brain storming

This is one of the good methods where we propose our ideas freely to each other in a group and we make a chain reaction on ideas into a better idea.

This method is advocated as one of the ways of meeting by ALEX OZUBORN in America, and characteristic of this method is to keep the following 4 rules going in the meeting.



#### 1. Prohibit criticism

Nobody should criticise good or not against the proposed idea, because a participant may get tired of proposing his idea if it is criticised. Furthermore other participants will not suggest their ideas.

#### 2. Be free and unrestrained.

We propose free and unrestrained ideas without sticking to the present situation and common sense, then pick up any unusual opinions and ideas. Creative ideas bear from novel ideas that get out of fixed idea.

#### 3. Encourage various utterance.

The more utterance, the better. The more ideas that are brought up, the more

possibility that high quality ideas will bear, i.e. "a large quantity brings forth quality".

4. Welcome others to make the most of the trend of other ideas.

Welcome now ideas by making the most of the trend of other person's idea. The new idea means that for example we associate another idea from original one; extend or expend the proposed idea and coordinate other idea; then developed a new idea.

How to hold a brain storming meeting effectively.

- a. Number of participants suitable is 5 - 10 persons.
- b. Time for meeting is expected around 1 hour, not good for too long.
- c. Members should include not only colleagues who are tackling improvement but other staff whom we want to get their cooperation in a practical stage if necessary.
- d. A leader and a secretary are nominated, the meeting should go on under the chairmanship of the leader along the above-mentioned 4 rules.

A secretary briefs pertinently many proposed ideas and writes down on a large paper or (black) board.

Ideas proposed should be classified and arranged according to content; then will be itemized or arranged as the characteristic factor chart using "HOW type".

- B. A rule of thinking idea.

Alex Ozuborn who advocated the brain-storming method worked out the checklist method. He prepared various questions in advance for drawing out ideas and considered for each question.

As there are many-sided questions in the method for raising ideas, it is very useful for us to draw ideas easily and systematically to some extent.

There are 75 questions in the method, but now the following 12 items that were reduced and systematized are usually utilised as "the rules of idea".

→ Rules of idea ←

1. how about stopping?
2. how about reversing?
3. is it normal or abnormal?
4. how about dealing with only exceptions (not regular)?
5. how about enlarging or minimizing?
6. how about connecting or separating?
7. how about unifying or dividing?
8. how about adding or striking out?
9. how about reconstructing?
10. how about making the best use of differences?
11. how about using in other section or changing?
12. how about doing at the same time or in regular order?



(2) Elaborate idea to practice plan.

Ideas proposed do not constitute a counterplan. We have to select them with care, choose them for the purpose and combine them in order to work out a practical measure plan. It is better to work out at least two countermeasures, then evaluate the plan from the following aspect and at last decide the best practical plan.

# economic efficiency:

Is there any expense needed for improvement?  
How much will the profit be obtained by improvement (cost reduction) ?

# technology aspect:

Will the problem proposed resolve essentially?  
Is there any secondary effect in quality or in safety brought up?

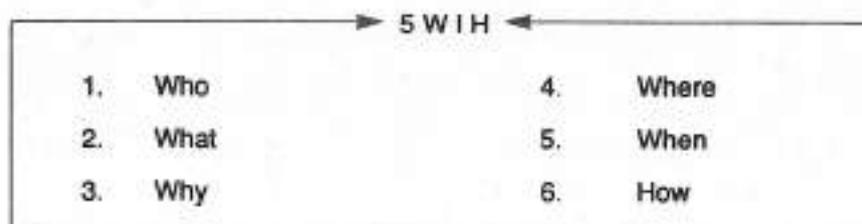
# operation:

Are there problems in skill or number of processes brought up in the practical workshop?

Are there any problems which occur before or after the process?

(3) Complete a plan for carrying out.

When we are going to put the improving plan into practice by group, it is necessary to confirm the person in charge, clarify " 5 W I H " and decide a day's schedule of implementation.



3.3.4 Carry out the improvement plan.

Prior to the implementation, we have to fully explain the plan to the superior and the persons concerned and ask their cooperation in carrying out the plan.

In case of needing some budget for the implementation, of course we have to take proceedings in getting the agreement of the person concerned.

Even if the person concerned understands the need of improvement in their mind, it is a human being's habit that they stick to the present way of doing; they show RESISTANCE against CHANGE and REPULSION against NEW. We often meet a situation "Agree with general remarks but opposed to details".

So it is very important to explain well the main point and contents of improvement to the persons concerned especially to the superior, then get their understanding and cooperation.



### 3.3.5 Evaluation of the implementation.

In this step we check if we can get the result as scheduled; then evaluate the result and confirm the effectiveness of improvement.

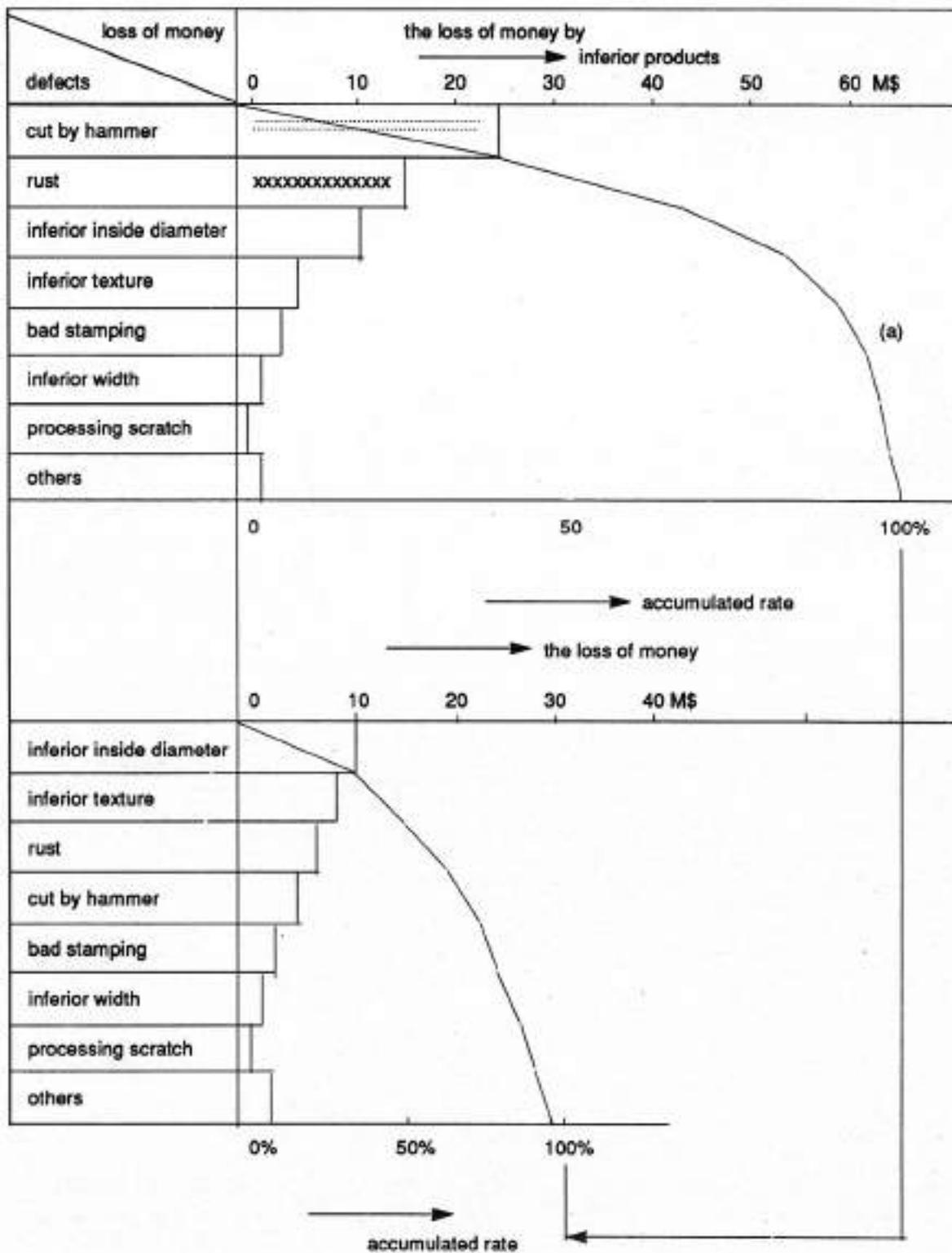
<< The standard of evaluation is the improvement target that we establish at first. >>

We evaluate basically the result of improvement by the basis of improvement target we have already established i.e. the target described with three factors "What", "How much", "by When".

It is better to indicate or show by figure or chart how much we can attain the target through the result data - comparing the data before and after improvement.

Here is an example of a parts maker.

Figure 13: The comparison of result before and after improvement.



As (b) shows, after taking the measurement, the rate of defective composition changed and the loss of money caused by inferior goods reduced by half, especially cut by hammer and rust were placed below third. This shows the effect of improvement through the management of priority method.

When we introduce an improvement method, we often do not feel it at first to be easy to carry on because of inexperience and it is easy to go back to former system unconsciously. It is very important for us that we try to carry on what we have thought good and we have to analyse and evaluate the result, then we should try to improve more if there are any problems in the process. We have to make an effort to turn this management cycle again and get firmly fixed with this system.

#### **4. IMPROVEMENT OF THE MANAGEMENT**

##### **4.1 We should have the measure that can check the effect.**

How do you go on with your work?

In order to be able to answer the question precisely, we have to have a measure that estimates the result of implementation, i.e. the effect of our productive activity.

Generally speaking, a superior manager is used to making good use of the estimated general evaluation or the proportional valuation such as the percent of progress. But in a field or factory it is easier to judge the situation using live data rather than the rate of general valuation, and we are also to take actions.

For example, in our plantation activity it is more specific to say that the delay of practice carried out in this month is 20 ha. rather than the delay which is 15%. We can easily estimate that the delay of 20 ha. plantation is equivalent to 7 days work, which helps us to work a countermeasure.

##### **4.2 The standard of evaluation.**

What should we compare the result with to evaluate whether the result is satisfactory or not?

##### **4.2(a) Compare with the past records.**

We can see the change of situation by comparing the record with the past records if the business is inclined to decrease gradually or it has a trend of upgrading because of the effect of improvement and countermeasure.

4.2(b) Compare with other sections of the same department.

We can see a relative different compared with the other lines dealing with same products or other sections in competing rival.

4.2(c) Compare with the goal.

It is basically desirable to evaluate the goal to be planned on purpose. The goal is sometimes planned ideally; for example the target is ZERO for preventing accident. But usually it is more practical to establish the goal through consideration of the trend of past showing or data on other sections of the same department. We evaluate the result of our own work compared with the goal already established and we have to feedback the activities on our own judgement, then evaluate the management activity.

Usually at first, we manage to get a better result compared with the past showing. Next we make an effort to reach the goal planned being higher than before, finally we have to aim to produce a better one compared with the same work or same products in other companies that are related to competition. Otherwise our company can not go on as an enterprise.

4.3 Check the way of checking.

4.3(a) It is not good to "ought to be done or be expected to be done".

We sometimes say unconsciously "it can not be done" or "it should have been done last week". The word "ought to" is only a guess and inference. One of the basis of field management is called "the management based on the actual fact". Superior or supervisor should decide and act on the base of fact that he has checked and confirmed by himself. Data of course shows a part of the fact, but it tops everything for him to check and confirm a matter and a fact by himself in the job site.

4.3(b) Check at the job site

It is of course important to contrive what kind of data and how much data we should get in order to clarify the truth or catch the true situation. But, there are many cases where we can not find out the truth even if we check and analyse the data. In this case we can often have a case to find out the truth when we check the products on our hand or look at and touch the products directly.

When a problem occurs, we always look deeply into the causes of the problem. In that case supervisor and staff are likely to gather at the meeting room with some data and discuss around the table. We should take care not to become estranged from the site because we do not like to soil our hands, we like desk work and to avoid the unrefined site. Especially in our forestry field it is very important to go to the field frequently, then

look and check with our own eyes.

It is also important to think out the method so that we can understand the situation by just looking at the scene whether the operation in site is going on well or not. For example, without checking the account book, through the accumulated situation of incomplete products, the working situation of the facilities and the progress of the result compared for the plan. We can understand by seeing the site and through some simple signboard we can understand whether our work goes on well or not and where the problem is.

We should establish such better system and make good arrangement and good order for full understanding by all people concerned, which will make it easy for the supervisor to manage the job site.

## 5. TECHNIQUES OF IMPROVEMENT

I would like to put the techniques on improvement in more specific ways.

### 5.1 The base of management is to arrange and put goods and job site in good order.

Recently we often see that many factories or fields are developing the movement of proper arrangement and putting in order. "Arrangement" means to sort what we need or not, "putting in order" means to put goods or parts in proper line to make easy to pick up when we carry on the work or process. Therefore, it is better to sort out in 3 ways: (a) all the necessaries (b) no necessaries (c) not so necessary. Considering the width of factory space or effective utilization of working space, then we can realise "the real necessaries" clearly, so that we can choose easily whether to dispose of or keep. We would like to carry out from tomorrow "the base of management i.e. proper arrangement and putting in good order" for advancing the operation efficiently. For example one idea is that we make the check sheet as below (figure 14) and fill in the check data.

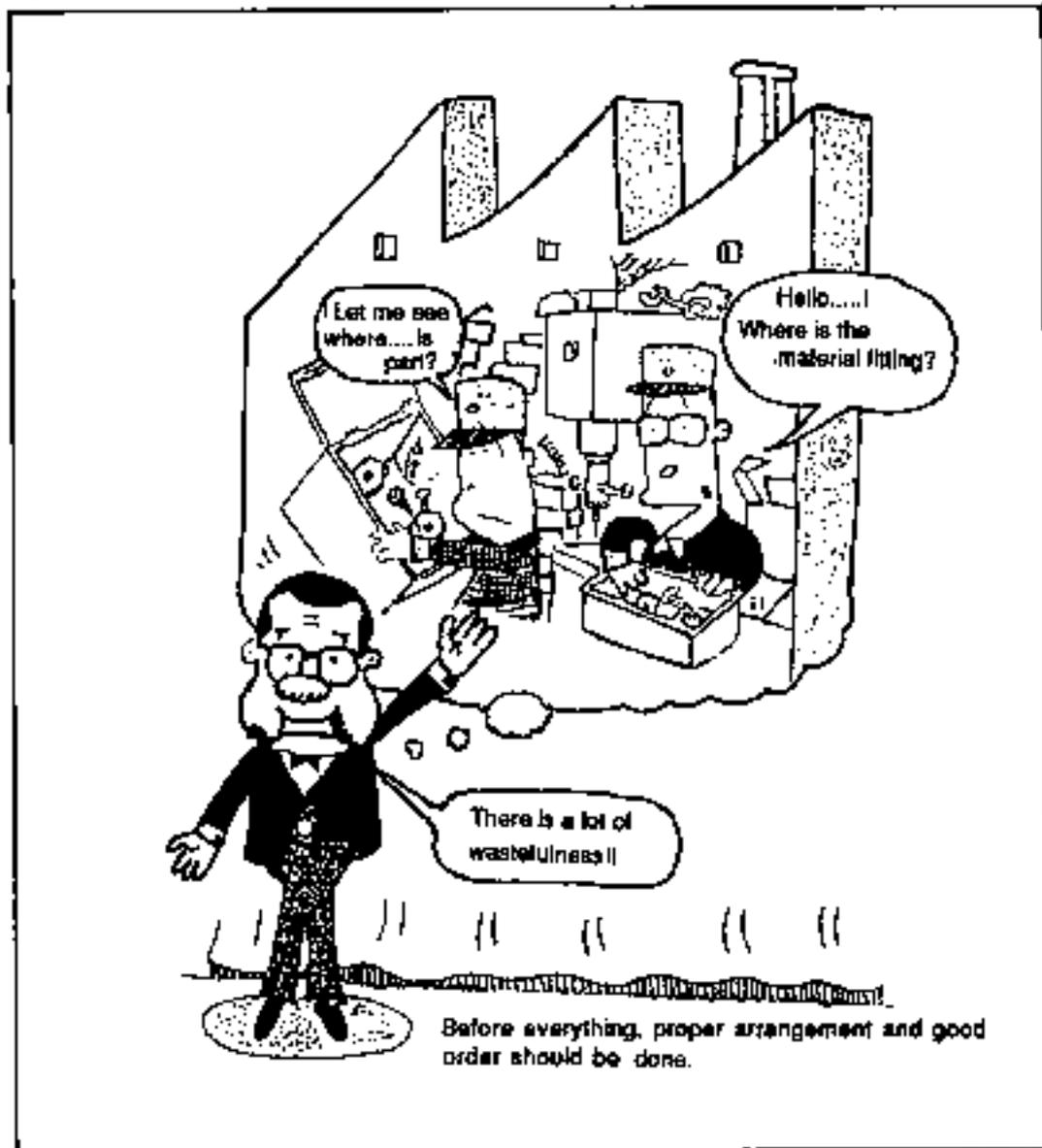
Figure 14: A checklist of arrangement and good order

Name of job site: _____							o good	o
Name of checker: _____							o fair	o
							o bad	x
Item	Checking matters	Date:					Remarks	
		17 Jun	24 Jun	01 Jul	08 Jul	15 Jul		
passage way	# Are there some goods to be easy to stumble?	o	o	o	o	x		
	# Are there inferior goods left on the passage way?	o	o	x	o	o		
job site (workshop) (office)	# Are there unnecessary goods on the work table?	o	o	o	o	o		
	# Are the toolshel and tools box in good arrangement?	o	o	x	o	o		
	# Are there materials or parts scattered?	o	o	o	o	o		
	# Is the workshop cleaned every day?	o	x	x	o	o		
	# Is there unnecessary equipment and tools in the workshop (office) ?	o	o	o	o	o	Training room	

It is very important to decide clearly on the check sheet who, when, where and how to be checked.

Also, it is very useful to fix the check date (for example: the first day of the month, the first Monday of the month) for getting firmly fixed to the check.

Figure 15



## 5.2 "5 W | H" (Pursue WHY? WHY?)

Getting rid of our prejudice, thinking better, looking at the job or operation through an objective view, having a question "why" every time we see something and someone, are very important to improve our ways of working.

Having the question "why" is the first step of improvement.

# 5 W 1 H method

		Question	Effect
What Why	for what? (purpose) necessity	# Why does it operate? # How does it go on without the operation? # Is there other thing that should be done?	# Elimination of the operation (process) # Simplification of the operation (process)
Where	(place)	# Why is it done at the place? # How about changing or integrating the place?	# Change the working process and the way of doing.  (combination) (rearrangement)
When	(order)	# Why is it done at that time? # When is the rational operation? # Can it be done in other time?	
Who	(person in-charge) (operator)	# Why is the person doing? # How about gathering or changing the worker?	
How	(method) (means)	# Why is it operating in that way? # Is there any other better way?	# Simplification of the operation

This "5 W 1 H" method is a simple and useful method in order to fully improve problems arising in the site.

The first "what, why" intend to confirm purpose and necessity.

The following "where" means a place; "when" means time and delivery time; "who" means person in charge and the last "how" means to confirm the method and means to improve.

# THE NECESSITY OF PURSUING "WHY? WHY?"

There can be no doubt of the importance of being accustomed to catch the figure of our activity through objective and critical observation: why? why? about the symptoms occurring in the field.

It is prejudice, subjectivity and selfishness, and the way of selfish viewing and self-interested thinking to brake the development of man's knowledge; speaking daringly it is the thought that the things carried on by his intention are exactly right.

It is known that man has sense of sight and hearing, experienced in his life and is

excellent in his knowledge but the knowledge has no guarantee to be fully right for advancing in a new way. The success of improvement might never be born from the attitude that the present way of working is reasonable or the view that he feels no question and no problem.

Generally speaking, the cause of failure of improvement in the site are thrown into three points:-

- (1) There is no knowledge on necessary technic.
- (2) They have the knowledge but remember in a wrong way.
- (3) The knowledge was right when they got it, but it was already out of date at the time needed.

If they do not have the knowledge and technic or remember the wrong ones, it shows a lack of study on that matter (subject).

#### # EFFECT?

When we adopt "the WHY? Why? method" there arise many improvement ideas one after another. As the outcome WHAT \* WHY \* can bear the effect of the elimination on the operation or process, WHERE \* WHEN \* WHO can bear change of the process and the way of doing (combination and rearrangement), HOW can bear the simplification on the operation.

#### # EMBODIMENT OF WHY \* WHY METHOD

##### 1. ELIMINATE

We can find the possibility of elimination through the thorough WHY? For WHAT? over by pursuing the purpose. This will lead us to the most improvement.

##### 2. COMBINE

We can get ideas combining some elements by answering the question: who? what? where? when?

In this result a lot of carriage and congestion between both elements will be reduced.

##### 3. REARRANGE

By answering the question "why? what? where? when?" we will be able to find out the replacement and the arrangement of order. This also might lead to the possibility of new elimination or combination.

##### 4. SIMPLIFY

After full consideration of elimination, combination and rearrangement, then we should try to simplify the elements left. In this case the question "WHY" is more useful.

The main aim is to reduce labour and expartness.

### 5.3 Find out the wasteful things (action, process) and get rid of them.

What kind of wasteful and useless things are there in our field?

Wasteful things make the production speed slower and make our production cost higher. So we have to continue to persevere in our efforts to find out and eliminate the wasteful things in our productivity actions.

There are many wasteful or useless works in our operation such as:-

- # The wastefulness or uselessness of over production.
- # The wastefulness or uselessness of waiting (next operation).
- # The wastefulness or uselessness of carrying (materials and products).
- # The wastefulness or uselessness of stocking.
- # The wastefulness and uselessness of action.
- # The wastefulness and uselessness of the processing itself.
- # The wastefulness and uselessness of making inferior goods.

This wastefulness usually happens, with a causal relation; for example the wastefulness of over-production bears the wastefulness of stocking, which bears the wastefulness of inferior goods. There are some cases where the improvement wastefulness of carrying work occurred the wastefulness of the stock, so we have to look into another essential causes and find out an effective measure.

In order to find the wastefulness we should check and establish the following items (already described in the above chapter but describe summary item again).

- # the thoroughness of arrangement and good order:  
We can find out the wastefulness by arrangement and good order in our field (or job site).
- # control against over proceeding (production):  
We have to control the process concerned and coordinate the relation between the sections or the process, then control the over proceeding (production).
- # understandable management by eyes:  
In order to make every body understand the wastefulness, the control board such as the chart which described the result compared with the plan is very useful in our field.
- # introduction of operation standard:  
Making an operation standard facilitates us to find out the wastefulness behind the work.

#### 5.4 Examples of specific improvement

There are some improvement examples quoted in some workshops.

The best technic for improvement is "CAN WE ELIMINATE (SOMETHING)?"

At some office:

<a staff> "We hand out this report to HQ every month but it is so detailed and troublesome to prepare. Is there any way to make it more simple?" <Head of the office> "We report it every month because of HQ's requirement. I think too it's better to be more simple".

↓  
(inquire to HQ)

<HQ> "We required the report because we needed it at that time but now we rarely use it".

⇓  
point

For what purpose are we doing this?

We have to rethink our operation along the purpose. Even if the purpose is only one there are usually some ways or methods to carry out.

→ CASE 1: HOW ABOUT ELIMINATING? ←

**CAN WE STOP THE ACTION OF PICKING UP?**

# A case of assembling line in some toy maker. In this line four workers are screwing with an electric screwdriver. Their actions are:-

1. Have a work (a kind of plate) coming with left hand.
2. With their right hand pick up a screw in a screw box and insert the screw into a hole.
3. Tighten the screw with right hand. Picking up a screw, insert the screw passing a screw driver from a screw.

All these actions are done with a right hand. These actions with right hand are troublesome and may take a certain time. Can they stop or reduce the action? The purpose of the action is fixing a screw on the work (the plate).



(improvement)

1. They devised a tip of the screwdriver into a magnet (figure 16).
2. Put screws through a screen that has the eyes being able to pass the thread of the screw into the hole but not passing the head of the screw.

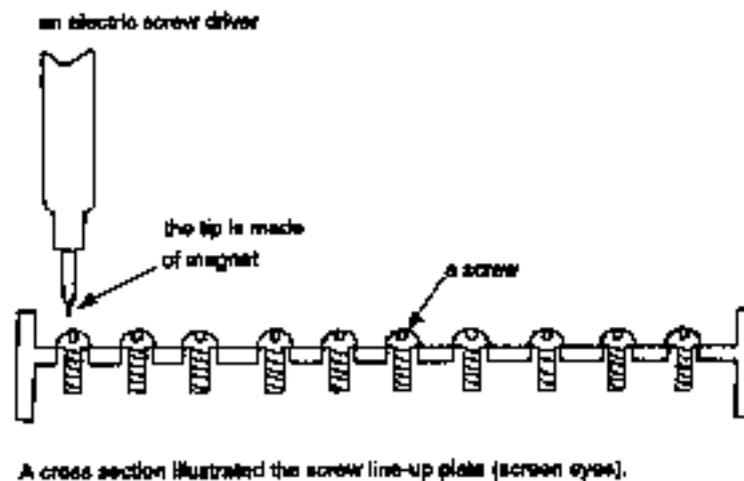


(then)

- (a) As figure 16 shows, only the heads of the screws line up on the screen.
- (b) Have the work with his left hand, have a screw driver with his right hand, then put the tip of the screwdriver vertically on the screw head that are lined on the surface of the screen.
- (c) The head of the screw is drawn to the tip of the screwdriver (with magnet tip).
- (d) Put the screw (being held with the screwdriver) into the hole of the work with the screwdriver and tighten.

At first they could not operate smoothly but after 3 days they could fix the screw twice as speedily as the former days.

Figure 18:



#quoted#

"The encyclopedia of the thorough improvement of workshop".

(The editorial department of "factory management").

← CASE 2: HOW ABOUT TURNING THE ACTION →

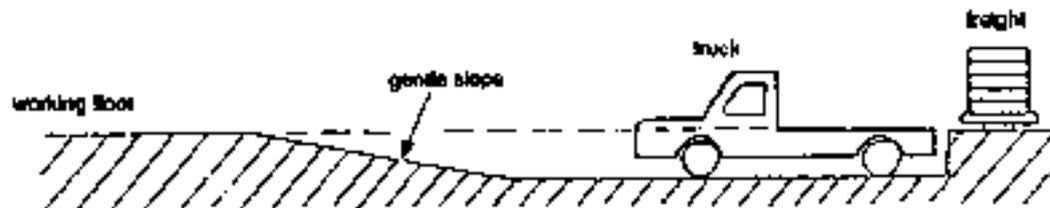
OR THE PROCESS THE OTHER WAY?

- A. In a factory where materials and products are often carried in and out, it needs a lot of labour power and time to put freight up and down on the bed of the trucks.

On the way of thinking that every floor in a plant should be flat, we can not eliminate these works.

But as figure 17 shows, if we bring down only the floor that truck stops at during loading and unloading to the height of truck's bed, we don't need forklift and can do the work easily and fast.

Figure 17:



An improved floor for the loading and unloading.

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quoted:

"The encyclopedia of the thorough improvement of workshop"

(The editorial department of "factory management")

- B. The chair of the dentist.

Dentists in former days used to have a patient on a fixed chair and treat him in an unnatural posture; stand for a long time; bend himself and bend down half way.

This is the way of thinking that the dentist's posture is adjusted to the position of the patient's teeth. In that way the dentist will not only get tired but can not treat the patient efficiently.



Many dentists nowadays adopt a reclining seat that they can adjust the height freely with just a button, then they treat the mouth of the patient on the reclining chair while they are still seating in their chairs.

This idea is the reverse way of thinking that the position of the patient is fixed to the doctor's position contrary to the former style.

→ CASE 3: HOW ABOUT COMBINING OR SEPARATING? ←

A. Idea of combination

In order to improve the way to be easier, more speedy cheaper and safer than the former method, the idea of combining the functions or separating the methods in former days usually becomes a very effective rule of improvement. This means that people not only look for one purpose or function but usually multipurposes and multi-functions.

(a) Pencil and eraser

A pencil and an eraser are needed when we write a letter but these have an entirely different function. A pencil with a built-in eraser in its head is devised to facilitate making our writing easier because of combining the two different functions.

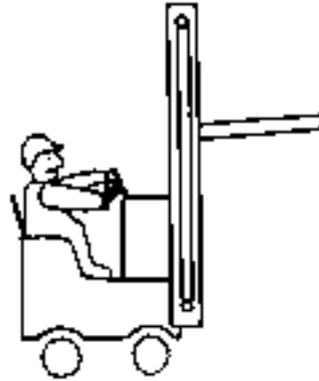
(b) Glasses for long-sighted and short-sighted persons (bifocals).

As the same idea, bifocals for old people are a convenient product which combined two functions that are originally for long-sighted and short-sighted into one product (figure (a)).



(c) Forklift

Forklift is the machine which combines two functions i.e. carrying and lifting up and putting down heavy goods (figure (b)).

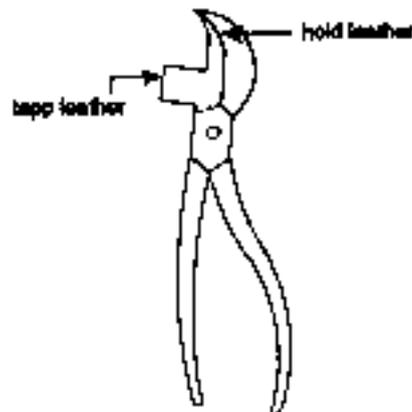


(b) forklift combines two functions (carrying and lifting)

(d) Tool for making shoes

A tool for making shoes (figure (c)) is made by combining two functions i.e. holding (leather) and tapping (leather) from the necessity that a shoe craftsman has to repeat the action many times that he pulls, spreads and taps the leather when he makes shoes.

Because of the tool devised a shoe craftsman does not need to shift tool one after another and that he is able to work more efficiently and easily.



(c) shoe making tool combined holding and tapping function.

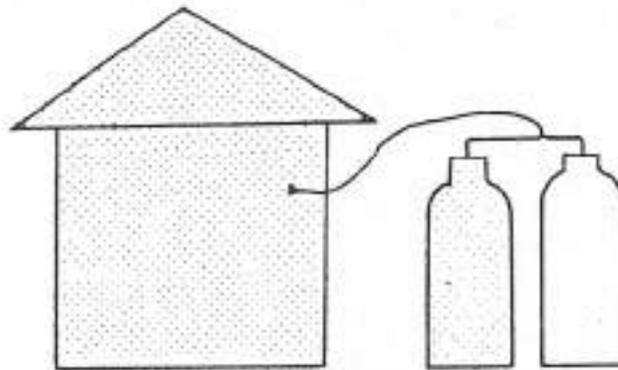
B. Idea of separation

On the reverse of the combining idea, the idea that we might separate the things we used to think of as one thing into some parts often gives us a useful hint for improvement.

In a factory "two bottles system" is generally adopted for the stock control of materials and parts. This is a good idea that when one bottle becomes empty, other bottle is filled. This is a reasonable stock control based on the thinking way of separation.

LP gas being used in our homes usually is serviced by two containers (gas tankers), which is also the same idea of separation.

When a container becomes empty, another container is used.  
(GAS shop fills LPG in empty container)



Two container system of LPG service.

#quoted#

"The encyclopedia of the thorough improvement of workshop".  
(The editorial department of "factory management").

### PRACTICE (It is better to do in a group)

1. In a certain nursery when potting and pricking are almost finished, the field manager planned to prepare the pot for *Acacia mangium* for planting in the coming season after four months. He and the workers collected top soil, mixed the soil with the compost and manure and kept the pots already made in line outside so that he could do pricking anytime.

As for nursery section, workers carry out their works hard and the operation is very good in the proceed.

- # What do you think of the operation?

Pick up some faults and reasons if there are any.

2. In doing our job (Nursery, Silviculture), dig up problems and arrange the problems in a characteristic factor chart.

3. About several problems (mentioned in 2 above).

List up the items of solution and arrange in a characteristic factor chart or in some other style of settlement.

4. Is the indication of the task and information from the superior or other section pertinent or not? Also the one from your subordinate or other section?

- # Point out the problems and work out the solution described in understandable way (table, chart, etc.).

5. When an appropriate plan has been made, the work is considered to be 80% completed. But the work sometimes does not go on well as planned.

- # What are the causes?

Pick up which you can find out through your experiences.

Factual examples:

- # The cause of delay on planting (*Acacia mangium*, *Gmelina*, others).

- # The cause of low rate of field-run-seedlings (including used seedlings for plantation compared with produced seedlings).

Then solve these problems.

6. The following subjects should be discussed in a group.

- # Pick up all problems, works and operations you feel troublesome in carrying out your job in the field (job-site).

- # Point out something which you feel to need improvement in your work and other section's work (including the way of working).

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