

# Water quality management

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## Tapioca, Singkong

Tapioca is a starch extracted from the root of plant species *Manihot esculenta*. This species, native to the Amazon, Brazil, Colombia, Venezuela, Cuba, Puerto Rico, Haiti, the Dominican Republic, Honduras, and most of the West Indies, is now cultivated worldwide and has many names, including cassava, bitter-cassava, manioc, mandioca, aipim, macaxeira, manioca, boba, tapioca plant, yuca (ju : ka) (not to be confused with yucca). Names for it in India include Hindi sāgūdānā (literally, 'grains of sago'), Urdu sābūdānā (a variant of the preceding word), Malayalam kappa or maraccīni, Tamil maravallikkilanku, and Kannada marageṇasina. In Vietnam, it is called bột năng. In Indonesia, it is called singkong. In the Philippines, it is called sago.

# T a p i o c a



## Province Product of Tapioca

- North Sumatra, Batahan River
- Lampung, Mesuji River
- West Java, Citarum, River
- Central Java, Progo River
- East Java, Madiun River

## Act 32 / 2004 Local Government

### Article 13

- (1) Matters concerning the authority of local governments affairs in the provinces is a provincial scale that includes:
- j. environmental control;

### Article 14

- (1) Matters concerning the authority of local governments to District / Municipality is a scale business Districts / Municipality include:
- j. environmental control;

## Law of Republic of Indonesia Number 32 Year 2009 Regarding Environmental Protection and Management

### Article 1

7. *Supportive Capacity of the Environment* shall be the capability of the environment to support the life of humans, other creature and balance of both.
8. *Carrying Capacity of the Environment* shall be the capacity of the environment to absorb substance, energy and / or other components coming into or included onto the environment
13. *Environmental Quality Standard* shall be parameter of the limit or content of creature, substances, energy or components which exist or must exist and / or pollutants whose existences is tolerable in specified resources as environmental element.

Law of Republic of Indonesia Number 32 Year 2009  
Regarding  
Environmental Protection and Management

Article 14

Preventive instruments of Environmental pollution and / or damage shall consist of :

- a)
- b)
- c) *Environmental quality standard*
- d)
- e)
- f)
- g)
- h)
- i)
- j)
- k)
- l)
- m)

Law of Republic of Indonesia Number 32 Year 2009  
Regarding  
Environmental Protection and Management

Article 20

(2) The environmental quality standards shall cover :

- a.
- b. *quality standard of waste water*
- c.
- d.
- e.
- f.
- g.

Law of Republic of Indonesia Number 32 Year 2009  
Regarding  
Environmental Protection and Management

Article 20

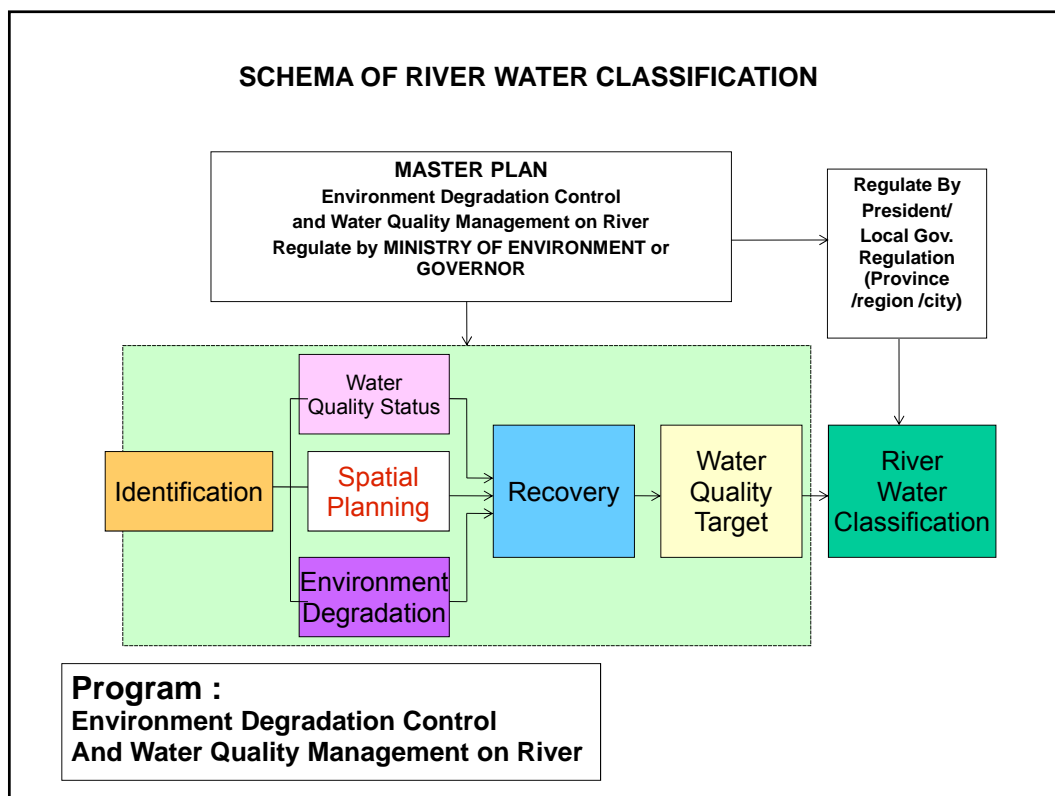
- (3) Everybody shall be permitted to dispose waste into environmental media with the provision that :
- a. the waste complies with the *environmental quality standard*
  - b. the disposal secures license from the Minister, Governor, and / or regents / municipuly in accordance with their respective scopes of authority

Government Regulation 82 / 2001

Article 8

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- (1) The water classification is determined in 4 ( four ) classes :
- (a) Class one, water that can be used for standard water, drinking water, and or other usage that requires the same water quality with such usage
  - (b) Class two, water that can be used for a water recreation infrastructure / means, fresh water fish nurturing, animal husbandry, water for irrigating gardens, and or other usage that requires the same water quality with such usage
  - (c) Class three, water that can be used for fresh water fish farming, animal husbandry, water for irrigating gardens and or other usage that requires the same water quality with such usage
  - (d) Class four, water that can be used for irrigating gardens and or other usage that requires the same water quality with such usage.



## Government Regulation 82 / 2001

### Article 21 (1, 2 )

21(1) The National waste water quality standard is specified with a Ministerial Decree by taking into account suggestion from related government agencies.

21 (2) The waste water quality standard is specified with the Provincial Regional Regulation with the same or tighter stipulation from the national waste water quality standard as meant in the paragraph (1)

## Article 52,57 (1,2)

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*52. The waste water quality standard for a type of certain business and or activity that has been stipulated by the regional government still applies as long as it is not contradictory with this Government Regulation.*

*57 (1) In the case a type of business and or activity, whose waste water quality standard has not been determined, the waste water quality standard that applies in the area can be stipulated after obtaining a recommendation from the Minister.*

*57 (2) The stipulation on the waste water quality standard as meant in the paragraph (1) is specified with the Provincial Regional Regulation.*

## Government Regulation 82/2001

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Article 1, number 15 :

*“Waste water quality is a perimeter measurement or a number of a pollutant element whose existence is restrained in the waste water that will be discharged or released into source of water **from an undertaking and or activity**”*

## Indonesia's River Water Quality Year 2004 - 2010

There are 33 rivers that are being monitoring for quality (a river for province ) by MoE. Each river monitored at least 3 times a year on 3 different location, those represent the upstream section, midstream section and downstream section.

The total amount of sample collected reached  
1411 sample by the year 2010

No.	ISLAND	SAMPLE AMOUNT						
		2004	2005	2006	2007	2008	2009	2010
1	Sumatera	267	197	316	209	437	414	462
2	Java	170	319	312	313	285	391	329
3	Bali & Nusa Tenggara	36	34	36	36	90	96	150
4	Kalimantan	48	42	62	68	131	159	165
5	Sulawesi	68	72	74	79	256	250	209
6	Maluku & Papua	28	18	29	29	113	150	96
	<b>INDONESIA</b>	<b>617</b>	<b>682</b>	<b>829</b>	<b>734</b>	<b>1312</b>	<b>1460</b>	<b>1411</b>



To ascertain the quality of the river water, used by comparing the parameter of the TSS, DO, COD to the **class II** Water Quality Standard (water recreation infrastructure / means, fresh water fish nurturing, animal husbandry, water for irrigating gardens )

No.	ISLAND	PERCENTAGE DOES NOT REACH CLASS II WATER QUALITY STANDARD						
		2004	2005	2006	2007	2008	2009	2010
1	Sumatera	66	72	61	47	41	36	33
2	Java	62	55	74	69	65	74	62
3	Bali & Nusa Tenggara	50	76	81	39	28	58	46
4	Kalimantan	60	67	69	65	70	80	69
5	Sulawesi	60	51	61	61	41	57	55
6	Maluku & Papua	54	33	48	83	32	37	55
	<b>INDONESIA</b>	62	61	67	61	47	56	50

## Waste Water Standard

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*Policy tool to restricted the entry of water to environment*

**What are restricted :**

- Pollutants parameter key
- Concentration ( level )
- Load ( the amount contained )

**Restriction background :**

- Technology & economic feasibility
- Environmental capacity ( e.g water )

## SETTING ENVIRONMENTAL QUALITY STANDARD

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### (A) Ideal approach :

- *Load carrying capacity pollution*
- *Quota principal proportionally for every pollution source*

### (B) Practical approach

*Best Practicable Technology, there are middle technology and economically appropriate*

## SETTING ENVIRONMENTAL QUALITY STANDARD

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### Principles

#### (1) *Practical approach*

- *Effective, could decrease pollution load*
- *Administrative, administratively easy to implement*
- *Economy, will not cause high cost economy*

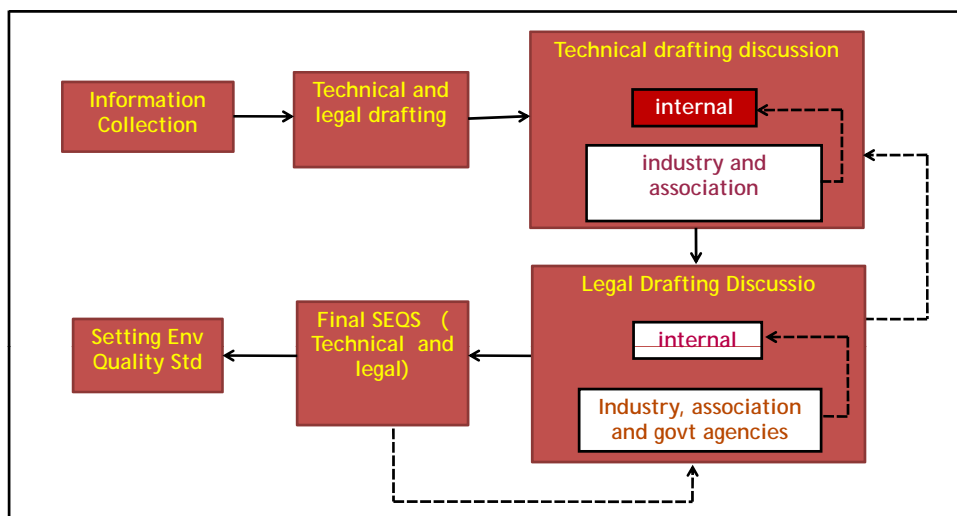
## SETTING ENVIRONMENTAL QUALITY STANDARD

### Principles

- (2) *Technology based, measurable environmental standard implementation can be changed gradually*
- (3) *The use of key parameter, specific and important parameter, economically easy to control and monitor*
- (4) *The used of load concept, not affected by dilution*

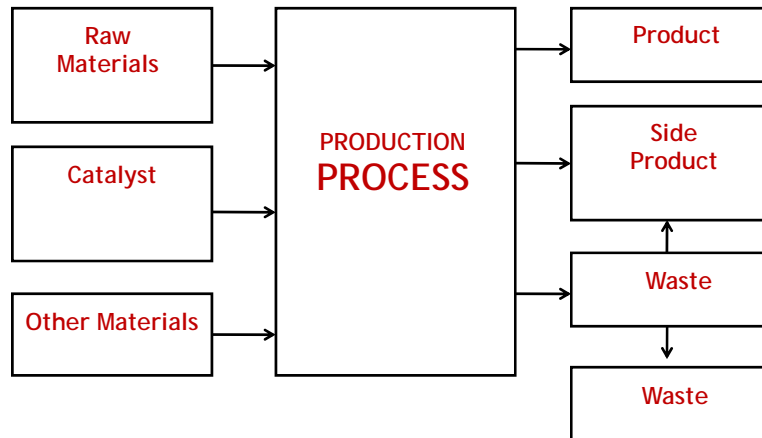
## Setting Environmental Quality Standard

### Procedure



## SETTING ENVIRONMENTAL QUALITY STANDARD FOR INDUSTRIAL ACTIVITIES

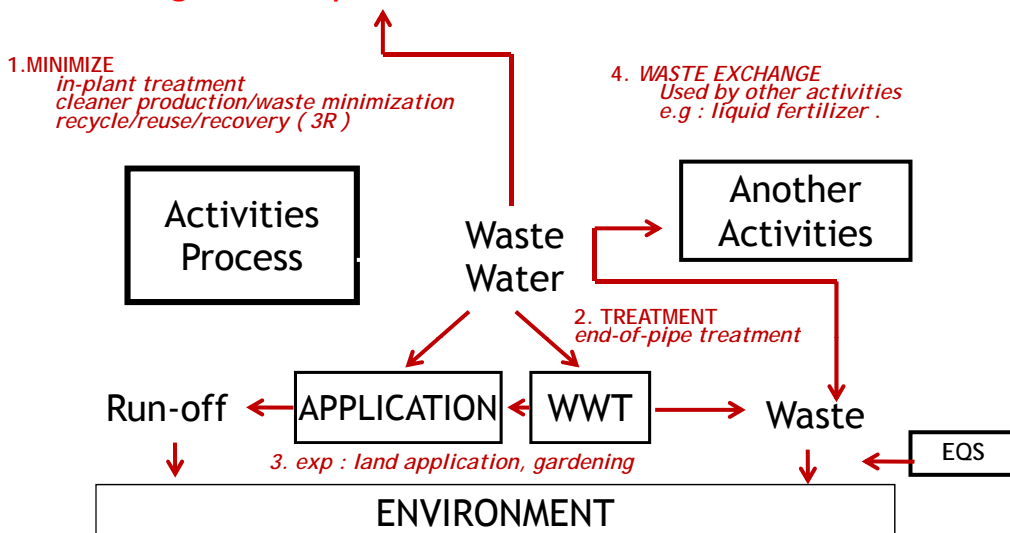
### Information Collection



Each step potentially generate waste

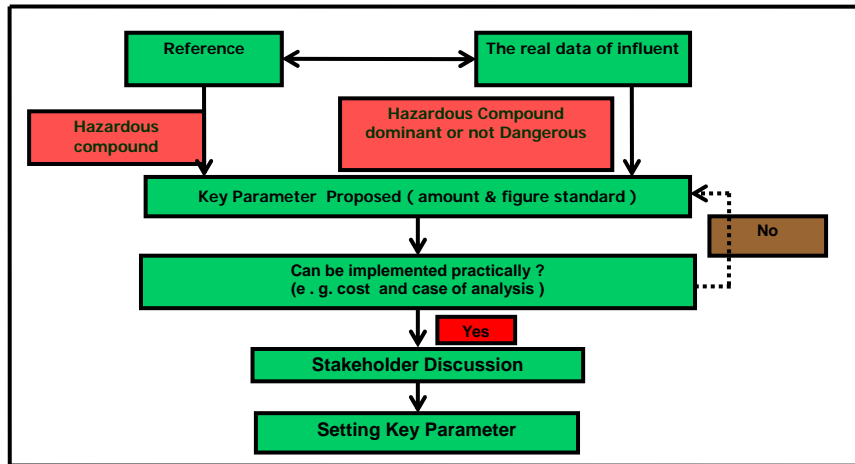
## Setting Environmental Quality Standard for Industrial Activities

### Management Options





# Setting Environmental Quality Standard



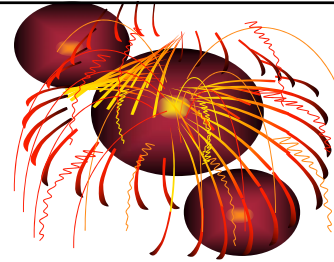
**Setting Key Parameter Procedure**

## Implementation Minister Decree 51 / 1995

### SEPS INDUSTRY TAPIOCA

No.	PARAMETER	MAXIMUM LEVEL (mg/l)	MAXIMUM POLLUTANT LOAD (kg/ton product)
1	BOD	150	4.5
2	COD	300	9
3	TSS	100	3
4	Cyanide (CN)	0.3	0.009
	pH	6 - 9	
Maximum waste debit: 30 m3/ton product			

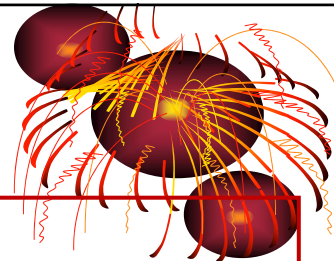
## Evaluatin SEQS



### Data Needed ?

	Fabric Y
	Pengawasan
Quality data	Ccoo = 400 mg/L
Quantity data	Debit, Q = 0,2m <sup>3</sup> /dtk
SEQS Tapioca	COD = 300 mg/L Maximum Debit Waste = 30 m <sup>3</sup> /ton product Maximum Pollutant Load = 9 kg/ton product
Monthly Production data acutual	7500 ton
Day production monthly acutual	30 days

## Example of Calculation



### •Inflow waste Y:

Inflow , Q = 0,2 m<sup>3</sup>/ second  
Concentrated parameter COD, C = 400 mg / L

### • SEPS : COD = 300 mg / L

Debit waste maximum = 30 m<sup>3</sup> / ton product  
Maximum Pollutant Load = 9 kg / ton product

▪ Actual Production per month = 7500 ton / month

▪ Production day every month actual = 30 day

### Evaluation :

debit per month = 0,2 x 3600 x 24 x 30 = 518400 m<sup>3</sup> / month

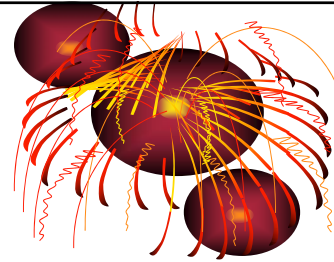
Debit waste maximum actual := 518400 / 7500 = 69,12 m<sup>3</sup>/ton product

Pollutant actual Load :

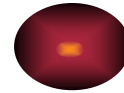
400 mg/Lx 518400 m<sup>3</sup>/month x (month/7500 ton) x (1/1000) = 27,65 kg/ton

## Example of Calculation

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Tapioca Industry Y	SEQS	Actual	Rmk
Maximum Level (mg/L) COD	300	400	X
Maximum Debit Waste Water (m3/ton product)	30	69,12	X
Maximum Pollutant Load (kg/ton product)	9	27,65	X



Thank You

Arigato  
Terima Kasih  
Salamat  
Kop Kun