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Provincial waterworks authority Thailand

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INTRODUCTION

1. In 1979 the Government of Thailand created a new state enterprise, the Provincial Waterworks Authority (PWA), responsible for the supply of water in most urban areas outside Bangkok. In 1982, with funding from Deutsche Gesellschaft Fur Technische Zusammenarbeit (GTZ), GmbH, the Authority appointed Coopers & Lybrand as its consultants on the Management and Finance Project (MFP). The project, which is still continuing, is one of the largest and most comprehensive institutional development projects ever undertaken in the water sector.

2. The improvements in the PWA's performance have been impressive. An operating loss of 38 million Baht in 1982 became an operating surplus of 188 million Baht in 1986. Between 1982 and 1986 the volumes of water produced and of water sold rose by, respectively, 22% and 25%. The number of employees fell from 15.47 per thousand connections to 11.71 and the number of connections increased by 31% from 333,000 to 437,500. The Thai Government has embarked on a programme to ensure that public enterprises meet operating requirements without Government financed subsidy. The PWA is one of the first public enterprises to meet this requirement.

3. The PWA is now regarded by the Government as a 'model public enterprise' and is used for management study tours by other organisations in the Thai public sector. The public and press have more favourable attitude towards its performance. The Authority is more attractive to international aid and lending agencies and development programmes are now underway involving, for example, the World Bank, KfW, the ODA, JICA and UNDP, as well as GTZ.

4. The purpose of this paper is to focus on the contribution to the institutional development process made by the PWA's Training Centre and specifically the methodology which was used to identify, on a systematic and objective basis, the training needs of the 1,300 headquarters and regional staff in the PWA.

Tasks and Skills Analysis

5. Because the PWA had no system of staff

performance appraisal there was no regular, systematic assessment of the training, education and development needs of individual members of staff. It was therefore decided to remedy this by commissioning a tasks and skills analysis exercise to be undertaken jointly by the PWA's Training Centre and line managers. The remainder of this paper sets out the principles of the exercise and its results as follows:-

- (a) objectives
- (b) procedures
- (c) analysis and findings

6. The objectives of the exercise were contained in the terms of reference which required us to:-

"Carry out tasks analysis and prepare a skills inventory for defining training needs in the areas of supervision, management and technical skills at PWA Headquarters and Regional Offices".

7. The objective was to define, by a process of tasks and skills analysis, the training gap, ie. the difference between the level of skills required in each job compared with the level of skill possessed by each postholder. The information produced by the analysis would therefore show the training needed by each postholder and, when aggregated, the overall size of the training task for various groups of staff. It also enabled training priorities to be assessed because the approach adopted included provision for line managers/supervisors to indicate their views on where the priorities for training lay.

8. Procedures for the exercise were centred on a data collection form which is set out at the end of this paper. This form was in the Thai language. In summary the process of tasks and skills analysis was as follows:-

- (a) a team of PWA analysts was briefed about the technique;
- (b) for each post details of:-
 - (i) analyst name
 - (ii) post title
 - (iii) post grade
 - (iv) department/region
 - (v) division
 - (vi) section

were entered on data collection forms by the analysts:

(c) brief summaries of the duties and tasks of each job were entered onto each form by the analysts. Job descriptions were used for this purpose; where job descriptions did not exist, duties and tasks information was obtained through discussions between the analysts and line managers/supervisors;

(d) factfinding discussions were held with line managers/supervisors to:-

(i) agree the "duties and tasks" information on the form ;

(ii) establish details of the minimum levels of education and experience required for each post;

(iii) establish details of the skills and knowledge required to carry out the agreed duties and tasks including, where appropriate, basic, middle or advanced management skills;

(iv) establish any special job-related requirements, which were then entered in the "additional comments" box on the form;

(v) establish the number of staff working in each particular job and enter this information on the form;

(e) each data collection form was photocopied (one for each postholder in each job) and the copies returned to the line managers/supervisors of functions so that they could enter the following on each individual form:-

(i) the name of the postholder;

(ii) details of the education level and experience of the postholder;

(iii) a mark in the "performance satisfactory" or "more training needed" box depending on the line manager/supervisor's view of the performance of the individual concerned;

(iv) a priority rating (described below) for the areas where more training was needed;

(v) an indication of whether the postholder needed training in basic, middle or advanced management training skills. Background briefing notes on these three management training levels were provided to help managers/supervisors. Finally, managers/supervisors were given the opportunity to enter on the form any special comments relating to training needs.

(9) As mentioned above, the system of data collection incorporated a mechanism to allow line managers/supervisors to indicate the priorities attaching to the training needs of their staff. The priority ratings used were as follows:-

<u>Priority Rating</u> <u>By Line Manager</u>	<u>Analysis</u>
1, 2 or 3	High priority; training required as soon as possible.
4, 5 or 6	Medium priority; training required in the medium term.

7 and above Low priority; training to be provided in the longer term.

(10) From the completed sets of forms for each post the analysts then completed a summary of the training needs on a further form showing:-

(a) the skills (training) required, in priority rating order;

(b) the number of staff requiring training; and

(c) the number of staff whose level of education/experience was below that required for their post.

(11) The analysis and findings covered a total of some 200 different types of post (in headquarters and regions) and the following analyses were produced:-

(a) for each headquarters division, details of the training subjects (skills) required, the numbers of staff requiring them and the priority ranking attaching to the training (ie. short, medium or long term);

(b) for each of the regions, an analysis similar to that referred to above;

(c) an analysis of the twenty training subjects (skills) most urgently needed in the short term in headquarters' departments;

(d) an analysis similar to that referred to in (c) above for each of the regions returning data; and

(e) an analysis of (c) and (d) above showing the twenty most urgently needed training subjects (skills) in headquarters and regions.

In this way line managers/supervisors and Training Centre management were provided jointly with a wide range of quantified information on the training required in the PWA ranked in order of priority.

12. The benefits of the exercise can be summarised as follows:-

(a) the tasks and skills analysis output provided the foundation for a regular staff performance appraisal system to be installed by the PWA;

(b) basic training records were established for each person covered by the analysis;

(c) the output of the exercise provided a sound basis for the development of training plans, programmes and courses to be established jointly by line managers/supervisors and the Training Centre;

(d) the effectiveness of the training to be provided could be judged against agreed training objectives.

13. It is interesting to note that the top ten subjects where significant amounts of training

were required were, in order of priority, basic management skills, training skills, operations and production system management, technical English, computer application skills, accounting systems' skills, statistics and data evaluation techniques, budgeting, project preparation, development and communications skills.

14. Further information on successful, practical application of this systematic approach to the tasks and skills analysis process, closely involving line managers, are available from the author on request.

SESSION I
WATER SUPPLY

Chairman: Professor John Pickford
WEDC
Loughborough University of
Technology

PAPERS PRESENTED

E R NICHOL
Rural water supply - W Timor, Indonesia

G GHOSH
Management of drinking water in drought

MOHAMMAD ISMAIL YAZIZ and OMAR DIN
Portable slow sand filter performance

A KUMAR and G V ABHYANKAR
Assessment of leakages and wastages

L F PHILPOTT
Provincial waterworks authority, Thailand

DISCUSSION

E R NICHOL

1. Dr AKALLAL asked what was the life expectancy of the small dams with regard to erosion and the intensity of rainfall. Who was responsible for the maintenance of the dams and what were the reasons for some of them being unsuccessful?

2. Mr NICHOL replied that the life of the dams was recognised as being finite but unknown. It was dependent on the pasture state in the catchment. Legume pasture species were sown along contours to improve soil, reduce soil erosion and increase the life of the dam. Maintenance was in the hands of the Jaya Air (the water watchman) who referred problems to an institutional umbrella, eg public works and forestry departments when dealing with water supply. The reason some of the dams failed was because they were built of limestone soils to prove they would leak, as an example of the wrong material siting. One dam catchment yield was considerably less than expected. This was a limestone catchment with high infiltration so the dam had not filled.

3. Dr BELL asked about the residual water from washing being used for garden cultivation. Was there an indigenous system of such cultivation; what crops were grown and were they used for domestic consumption and/or for sale.

4. Mr NICHOL explained that there was no supplementary watering of gardens. The crops that were tried were various species of beans, tomatoes, carrots and lettuces. Initially, as the village people had no awareness of taste for these crops, they were sold to passing traffic. However, subsequently there was an increase in local consumption.

5. Dr KOOTTATEP asked who was in charge of the management of the dam and how could they ensure equal supplies of water to the villages and individual farmers. He was concerned that those who lived near the dam would get more benefit from it than those who lived further downstream and this would create conflict among the villagers.

6. Mr NICHOL explained that the outlet tanks supplied from the dams had been sited a "reasonable" distance from the village, so that water carrying by the women (a village social occupation) was maintained, but reduced in distance and time. All dams and catchments were fenced off to prevent access to animals, reduce access to humans and ensure that catchment conditions did not deteriorate as contour pasture improvement was undertaken in each catchment. There was an overall institutional management structure for which the Jaya Air was responsible. The Jaya Air was elected by the village group and trained by this project management structure.

7. Dr SRIVASTAVA wished to know the catchment yield during scarcity periods in the dams.

8. Mr NICHOL said that the endeavour was always to balance the annual catchment yield to storage volume. The yield is a function of a number of variables, catchment area and soil type being two of the most important. Initial indications on the Bobanaro clay land systems indicated a yield of 1.0-1.2 Ml/ha/year. A land unit assessment for West Timor had identified land units with suitable material and reasonable slopes that had potential as earth dam sites.

G GHOSH

1. Mr ABHYANKAR commented that with the increase in the standard of living, especially in the cities, the per capita demands for water were increasing and were well over the 140 lpcd mentioned by the author. He asked Mr GHOSH if he could enlighten him on the Government of India's policy in clearing augmentation of urban water supply projects for increasing the supply beyond 140 lpcd, which was quite expensive.

2. Mr GHOSH said that there could be no standard policy. If the source permitted and the community was prepared to pay then the water supply could be augmented. Nowhere in India was 140 lpcd maintained, not even in large cities. Nearly 30%, or more, of the urban population are 'floating'. They were not taken into consideration for calculation of per capita water supply. Expensive schemes should be fully discouraged. This was obvious from the fact that Delhi, Calcutta and other cities were augmenting their water supply through digging deep boreholes which also reduced the cost of filtration/treatment of water.

3. Dr BRADLEY asked what defluoridization systems were adopted in the home and how were they monitored. Was there a feed back system to check the chemical use and what was its effectiveness?

4. Mr GHOSH explained that it was called 'Nalgonda Technique' developed by NEERI (National Environmental Engineering Research Institute, Nagpur). Simple lime and alum were used for treating the water; after standing for some time it was decanted to remove the slurry. Domestic users were encouraged to do this until safe water could be supplied. Camps were organized to motivate village level workers, medics and para-medics and they in turn taught the villagers. A check of the teeth of school children was the easiest and simplest method of detection of fluorosis.

5. Dr BRADLEY also wanted to know what was the most successful (technically and cost effective) iron removal system in India.

6. Mr GHOSH said it was an oxidation process, also developed by NEERI. DANIDA had used one modification in Orissa. However, presence of carbon dioxide affected the process. Along with iron, carbon dioxide must be estimated for the treatment package.

7. Mr LANE asked to what extent the project attempted to direct or advise NGOs on their activities, as they tended to exhibit a wide range of approaches.

8. Mr GHOSH replied that the first priority was to tap those NGOs who were already in the field of RDWS. Some of them were also being used for communication only. Some NGOs working in sanitation and health were also used for follow-up action and health awareness programmes. NAWDA had arranged it.

9. Mr LANE commented that Mr GHOSH had mentioned CAPART and wanted to know if Mr GHOSH had more information about this organization. He worked for a similar organization, SSNCC, in Nepal.

10. Mr GHOSH said information about CAPART could be obtained from the Director General, Council for Advancement of People's Action in Rural Technology, Guru Narak Bhavan, Mehranti Road, near Quto Hotel, New Delhi. The Director General is Mr S M Patankar and the Deputy Director General is Mr Ashoke Jetley. He also suggested that Mr LANE might like to contact Dr M A Ghone, Secretary, National Association of Water Development Agencies (NAWDA), Shanker Shet Road, Pune, Maharashtra, India.

11. Mr NEPAL asked if it was possible to lower the water demand without rationing. He said that water demand was related to living standards and facilities provided within buildings. Water demand should theoretically be kept to a minimum but practically it was the reverse and needed some sort of sewerage system.

12. Mr GHOSH replied that if in a system the supply was less than the demand then either the community distributed it equally or a group got the lion's share. In such a system the Government had to step in to fill up the gaps but this would certainly affect the sewerage system too.

13. Mr NEPAL suggested that the excessive use of groundwater might lead to permanent lowering of the groundwater table whereby making it impossible for ordinary handpumps to work. He said that last year's drought had already lowered the water table by four metres. He asked Mr GHOSH for his comments.

14. Mr GHOSH commented that only 4.6% of groundwater abstraction was used for drinking purposes. It was the excessive demand of agriculture and industry which affected the groundwater table. In a good rainfall year recharging was not a problem but it was most important to maintain the water balance. That was why the India Mark II handpump had been encouraged and not tubewells with submersible electric pumps. The sinking of tubewells in areas of water scarcity was to be controlled by legislation.

15. Dr OKOYE enquired if the Government of India had considered a user charge and community participation (in cash and kind) in their current water project/programme.

16. Mr GHOSH said that at this stage they had not but under the present programme if a piped water supply was provided a charge was made. Under the first programme, provision of safe drinking water was the responsibility of the Government, but the maintenance of the system was the responsibility of the local community. Community participation at this stage was thought of in the form of kind, in some cases by money.

MOHAMMAD ISMAIL YAZIZ

1. Mr KOLSKY asked for additional information on the performance of the filter on less polluted water, as the bacterial contamination of the reported raw water was very high.
2. Dr MOHAMMAD explained that the SSF used in this study was relatively immature, ie the Schmutzdecke layer had not developed even after twenty days. The data for bacterial removal efficiencies (94-97%) were more the result of physical straining and other physical forces than biological degradation. At this stage adequate data were not available on SSF efficiency for cleaner water sources (eg rainwater); nonetheless it was anticipated that a mature SSF would be able to remove bacterial contamination in cleaner waters as well as grossly contaminated waters.
3. Mr HUTTON commented that short circuiting on tanks could lead to loss of efficiency and asked if this had been considered.
4. Dr MOHAMMAD thanked Mr HUTTON for his comment and said this had not been considered but that it would be in future studies.
5. Dr OKOYE stated that experiments carried out in Corvallis, Oregon, USA, using the SSF approach presented by the speaker, showed that over a one-year period Schmutzdecke formation took twenty-one days to mature and only then could the SSF function efficiently. Influent water was taken from a stream with low microbial flora. It took three months to get the SSF to function without a breakdown occurring as a result of many factors such as plugged valve, silt accumulation and pump breakdown.
6. Dr MOHAMMAD said that in the literature the times quoted for the development of the Schmutzdecke layer ranged from twenty to ninety days. In some cases shorter periods were obtained through the use of seed material. It was difficult to place a fixed value on the time required since a great deal depended on the actual quality of the raw water used. In this study, using mining pool water abstracted one-third of a metre below the surface and four metres from the bank, no significant development of the Schmutzdecke was found after twenty days.

G V ABHYANKAR

1. Mr SALAMAT WAHIF asked if the percentage of leakage due to inaccuracy or under-registration of water meters had been

evaluated. If so how much did it contribute to the total leakage level. He commented that proper management and maintenance of water meters would reduce the leakage due to under-registration of the meters.

2. Mr ABHYANKAR explained that loss due to under-registration of the meters would not be a leakage loss but a revenue loss so it would not affect the leakage levels. In the case study presented he said the aspect of meter inaccuracies had not been covered. Moreover, only 10% of consumer connections were metered in Jamshedpur.

3. Mr RICHARDSON asked if any attempt had been made to link the leakages recorded with the pressures which pertained at the time of the measurements in order to assess what could have been leakage levels under higher and more normal pressures. He commented that the estimated per capita consumption figures in column 6 Table 2 seemed very high when compared with figures quoted on Indian consumption levels by other speakers in Session 1.

4. Mr ABHYANKAR replied that in this case study relationships between pressures and leakage levels had not been assessed. He said the estimated per capita consumptions were based on metered consumption in a few houses in each test zone and were therefore likely to be close to reality. The overall gross per capita supply in the city was also high, around 250 litres per day.

L F PHILPOTT

1. Dr BRADLEY asked when the needs assessment was carried out in the project cycle. Was it found necessary to first establish performance indicators. Was there a tendency for training to be viewed as a "perk", particularly for training venues overseas and in main cities.

2. Mr PHILPOTT explained that the training needs assessment was undertaken two years into the project cycle, after a thorough review of the PWA's organisation and management systems had been undertaken and the subsequent process of change was underway. Part of the organisation review, along with the wide range of other work being undertaken, was the establishment of a series of performance indicators against which organisational performance could be measured. Training could sometimes be viewed as a "perk", particularly for training venues overseas and in main cities. As long as such training was effective in its own right, and was complemented by effective training provided locally, overseas training could be viewed as a logical incentive to be offered to those who would benefit from it.

3. Mr GHOSH wished to know the content of the training. He suggested that operators could be the best carriers of messages of health. He asked Mr PHILPOTT for his opinion.

4. Mr PHILPOTT replied that the content of the training provided by the PWA related to a wide range of jobs in PWA headquarters and the ten PWA regions. Essentially, the training was practically based, wide ranging in terms of technical and management skills and was dedicated to improving the level of knowledge and skills of postholders. Messages for health were important and should be included in training modules provided for staff who have direct customer contact.

5. Mr GHOSH asked how the low level staff were motivated.

6. Mr PHILPOTT said that the motivation of lower level staff was important and the driving force for this should come from first line supervisors and, in turn, line managers. The commitment of line managers and their involvement in training is central to this process. Lower level staff would regard their jobs as valuable only if their line managers demonstrated that they recognised this value. It was important for line managers to have close and regular contact with lower level staff and to ensure that the staff were informed on a regular basis about what was going on. There were a number of well-tested mechanisms for doing this, including news-sheets. Equally, lower level staff should be given an opportunity, perhaps through briefing groups and/or quality circles, of making a contribution towards organisational improvement. Staff rotation between jobs and job restructuring/enrichment programmes were a further method of motivating lower level staff. Finally, staff at all levels must be given a career structure, which, if they took advantage of it, provided opportunities for advancement.

7. Dr KOOTATEP commented that in his opinion PWA have their own problems of staff knowledge and a number of problems of having the wrong man on the wrong job. This could be solved by their own management and things could be put right. He wondered whether any training programme would solve the problems.

8. Mr PHILPOTT stated that training should be made available to improve individual/group job performance. In addition, where it was necessary for individual members of staff to move from one job to another, training should be made available to help the jobholder to acquire the new knowledge and skills which are required. In a large organisation such as PWA with 5000 employees, the process of

identifying, establishing and implementing a comprehensive training programme was, of necessity, a relatively long term one. This emphasised the need to approach the identification of training needs in a systematic way so that training priorities could be established and management helped to direct resources to the most appropriate parts of the organisation.

9. Mr MUELLER asked if a part privatization of the Provincial Waterworks might help to overcome the difficulties and improve the service to end consumers.

10. Mr PHILPOTT replied that privatisation of parts of a water utility could help to improve service to consumers provided the objectives of privatisation were identified at the outset, the appropriate privatisation "model" was chosen and the process of privatisation was carried out effectively. His experience had reinforced the conclusion that there is no universally "correct" way of organising water supply services. Different cultures, economies and development objectives are among the factors which impact on this. In general, however, a form of "corporate" model for a water supply organisation was likely to be more appropriate than the "government department" model since the former encouraged a more objective-orientated approach and freed the organisation from day-to-day detailed controls which may have inhibited its ability to provide the required level to its customers and make an appropriate charge. Within a corporate framework it was then often advantageous to "privatise" at least some of the activities which were carried out. By this means it may be possible to bring in private sector skills which would otherwise not be available to a public sector organisation and improve the effectiveness and efficiency of the services provided.

11. Mr RICHARDSON, taking up an earlier point, said that he had found in his work for PWA in Chonburi in 1986, that the PWA-public contact point focussed on low grade employees such as meter readers and bill collectors. He commented that these appeared to have been given an absolute minimum of training and had not been made to realise, nor given credit for the importance of, their ambassadorial role. An example was that Chonburi meter readers were expected to spot and report a malfunctioning consumer meter, but received virtually no training to help them recognise such cases, either by direct observation or by interpolation of meter readings.

12. Mr PHILPOTT said that training in "relationships with the consumer/customer" was an important part of the training which should be provided for staff who have

customer contact. It was vital that a broad view was taken of all training needs, in the process of training needs analysis, and that activities which enhanced service to the consumer were emphasised. Typically, and understandably, water supply authorities and utilities had placed overriding importance on the need to train their employees in technical disciplines to ensure that water supply facilities were built and operated in a safe and effective way. Increasingly, however, it was recognised that training in management, finance and public relations played an equally important role in helping to meet these objectives and provide safe and secure water supplies on a long term basis.

13. Dr SRIVASTAVA asked if the keynote was the output indicator. If so, how was, say, drinking water to the end beneficiaries related to the impact of training of line managers.

14. Mr PHILPOTT replied that output indicators are initially vitally important in terms of measuring organisational performance. The provision of training was one of the methods of improving organisation performance and there was much evidence that the best organisations placed heavy emphasis on training and development. However, direct measurement of the link between training and output could only be measured in certain circumstances, eg better productivity and accuracy from staff whose job was, for example, to process financial accounts. In other instances, eg management development, quantifiable measures were much more difficult, if not impossible, to quantify in anything like a direct way. Typically, for a water supply utility, overall organisational performance measures would include, for example, the percentage of the population served with water, the volumes produced and distributed, volumes of water unaccounted for, hours of supply in a day, water quality measures, ratios of employees to connections, and financial indicators such as unit costs, billing levels and collection performance.