Minnigh

Annex II

EVALUTATION REPORT

DRINKING WATER SUPPLY PROGRAMME IN KABUPATEN MANGGARAI WEST FLORES, INDONESIA IMPLEMENTATION BY YAYASAN ST.KLAUS, KUWU

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Mission report for Intercooperation
(Swiss Organisation for Development and Cooperation)
submitted by Pam Minnigh, Consultant

EVALUATION REPORT - JANUARY 1994

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INTRODUCTION

This report is the result of a short mission carried out on request of the Coordinator of Intercooperation in Ruteng, Manggarai, Flores, Mr. Peter Winkelmann. The TOR (Terms of Reference, see Annex 1) was send in advance and was discussed directly upon arrival. Headquarters of Intercooperation in Bern requested an additional term of reference regarding the concienceness, as to the felt need for additional advice and assistence from outside (YSK or other NGO), of the community.

The cooperation between Intercooperation and YSK is going to be modified as from July 1994, whereafter YSK will not implement new constructions but will perform some monitoring and follow-up tasks in former project villages. At this phase of the cooperation it is deemed necessary to get an overal view about the status and the sustainability of the completed projects. This short mission will be a first attempt to evaluate the water supply, hygiene and sanitation situation on the basis of several field visits. Although the involvement of YSK in certain regions of the Manggarai will change as said before, this report includes some considerations for future follow-up, monitoring and sustainability.

The water supply systems of the 5 Desa's; Paang Lembor, Colol, Robek, Rura and Anam, were visited and all individually commented upon (see in Annex 3). In Chapter 2 an analysis will be given concerning the technical and institutional aspects of the implementation by YSK. The hygiene and sanitation aspects will be shortly mentioned. The analysis will befollowed by the conclusions and recommendations in Chapter 3.

The limited time for the evaluation has lead to a more in-depth assessment on the basis of observation, unstructured interviews and group discussions. The report by K. Wehrle, SKAT, (Missions Report for Intercooperation, November 1991) has provided a usefull lead for this evaluation. Some key staff of YSK (Yayasan Santu Klaus) were not available however this did not hamper the field visits. Together with the very helpfull staff of YSK, technical staff and 'tim basis', (the extention team of YSK), the overall support of Pater Ernst Waser (YSK) and Mr. Peter Winkelmann and with the cooperation of the local water user groups, a good overall view of the situation in the Desa's could be obtained. I would like to thank them all for their cooperation and active involvement.

1. BACKGROUND INFORMATION

During the past 8 years 19 water supply systems (WS systems) in the Manggarai, Flores, were financed by Intercooperation-SDC (see Annex 6). YSK has realised 13 WS systems and is still working on 6 other systems. The project included construction of gravity water supply systems as well as a diversity of follow-up activities in the project villages.

In those 8 years the experience of YSK grew and the way they dealt with construction, extention and institutional aspects changed. What remained the same was the procedure for a Desa to apply for a water supply system, developed by YSK . A proposal has to be formulated by the Kepala Desa (the village head, Kades), with the help of several other village members. On the basis of this proposal YSK will send its technical team to do a survey. The survey has to indicate; 1) how and if the construction can be realised, 2) the community supports the idea and has 3) the potential to finance at least 10% of the total sum. If this is confirmed the LKMD of the Desa (the village executing agency), is asked to make a budget. This budget has to be given to YSK and has to include the contribution of the community in materials, labour and in cash (10% of the total budget). This budget is send to donors and to the governmental authorities to look for financing.

If financing is found a contract is made up between the representative of the Desa and YSK (see example Robek, Annex 8) The project is executed by the technical project staff of YSK together with the community. During the last 2.5 years the 'tim basis' has supported the installation of the project with institutional support. The community has to provide local materials, labour, food and lodgings.

To support the operation and maintenance (O&M) and to ensure the sustainability of the physical construction of the systems, YSK has introduced a village Water Supply Management Organisation, the OPA (Organisasi Pengelolaan Air Minum, see Annex 7). The director of OPA, usually the Kades, together with the LKMD and the heads of the water user groups form the core of this organisation. Together they have to manage their water supply system technically and financially.

YSK has provided on-the-job training during construction for villagers to become caretakers, so-called 'kader', (two per Desa) who have to deal with technical problems which may arise during operation and maintenance of the system in their Desa. The 'tim basis' has during its 2,5 years of operation organized 8 trainings of one week in Kuwu with between 20 to 30 participants, heads of the water user groups (women), per training. During these trainings they were informed about aspects like health, hygiene, regreening, nutrition, water and sanitation. The preparation in advance of the community as well as follow-up visits afterwards were carried out by the 'tim basis' and covered all activities as mentioned above.

2. EVALUATION OF THE WATER SYSTEMS IN 5 DESA"S

2.1 General

The evaluation is based on the field visits which were carried out in 5 Desa's. Of each Desa the description of the observations can be found in Annex 3. Some photo's taken during the visit illustrate the observations made and they can be found in Annex 4.

2.1 Technical aspects

Physical constructions:

design:

Most of the WS systems are designed and build more on experience than on extensive calculations. Systematic construction data are not assembled. The design can be found in the contracts between the Desa and YSK (see example of Robek, Annex 8), based on the preliminary survey and the proposal of the LKMD. The last page of the contract contains technical designs of several constructions such as a captation, a siltbox and a reservoir. Every contract is made with the same designs, no modification is made according to the project site, except for the name of the Desa.

debit:

In the five villages the debit at the source is sufficient and in four of the five villages enough water at an acceptable pressure reaches the taps.

source/spring:

Visible protection of the source/spring apart from the concrete box at the place of the spring was partically non-existent (2 sites) or absent (3 sites). The springbox and siltbox are simple and efficient however some are hard to open and therefore to control and to clean. The condition inside confirms this observation, roots and other material were found in it. Seperate inspection chambers at the spring site are not always constructed.

trenching and pipelaying:

It was hard to assess the trenching and the laying of pipes. However many pipes laid bare, especially of the old systems, through erosion and land slides. Most of the systems are constructed with galvanized iron pipes (GI) which provides a solid basis for a system. However because this is a known feature of these pipes, the communities tend to neglect their maintenance which can lead to problems for pipes especially with smaller diameters. The condition of the soil in some places, like acidity, will also lead to corrosion problems in the long run if no precautions are taken against this. The overall and concrete support of the three gully crossings (Paang Lembor, Rura and Anam) should be reexamined and if necessary be reinforced.

concrete constructions:

Most of the constructions as reservoirs, collections boxes, brake pressure and other tanks were in good condition. In most cases the masonry is well done and the concrete is cured well, no leaks were found even without water resistant paint on the inside. Of nearly all the tanks the manhole was or not closed at all or forced open or the lid not secured or it was closed forever with cement (Anam). Nearly all the overflow pipes directly sorting the tanks were placed so that they either eroded the tank itself or the controlbox with the valves. The lid of the controlbox with the valves, placed at the side of the reservoirs was often broken or not present at all. The risk that the valves may be damaged severely is high. The valves themselves were mostly broken in one way or another and a lot of them were repaired provisionally with rubber bands.

condition of the taps, floors and washrooms:

The condition of most of the taps, more than 80%, is not acceptable (insufficient). It was reported that many taps were repaired but still most of them leaked. Some were not even present and many were repaired with rubber bands. Especially in Colol and Anam a lot of water is spilled because of the water that is running continuously like a pancuran. The tapstand design has changes over the years from a hardly supported loose pipe with a tap at the end to a solid construction. It is expected that this will prohibit the breaking of pipes near the tap. The floors of the new systems are still in reasonable condition as far as the construction is concerned, in most of the old systems only remains of the floors can be found or they have disappeared completely. Only one washroom was shown and its design and solid construction by YSK look promising for further implementation.

Operation and Maintenance:

condition of the spring area:

Most of the spring areas were not well kept or controled regularly. The same can be said about the inside and outside of the tanks and chambers at the site of the spring. Although it was reported in several Desa's (4) that once a year this area was cleaned by the villagers, the condition was not satisfactory.

That control, maintenance and protection of the 100 meter protection area around the spring has to take place is well known but the execution of this idea remained unclear. Other measures for protecting a captation (spring catchment) such as drainage ditches for the run-off of surface water or a fence or hedge as protection were absent.

debit:

Reports on a decrease of the debit of certain springs were divers. Most of the time it was denied but no trustworthy data are available.

pipe network:

The main pipeline should whenever possible be dug-in or at least covered up especially if it is of PVC because this disintegrates through sunlight. Although in all the Desa's the pipes were dug-in still a part (20-40%) were bare and no maintenance was seen or reported. Attention to this aspect was only paid at the time of contruction.

concrete constructions:

Most of the constructions along the main pipeline were also not cleaned inside or outside. Some reservoirs/tanks had locks which were broken and some clearly demolished. In one case the locks which closed the lids over the tanks were broken open and a question about the acceptance of the system by several villagers can be posed.

maintenance of the taps, floors, fences and washrooms:

The condition of the taps already indicates that maintenance is not sufficient. Together with the lack of maintenance goes the deterioration of the floors and the fences. In most cases when the system is still new, efforts are made to make a fence and even drainage facilities but after some time this interest stops and the situation deteriorates. The systhematic use of waste water or interest in the use of waste water from taps was not found. The interest in washrooms is high but only one good example which was intensely used (Paang Lembor), could be found during the visit.

2.2 Institutional organization

Organisasi Pengelolaan Air Minum (OPA)

The function of OPA was always clearly stated during this visit and the Kades as well as the head of the LKMD always hold, because of their formal administrative role, the most important posts. Whether they are also a user of the system or not, which is again strongly linked with their interest in the system. The OPA is there but it does not always act as such. If the OPA members of the finished WS system are also the ones who started the procedure for the WS system, then a high interest is found. Only once the contract with the contractual obligations of YSK and OPA was mentioned and discussions indicated that actually only the Kades and the 'kaders' were aware of the contents of this contract.

Initial meetings with all users had nearly all been held. However the continuation of the management at every level like the OPA general management and the user groups, is difficult. Most of their activities are linked with the collection of their yearly contribution, others like operation and maintenance, lack behind. The contributions mentioned were between 1000 and 2000 Rp. per year per family (KK). Every village had difficulty to get it and to explain for what this money serves. Even more when it is collected seperately from the monthly contribution at the level of the user groups. It was said that cash books with the names of the members were kept in 3 of the five villages but not one was shown to the team.

Caretaker or 'kader'

In all villages one or two 'kader' could be identified. All had been trained 'on-the-job' during construction and only one indicated that at the time he was not completely willing to cooperate with YSK. The 'kader' could explain what his task is but if it comes to the execution of it, this remains vague. None spoke about a logbook of executed repairs or about specific payment for jobs done. In two cases the set of tools was present, the others lacked a set or it had already disappeared. Nowhere are spare parts directly available in the Desa, if something brakes down the spare parts have to be bought at the market. Preventive maintenance doesn't come into the picture at all. Whether the 'kader' is called when a tap brakes down or if he is only considered to be there for big repairs was differently conceived in every Desa. Only in Colol the 'kader' himself undertook the execution of an extention of the existing system on the initiative of the Desa itself. In two cases the 'kader' indicated that the training received was not enough for the interventions which had to be done by him and they would like a prolonged and more appropriate training.

Users groups or tap groups

All of the user groups were different and managed their tap differently; very much involved, modestly involved and not interested at all. More than 90% had already more than once changed their tap and some had opted for another type of tap. The age of the system and the availability of water determined the willingness to maintain and operate their tap in the long run. Some were very disappointed because their tap broke down very often and it was hardly any use to change it every time. Others had difficulty with the support of the other members and only good intentions had brought them nowhere until now. The functioning of the taps depends also very much on the authority and age of the head of the users group (or her husband) and the support from the Kades. Without authority or being young and without the support of the Kades, the whole user group organization is very weak. Priorities of the OPA management, the governmental administration, the heads of the user groups and the user groups themselves can vary very much but they determine what action will be taken.

The newest groups had trained women as heads of the user groups and they showed more involvement than any of the men who were appointed heads of the WS systems before 1991. Because all these groups and the systems are new no comparison can yet be made with the older groups run by men as to the condition of the taps.

The contributions of the families in the user group remain difficult and as said before they highly depend on the availability of water and the age of the system. In more than 75% of the groups one family (KK) has to pay an amount between 200 and 250 Rp. per month. In some groups this can also be payed in kind as tobacco or vegetables. The new idea of YSK of selling vegetables to get money for repairs appealed to a lot of women but only two tap groups had actually been using it

this way, others had used it for their individual household. The use of waste water for vegetables and plants was highly contested as bringing damage to the crops. No structured use is made of waste water or drainage water and in most cases no attention is payed to this at all.

Yayasan Santu Klaus (YSK)

The performance of YSK should also be taken into consideration. The technical staff are regarded highly in all Desa's and their contact with the villagers is good. Although their technical design and implementation is not strictly via the book, most of their constructions are solid and they work.

The 'tim basis' is a very enthousiatic and engaged team and the ones involved in water and sanitation are already well informed about the basic elements of a WS system and sanitation facilities. However most of the staff members are quite young and although being involved in education it is not always easy to get the ears of the community. They have also difficulty to be creative in their communication with villagers and tend to be directive. The number of subjects and activities they have to cover, especially during the training, is very divers (see Annex 9, for information regarding PAM given in the Kuwu course). It was indicated by women in different villages, that the subjects during the course on water and sanitation such as operation and maintenance, use of water, tap repair and financial management didn't get enough attention. Most women indicated that they were not able themselves to change a tap inspite of the training in the workshop. However, the existance of this team and the Kuwu course, has widely encouraged the users groups and especially the women to start and manage their own affairs and the support is largely felt. The difference between the systems build without the institutional support of the 'tim basis' and with it, has even led to demand for training of the groups who had not been present before but had heard of the existence through the Sarasehan meeting in Kuwu.

2.3 Hygiene and sanitation

In only two Dusuns sanitation facilities were encountered, Dusun Wae Kilit (Desa Rura) by YSK and in Desa Colol it was done by the PKK. All activities in this field are new and only the fact that the people proudly showed us the facilities and the use, is an indication that there is a willingness of the population to work on it. The latrines in both villages were nearly the same, a bamboo superstructure with a cement squatting plate and mandi basin with a let-out to a dug pit of 6 meters. This type of latrine is appropriate but the pit behind it can be dangerous for small children because the cover of a thin layer of bamboo, is not very strong. Howfar this introduction of latrines is supported by hygiene education could not be established.

Hygiene aspects as well as the handling of water in general are not easy to introduce as well as to assess. What could be seen was the usually poor conditions of the environment of the taps; not clean, stagnant water, poor fences etc. Although there is a tendency to use tubes to get water near or in the house it is actually forbidden by YSK. Some people however have already build small reservoirs in or near their houses which they provision with tubes. There are no data on the water quality. To detailed survey of the hygiene situation in or near the houses or concerning the water transport vessels, went beyond this assessment.

3. CONCLUSIONS AND RECOMMENDATIONS

This short evaluation has shown that every WS system was different and even every tap users group has developed its own strategy to manage their tap. As it is the intention not to continue the programme as such, the main preoccupation has to be how to achieve sustainability of the existing WS systems. In this respect I fully agree with the remarks made by Wehrle, (1991) that "sustainability can only be achieved with longterm support".

3.1 Technical aspects

On the whole the technical constructions are strait forward and most of them function according to their conception. The design data and files per WS system were not compleet therefore a detailed assessment based on construction data could not be made but the findings during the field visits provided ample leads to concentrate upon.

Construction and design elements which can be improved:

Continiously running taps

Taps whereby the rubber is broken or where the tap has completely disappeared cause many problems for the WS system. Reservoirs run empty and taps down the pipeline will have less water or none at all. It can damage the floor and the drainage water can stay in stagnant water pools. If a tap cannot be replaced directly facilities must be present to close it down temporarily with a valve near the tap or at the side of a reservoir or with a cover at the place of the tap. It is advisable to check on other sorts/makes of taps with a prolonged life and other protective measures together with the user groups.

Trenching, pipelaying and gullycrossings

These elements should be checked regularly and when necessary repaired. Bare pipes should were possible be covered-up. If the soil is rocky the pipe should also be covered and supported with rocks and gravel. Erosion and landslides should be avoided with protective measures. (see K. Wehrle, 1991).

Positioning of the overflow

The overflow should be placed well away from the reservoir/tank/chamber so that it doesn't erode the reservoir itself and that it is easy accessible for the community to use the overflow water.

A lid over the manholes and the control boxes (with valves)

It is recommended to close the manholes and control boxes, free access can polute the water and damage the construction. However this closure should not inhibit regular inspections. Lids with normal locks or other easy demolishable parts have to be redesigned. A lid that is integrated in the construction (sunken into it) with a lock that needs for instance a not-regular size bougie-key is a solution.

debit:

No dependable data were found on the measurements or a decrease of the debit. The amount of water available depends on the amount of water present in the water catchment area. The debit in the WS systems depends on the construction of the captation and distribution network. The protection of the 100 meters around the spring will protect the construction and the quality of the water but not the yield. In view of reports on decreasing debits, monitoring should be carried out regularly to measure the debit and take stock of the (changed) landuse situation in the water catchment area. This should be one of the main aspects of the follow-up visits.

Operation and maintenance:

On the whole the O&M aspects are very weak, it is neglected and usually the OPA organization is not strong enough to impose a certain behaviour upon the villagers. Demoralisation is also an element which cannot be denied. Many user groups have tried in the beginning to take care of their taps but they had to be repaired often and after some time the willingness to spend money and energy waned. To neglect O&M will eventually lead to destruction of the system and therefore it is necessary to revive and strengthen the efforts to take care of the system. Thorough follow-up visits can bring out these aspects and apart from just repairing them, prevention and a change in design according to the experiences should be a point of discussion during the OPA and village meetings.

YSK (or another NGO) should check also if the 'kader' which they trained is ready to do the repairs or if they are in need of additional training. Nevertheless it is not the task of YSK to do other repairs or provide missing tools. What can be done by them is to assess the situation and make a proposition to improve it, but this has to be followed by a cost estimate. The village can decide on the basis of this budget what they are going to do. It was proposed and it would be very usefull to provide all Desa's, which have a WS system, with a list of prices of spare parts so they know what they have to face when their system breaks down.

A last aspect which was mentioned was the demolition of the locks near a spring and of a lid of a reservoir along the pipeline. In both cases there was no tap near the spring. However it should be considered that the spring was used by the population nearby before the captation was made. If no facilities are discussed and made for these people, problems can arise and demolition of the construction can be the result. The same goes for people in need of water for themselves or for their animals along the pipeline. If it is not available they will try to get it from a reservoir. Agreements in advance should be made with the population served by the WS system as well as with the population at the place of the source and along the pipeline if this involves another villages. Demands of both groups should be taken into account when planning the WS system.

3.2 Institutional aspects

The institutional framework of OPA which has been created by YSK to carry the responsability for the management of the WS system, still functions as in a start-up phase. Its functioning is more or less concentrated on the financial aspects but the overview is lacking behind. The Sarasehan at Kuwu has given new input to strengthen this organisation. It is difficult to say on what OPA's success will depend but it needs continued support and stimulation for as long as it cannot make itself profitable and sustainable. Regarding the PDAM/BPAM's in Indonesia it is possible, but very much depends on the management and the willingness to cooperate within the organisation and eventually with sister organisations to share resposabilities. If OPA or a private person takes the responsability and can make it commercially feasible than the system will be sustainable.

The example in Robek/Rura showed that a lot depends on agreements made within the village and between villages especially concerning use and ownership of land and springs. If these agreements are not clear, problems will arise and in the worst cases the whole plan has to be abandoned. These problems will arise again when the price of land or the price and need for wood go up. The villagers themselves have to be aware of this and they have to make agreements and take precautions to avoid conflicts.

It should also be noted that the contruction of the WS systems has in certain cases (Paang Lembor, Anam) cleared a path through a forested area and as a result woodcutting has started along this path. In discussions with the local authorities this should be taken into account.

Many of the aspects mentioned above in the framework of sustainability come back to training. In case of a Desa, the need for training has to be identified by the villagers themselves for example during the follow-up visits. For the staff of YSK this need can also exist especially on how to do these follow-up and monitoring visits. The donor (IC) should be aware of this aspect and if they stop there involvement a back-up should be suggested to YSK or any other NGO who will be involved in supporting these organizations afterwards.

Not training and follow-up visits alone will insure sustainability. There will be a need for continued technical input and advice and possibly modifications and adaptations of the WS system to the (changing) needs of the community. It is not only the activities and involvement of the villagers concerning operation and maintenance of the system which can pose the bottleneck for the functioning of a system as a whole. The technical limitations of the system itself can well inhibit the sustainability of it.

3.3 Hygiene and sanitation

No assessment can be made yet as to the hygiene and sanitation situation within the WS villages. The latrine programme of YSK has just started and in the other villages only one Desa had a PKK latrine programme. Hygiene aspects, water quality, solid waste management etc. are all linked with behaviour. If improvements are desired attention should be given to an hygiene education and/or environmental sanitation programme. These are long-term activities which ask a lot of support and involvement of the communities. The aim of giving water is to improve the health situation and thereby the productivity of the users. If YSK still considers this as one of its specific objectives, they should provide this education not only during the cours at Kuwu, but also during the Desa (follow-up) visits and they should monitor these activities together with the villagers. Support and advise from outside might be desired here by YSK or the NGO who is going to do this.

3.4 Follow-up visits and the monitoring of WS systems

As mentioned before the introduction of a water supply system asks for changes in the behaviour and responsibilities of the local community. Through follow-up visits a monitoring can take place of the condition of the system, the water use and the institutional development. At the same time support and advice can be given. K. Wehrle (1991) has already given guidelines for follow-up visits. On the basis of the field visits executed, a reaction on these guidelines is given. In addition to these guidelines a short manual is given in Annex 5 with more in detail the preparation and execution of these visits. The technical staff as well as the 'tim basis' have been witnessing elements mentioned in this manual.

With regard to the guidelines of K. Wehrle it should be mentioned that form 1 (Evaluation of Village management of Water Supply) and 3 (Effective Use of WS system) are hard to fill-in on this basis. The users groups are very different and they all have their own management which operates usually independent of the rest of OPA. Therefore more information can be gathered on the baisi of detailed assessments per tap and tap user group. Another form can be made for the assessment of other OPA activities and management. Performance of the caretaker ('kader', form 2) and of the system (form 5) are usefull although the information from the caretaker is still limited. With support of YSK (NGO) the performance of the caretaker can be improved for example managing its work and making it more profitable and therefore more attractive.

The forms 6 (Evaluation of Survey) and 7 (Action Programme) should be an integrated part of the follow-up visits and they should be discussed in detail with the community and/or OPA. The development of an action programme of the community should be the core activity of this follow-up visit. Activities as small and large scale repairs, extensions of the WS system or the building of washrooms, have to be planned and their concequences (technical and financial)

discussed. The knowledge and experience of YSK as an respected advice body can function optimal in a supporting role. Therefore it is necessary to make these visits with an integrated team of techiciens and members of the 'tim basis'. As for now none of the PAM's visited have encountered huge problems, whereby great parts of the piping system or concrete constructions had to be replaced. However this is a situation which will arrive, (for example for the iron pipes in acid soil within about 10 years), and the communities should be prepared to face these problems.

3.5 The consciousness (felt need) and interest of the community with regard to additional advice and assistance from outside (YSK or other NGO)

YSK with the support of IC has introduced and implemented several gravity water systems. The technical as well as the management aspects differ greatly from the ways water sources were handled before. Therefore YSK/IC have themselves started an educational process and became even more explicit in the last years. This educational process has been taken over with different degrees of success, by the users groups and the OPA organization in the villages. They try to find out how to keep their systems running, which is the first step in what is called sustainability. For now it is not even clair what sustainability looks like in the long run.

During the field visits to the Desa's it was clear that at least for the users, mainly women, the need for water coming from the taps had developed and they are willing to make an effort to let it continue this way. What is lacking is 'the glue that keeps the sand together'. OPA as well as the users groups operate independently concentrating on their own small issues and apart from formal contact the organization doesn't function yet as a whole. Deliberations among the (male)users only take place when great problems have arisen.

Integrated management, operation and maintenance of a WS system are foreign to most users. What sort of responsibilities they have as owners, are only formaly known but not in practice. Also the newer the system, the greater the interest, but as the systems grow older many problems are treated with indifference and neglect. But the better the users were trained and supported by the YSK technical staff and the 'tim basis', the better they were informed and the motivation to take matters into their own hands had increased.

When the staff members of YSK explained that they were not there to do repairs anymore and they would only pass once or twice a year, the questions of the users became different.
1) The training both for the 'techical kader' as well as the heads of the user groups became an issue. The need for another more appropriate training opportunity was stressed.
2) The financial management was another issue. The need for examples of adapted ways of contributing became clear.
3) The lack of support by OPA experienced by the users groups and the apparent need for it was mentioned.

Another aspect was that the members who had been at the Sarasehan at Kuwu had all tried to do something to improve their situation. They still talked about it and were willing to use examples they had heard during this meeting. But the support they had received after they had come back had been poor.

Lack of information, of alternatives and of an overall view of the functioning of their system within the vilage organisation, makes it ineffective to be able to support the users group and to manage themselves. It is here that YSK or another NGO can intervene to put them on the right track with respect to management, training, repairs, trouble- shooting and with moral support. Most solutions are within the community itself but the existing lines of communication can inhibit the use of this capability. Physical and administrative distances within Desa's can also severely obstruct any improvement of the situation. When the head of OPA is not a user himself or when the decision makers within OPA are not involved, they lack the motivation to manage the WS system except in name. Outside interventions can, when properly done push the development in a next stage.

It is to be expected, as also pointed out by Wehrle (1991) that the occurence of severe problems (great repairs, rehabilitation, extensions, management, financially) can never be handled by the villagers themselves even with a good functioning of OPA. No village can at this moment replace great parts of its pipe network or reconstruct main reservoirs, there is no technical nor financial backup. Although OPA was meant as a self supporting agency, the sustainability is not in its hands. Eventually there are two choises: the first is that the semi-governmental water agency (BPAM or PDAM) will have to take over these systems. The second option will be a local commercial enterprise which can develop from an OPA organisation or as an independent enterprise. In the long run YSK/IC and/or the supporting NGO's have to prepare the OPA organisation for one of these sustainable options.

Coming back to the awareness of the need for assistance and advise from outside, I have tried to show that the need for assistance is there but not pronounced a such. The users are actually just becoming aware of their responsibilities. They are just discovering their lack of information and experience in managing their WS system. This either makes them turn away or they take it up and try to make the best of it. As a lot of the villagers hardly leave their village, especially the women, support has to come to them from outside. The amount of feed-back we got from the villagers during our visits showed that the development and ways of thinking about management of WS systems, has just started to make its way into these communities.

ANNEX 1

TERMS OF REFERENCE FOR PAM MINNIGH

Transmitted by fax on 16 December 1993 by Mr. Peter Winkelmann, Coordinator of INTERCOOPERATION in Ruteng, Manggarai, Flores.

Background

Yayasan Santu Klaus (YSK) has during the past 8 years realized approximately 18 water supply systems (WS) in the Manggarai, which were financed by INTERCOOPARATION-SDC. The projects included preparation, construction as well as follow-up measures in project villages. This cooperation is going to be modified as from July 1994, whereafter YSK will not implement new constructions, but still will preform some monitoring and follow-up tasks in former project villages.

At this phase of cooperation it is deemed necessary to get an overall view about the status of completed projects and the chances of sustainability. The consultant is expected to achieve a number of follow-up visits to project villages and assess the WS as to the present state of physical systems, village organisations for the management of water supplies, maintenance performance, effective use and sanitation.

Tasks

1. Visit 5 - 8 project villages, meet with the village representatives responsible for the WS and with users groups.

2. Assess the present status of physical constructions (water catchment, main pipes, reservoirs, standpipes using samples). Assess the performance of villagers' contributions to contruction in kind and money.

3. Assess the function of the village WS management organisation (OPA, Organisasi Pengelolaan Air Minum). Assess administrative means such as the contract between village and YSK.

4. Maintenance: see whether caretakers were appointed and assess their training and performance. Are waterfees collected, are adequate repair funds available?

5. Assess the function of waterusers groups and the effective use of water, hygienic aspects and sanitation.

6. Enquire into the performance of wells and unforeseen measures for the protection of wells.

7. Documentation findings for each village and make a comprehensive repaort describing general impressions, outlooks on sustainability, main hindrances to an adequate management of WS and ways to improve the

situation. make suggestions as to a future monitoring system.

Added Term:

Assess the concienceness, as to the felt need for additional advice and assistence from outside (YSK or other NGO), of the community

Methods

Interviews with staff YSK, village representatives and users. Site visits, questionair (see example in Report K. Wehrle of November 1991).

Timing

Approximately 2 weeks in January 1994

Honorary

Rp. 200,000.- per day, cost of travel Bandung-Ruteng-Kupang-Bandung, cost of food, lodging, transport and administration according to receipts.

ANNEX 2

MISSION ITINERARY, January 1994

02.01	Travel Bandung - Surabaya
03.01	Travel Surabaya via Den Pasar and Bima to Ruteng. Briefing by the Coordinator of INTERCOOPERATION, Peter Winkelmann in Ruteng
04.01	Visit to Kuwu. Meeting with Gaba Nahat (technical staff), ir. Donatus (technical staff), Aleks Ngarut (technical staff), Br. Lorens Kasmin (Tim Basis), Veronica (Tim Basis) and Pius Jebaru (Kepala Desa Cumbi)
05.01	Field visit to Paang Lembor
06.01	Field visit to Colol
07.01	Field visit to Robek and overnight in Reo
08.01	Field visit to Rura
09.01	Review of activities and documentation
10.01	Visit to Kuwu. Meeting with Tim Basis. Meeting with Pater Waser in Wangkung
11.01	Field visit to Anam
12.01	Office day in Ruteng
13.01	Travel Ruteng-Bima-Kupang. Meeting with Michael West of Binnie & Partners LTD.
14.01	Field visit to Soe. Interview with Mark Heady, VSO water engineer stationed with Yayasan Haumeni.
15.01	Report writing and debriefing by Peter Winkelmann
16/19.01	Travel Kupang-Den Pasar-Surabaya-Bandung
	Report writing depending on the circumstances in Bandung and/or Burundi

ANNEX 3

FIELD VISIT REPORTS OF 5 DESA'S; PAANG LEMBOR, COLOL, ROBEK, RURA AND ANAM

1. General

The assessment done in 5 Desa's is carried out with members of the technical design and implementing staff of YSK and members of the 'tim basis', the extension unit of YSK. A whole day was spend to visit one system involving usually several Dusun's. Starting at the source, most of the piping network was looked at as well as the tanks, reservoirs and other constructions along the distribution network to the taps. However the overall view was more important than each individual detail. Apart from the technical condition, the institutional set-up of OPA and the functioning of THE caretaker ('kader') and the user groups were looked into.

Discussions with village heads (Kades), persons involved during the construction and members of OPA and the water user groups gave information about the actual use and functioning of the system. Usually an overall discussion took place whereby different intervenants were present and information was exchanged between villagers, YSK and the consultant. The inspection of the system beforehand gave enough input for the discussion and different problems were discussed and solutions proposed. A short manual for the assessment as done by the consultant is given in Annex 5. The staff of YSK have been active participants during the visits and the discussions in the villages.

2.2 Paang Lembor

General:
In the Desa Waebangka, Kecamatan Lembor, Dusun Paang Lembor has a separate water supply system which was constructed in 1992/1993. In 1993 Dusun Damar has been connected to this WS-system. Accompanying us during the visit were among others the OPA representatives; the Kades Pk. Dominicus Ogor and the treasurer Pk.Edu who is also trained as 'kader' by YSK during construction.

Source:
The source of this system lies about 40 meters higher than Kampung Paang Lembor, a rather strenuous walk with some narrow crossings. The captation seemed well made but already partly overgrown. The protection area of 100 meters around the source was known to the present villagers but no physical indications as ditches were present. No regulations or agreements have been discussed concerning the total water catchment area of the source which still lies in a forested area. It was mentioned that only trees would be allowed above the source. Along the pipeline towards the village which has laid open some forest already serious woodcutting can be observed.

Water supply network:
The captation and the main pipeline were finished in three weeks time with the help of 2 skilled workmen of YSK and about 80 villagers. The collection box near the source with a build-in sieve (serving also as siltbox) received a reasonable debit which was not measured at this occasion. This box as are the other cement constructions along the pipeline, are well made and the cement well cured, no leakage could be seen. The reservoir in Kampung Paang Lembor has a measured overflow of 1 l/s (enough for 30 liters per day for 2880 persons). Attention should be given to the overflow whereby the waterstream is fierce and can erode the reservoir, it should be lead away on the side. The reservoir on the inside is not painted with water resistant paint but because it was cured properly it is for the moment protected. This reservoir carries also the valves which can close the individual taps in the Dusun in case of repair or disorder. This can prove to be a problem because not all the taps are close by and if the reservoir is considered public property this can result in neglect and apathy towards repairs.

Condition of the taps:
The four taps in Kampung Paang Lembor are all in a different condition. The first (12KK) leaked because the rubber inside is broken. The tapstand and the floor are in good condition and against the fence of bamboo already some plants are planted. Stagnant water should be avoided. The second tap (8KK) functioned well, the waterpressure is sufficient and the condition of the construction is satisfactory. A solid washroom with water basin constructed with the help of YSK is clean and used often. The third tap (22KK) on the outside of this washroom is broken but the tap for the water basin still runs. The fourth tap (18KK) is constructed well but green algea indicate a lot of soap is used for washing and the floor and tapstand are not cleaned sufficiently. The system as a whole is still new and floors and tapstands are solidly build on the basis of the newest YSK designs, it may be worthwhile to follow this system in time.

Group discussion: (present about 20 villagers, about 8 women)
Except for the Kades and Bp. Edu, the four women in their function as heads of the tap user groups were present. All (women) heads of the user groups had received their basic training in Kuwu. They indicated that they had been somewhat confused about the contents but during the discussion they were well aware of the main issues. Except for cleanliness of the environment, regreening and a short practice in tap repair, the main issue they mentioned was the planting of vegetables to pay for tap repairs. Two groups indicated they had planted the seeds and divided their first yield among themselves to be planted again. The next crop they planned to be used as seed, food and for selling to pay for the contribution. Another group said they had made an arisan, (indonesian saving group), with the money they receive from the selling of local goods, 10% should be the contribution for the water supply. Contributions mentioned were; 250 Rp. per month or 1000 Rp. per 4 month, depending of the harvest season. Although every group claims to have a treasurer with a

cashbook, they couldn't show me one and only one group said they had about 17.000 Rp. in savings. The 2000 Rp. per KK per year to be deposited in the OPA fund for general repairs was only payed by a limited number of families.

Furthermore it was mentioned that no real cleaning scheme exists. The family closeby usually takes responsability for cleaning the tapstand area. In his closing remark Bp. Gaba had to explain about the responsabilities of YSK and OPA in relation to each other. It became clear that the villagers still overestimated the input of YSK after construction. This was followed by an appeal of the women who asked for more information which, according to them, had not been enough during the course in Kuwu. This concerned the tap and pipeline repairs, financial aspects as well as on the use of water and the health aspects involved. On the whole the present villagers were very much engaged and interested in the development of the water supply system. They had had their first general meeting and seperate meetings for the water user groups. Still the financial organisation is weak and not well worked out and can therefore cause serious problems in future.

Dusun Damar:
At a distance of about 2 km at the crest of a hill Dusun Damar was visited lastly to see the newly installed tap (three months old) which is connected with the system of Paang lembor. The women present were very pleased with this tap because their source nearby was situated below a graveyard and had in the past frequently lead to illnessess. They were busy with the preparation to build a washroom but it stopt because of insufficient financial means. In the mean time the tap leaked and there had been already problems with a landslide which had broken the main connecting pipeline. The reparation had only been made temporarily. Spoken was also about a contribution in rice or money but no evidence was shown because the head of the user group was working in the fields. The burden caused by the financial debt towards YSK was mentioned also and it was said all financial obligations had to wait until month 7, harvest time.

2. Colol

General:
In Colol, YSK has constructed its WS-system in 1987, which is supplied by three sources: Wae Wejang, Wae Meler and Wae Ie. Three Dusuns get water from these sources; Bitung, Colol and Racang, another will be added later. The ex-Kades Bp. Lazarus Tabung has been head of OPA since 6 years and is a trained 'kader'. He is still active and is involved in the construction of the new extention of the system. He was our main informer during this visit.

Source:
The source Wae Wejang, which supplies 8 public taps, lies near the center of Dusun Colol and is surrounded by coffee trees. In 1978-79, the Desa subsidy was used to make a simple captation of the source which lead only to a big reservoir. YSK made another captation with iron pipes in 1987 with a

distribution through public taps. The debit is very big, more than 15 l/s and has never been measured. According to some villagers the debit has not changed in the past years except for seasonal changes, according to others the reduction was about 50% but because of the large debit it might not have been considered seriously. The surrounding of the source looked clean and the source itself is protected agains floods and leaves by a little wall but is partly open. The land is the property of one person but the cleaning is said to be done by all users once a year. The rule about protecting the 100 meters around the source was known but only for the area above the source. No other regulation are made about the rest of the water catchment area but ricefields or the planting of mais near the source are by common agreement not allowed.

The source Wae Meler lies about 1 km down the road from Colol and was overgrown. It supplies 12 taps and a Parish. The overflow was blocked with a banana, a useless attempt to increase the flow since the diameter of the pipe is fixed. During the visit the collection chamber was opened and cleaned as was the drainage canal. This had obviously not been done since a long time.

Water supply network:
Most of the pipes had been dug-in properly though not very deep. All pipes are of iron and no evident leakage occured. The Wae Wejang has only one collection chamber which could not be opened, Wae Meler has three tanks which were not further inspected.

Condition of the taps:
There was not one original tap left, which is not surprising since the system is already 6 years old. Nearly all taps of Wae Wejang leaked or were just plain open 'pancurans' (open pipes) with freely flowing water. Because this source has such a great debit no water shortage has ever occurred and the need for reparations is not felt. Extensions with bamboo and tubes filling private basins or making pancurans especially for children to wash themselves, are seen as normal. No solid tapstands were made, of the floors not much is left, some taps are protected by a fence, most are not. This system was build before the 'tim basis' was present to train and inform the users groups about organisation, operation and maintenance.

Group discussion: (about 10 men and 15 women)
The discussion was started with the drawing of two maps of the system of Wae Wejang and Wae Meler, by two women. In the end and with the help of the men all taps could be traced as were the heads of the user groups (all men). It was said that no original tap was present anymore and most of the users had made their own provisions, as said before, for example using tubes to fill their private basins. Talking about the use of waste water they indicated that it could not be used in fish ponds because it killed the fish eggs and they were afraid it would kill the seedlings also if they would use it to water plants.

None of the heads of the user groups had received the 'Kuwu' training in this desa (before the start of this YSK programme) but two 'kaders' of Bitung and two of Colol were trained 'on the job'. Of Bitung Bp. Lazarus Tabung and Johan Ngabus are still present. The one set of tools supplied by YSK for repairs for the three Dusuns is still being used. The group commented that the skilled workmen were there for repairs but they are mainly busy with the extentions and the present taps are not repaired anymore, as showed the visit.

For Wae Meler the system is shutdown during the night and opened again in the morning because otherwise there will be no water in the afternoon. One person is assigned to this task and he uses the valve at the reservoir.

For the contributions some regulations were given, 1000 Rp. per year has to be payed to the Kades/OPA for general repairs. Another 500 Rp. has to be payed only if a tap is broken down to get it repaired. No indication was given about the available amount of money in cash and it was said that the contributions didn't come easily. A former financial arrangment whereby families had to pay has fallen apart.

The groups claim that every family in these Dusuns has a private toilet. The example was given through a governmental project and Dr. Ben is the one who has to control the ones build by the community. If no toilet is made or can be found the family has to pay a fine. This activity is under the control of the PKK and the inspection is once a month. The toilet consists of a little cabin and the pit is dug near/behind the cabin and covered with bamboo. Apart from latrines it was mentioned that the community wanted a washroom near every tap. Some already have a private one.

3. Robek

General:
In Desa Robek the planning is to provide 4 Dusuns (Robek, Ojang, Gincu barat and timor) with water from source Rombang 2. The source for Dusun Robek (4 RT's) lies in Desa Wontong/Toe which is situated near Desa Rura. In August 1992 the 4 taps of Robek were installed and the water supply was sufficient but during the visit hardly any water came into the village. When the team visited this Dusun many problems were mentioned.

Source:
A 20 minute walk accross some sawahs encountering some cows, brought us to the source Rombang 2 which supplies Robek. It is a solid construction whereby the water of the source comes from a little cave through a reinforced canal to a collection chamber, further through two pipes in siltbox and from there further to Robek some kilometers from Rura. It was hard to open the chambers closed with iron bolts because of corrosion but the ones with locks were already forced open. There was no public tap at the site of the source. Although it is said that the chambers and the source are checked and cleaned every few months, lots of small roots grew in the canal and in the

chambers. They were cleaned and the roots removed during the visit. The caretaker of the system of Robek, an inhabitant of Rura, has more or less appointed himself but he doesn't feel very much supported by the people of Robek. The debit of the two pipes was measured with the help of a helmet,(estimated volume 1.5 liter). One gave 0.38 l/s and the other 0.25 l/s, which makes a total debit for Robek 0.63 l/s. No one knew if the debit has diminised in the past years.

Water supply network:
From the source to Dusun Robek most of the pipes were dug-in but in the Dusun itself most of them were bare because of erosion and a stony soil. The brake pressure tank (BPT) somewhere halfway between the source and Robek showed many fieldworkers using the overflow of this reservoir to wash their clothes and themselves. The overflow is about 0.3 l/s which is large compared with the total available debit at the source. The overflow is placed directly over the box with control valves and will if not redirected damage the structure.

The main control valve for the pipeline to Robek at the BPT was broken and this can also be an explanation why the debit in Robek is so low. The manholes of the BPT were not closed and spoken was about another design where the lid should be sunk in the construction as should the lock.

We were shown also the place were the main pipeline has been punctured by a nail presumably by children. A provisionally repair with rubber bands was done and at the moment of inspection no further leakage was visible. The reservoir at the top of the hill just above Robek was scarcely filled with water and the debit coming in the reservoir was measured to be 0.05 l/s. One of the reasons mentioned for such a low debit was the occurence of air in the line because of the demolition near Rura. This should be tested by YSK during a follow-up visit in the near future. The valves in the box beside the reservoir are still intact. The overflow is also situated directly over the valvebox which can damage the construction just as at the BPT.

Condition of the taps:
The four taps visited have to supply a total of 60 families (KK). The first, at the top end of the Dusun, still holds a little water but is leaking constantly because of a broken rubber. The measured debit with the tap fully open gave 0.02 l/s. Tap 2 had no water at all. Tap 3 and 4 have hardly any water, it comes in droplets. Tap 3 had some tubes hanging beside it only tap 4 was compleet with a working tap and a fence. The head of this user group is a strong personality and has some authority in the community.

Group discussion: (about 5 men and 5 women)
Two discussions were held, one with some users of the four taps and one seperately with the Kades who lives in another RT. During the first discussion it became clear that although the tim basis had tried hard to get the user groups and OPA started, the results are lacking behind. Four women had been

chosen per RT and not per tap and they had got their Kuwu training but they did not become the heads of the user groups and were only involved in the regreening activities. The heads of the present user groups never received a training. One woman, Ibu Maiarima, had been present at the Sarasehan OPA meeting on 5 May 1993 in Kuwu. On the basis of the discussions during this meeting, she had wanted to take action to improve the organisation of their water user groups but she had received no support for her ideas of the Kades.

Another problem which was mentioned was the payment of food given to the villagers of Robek by Bp. Thomas of desa Rura, the caretaker of their system, at the time of construction in Rura. Instead of only one month the work took 5 months and only 25.000Rp. was payed, enough only for the first month. They tried to assemble the rest of the money themselves to pay him of but the Kades didn't agree. Bp. Thomas had asked for a tap in his yard, a branch of the main line to Robek, during the time of construction. At that time the workers of Robek lodged at his placed and ate there. But why Bp. Thomas had this tap and how he used it not understood and gave reason to speculation. Rura had no water at the time because their system had fallen down. During the discussion in Robek the confusion about this was great because Bp. Thomas continued to use it and was accused of stealing. The direct explanation given in Rura by Bp. Thomas himself was very clear. The food had not been payed and Bp. Thomas had said he would use the water only for his own use and not for his nursery, until the debt is payed by Robek. He himself complained about the conduct of the Robek community because many of the workers came from Robek but they went away soon without doing much of the work and he even doubted if they really wanted the water supply system.

The contribution was another problem. It had to be 500 Rp. per year per KK for the general fund and 250 Rp. per month per KK for repairs. Because of the lack of water the KKs are not prepared to pay at the moment. The women mentioned they wanted the situation to change but did not know how.

The 'kader' who was present said that he had not fully cooperated when receiving his training from YSK because it was not considered necessary. After some explanation during the visit by the tim basis it became evident that the idea and the consequences of being the owner of a water supply system and having to take care of it, was not well understood. A request for another kader training was proposed during the discussion as was the request of the women for an extra training in tap repair and WS activities. However some action had taken place inspite of the weak organisation, at the time of the demolition of the main line in Rura. They had inspected the line and had found the leak (pipe punctured by a nail) which they had repaired temporarily, but no follow-up action was taken afterwards. The tools for reparation which belong to YSK but are still in the possession of Robek, they don't posses their own set yet.

Before finding the Kades and being able to speak to him, the team saw the badly stocked pipes lying around probably already since 1990. Some are bend and corroded and the question arises how the dropping of materials should be arranged to avoid damage but not to increase costs or waiting time.

During the discussion with the Kades of Robek certain problems discussed proved to be heavy. He explained that the construction of the sytem had started in 1990 and was stopped in 1991 to be continued again in October 1992. Payment of the community part proved to be the problem. In the contract with YSK an amount of 13.9 mln. Rp. is mentioned as being the 10% of the budget costs to be payed by the community in cash. According to the Kades this comes to an amount of 30.000 Rp. per KK and this was considered too much. After an initial 1.6 mln. Rp. no additional contribuitons were made. The Kades just recently has proposed, in agreement with the Camat, to use INPRESS money for the rest of the amount in installments of about 4 mln.Rp. per year starting in 1994/95. How far this is feasible could not be determined by the consultant.

Other problems which came up were about the small working force available for the pipe laying and the lack of good food during the construction in Robek for the people from outside. Not mentioned in Robek but mentioned in Rura were the problems which had arisen while laying the pipes through growing crops and the damage this had caused to tabaco and other crops which was not taken into account and refunded. They didn't pay although they had agreed to pay 10.000 Rp. for the tabaco, and therefore had infuriated the people in Rura. Adding to the confusion were the accusations by Robek of foul play by the inhabitants of Rura which remained vaque, but they still determine the way the events are explained. Having a source in one Desa and laying a pipe through another to provide water for a third asks for a lot of communication. This communication with Toe/Wontong, Rura and Robek has not been enough and agreements were not made clear. Problems have arisen afterwards which should have been solved beforehand.

That the demolition of the pipeline by a nail was not reported to YSK considered the Kades as his fault just as the fact that he had failed to report that the source had seemed to be dry in November 1992. In reaction the tim basis has asked the Kades very straith forward to be more supportive in future. He has to start by giving the names of the water users and their availability for the labour force to be able to finish the system in the other Dusuns. Requests for additional training for 'kader' and heads of water user groups were recommended to be send to YSK. Repairs and maintenance of the existing system will insure the credibility of OPA and the water users. If no action is undertaken by the Kades it seems rather useless to support this Desa because it is not sustainable, which is a pity because the actual users of the system, the women, have shown a genuine interest in the system and they are prepared to continue and support it if they get the support themselves.

4. Rura

General:
The WS of Rura was first installed in 1987 with a small collection box and sieve (siltbox) at the place of the source. In 1992 this system was rehabilitated and a new captation was made. Three Dusuns are served, Pring with 5 taps and one reservoir, Rangkus with one tap and at a distance of several kilometres Wae Kilit with 2 taps and one reservoir. The responsible person is Bp. Thomas who takes care of the WS of Rura as well as of the WS Robek and he showed us around.

Source:
The source of Rura lies a little further uphill from the source of Robek. For the new captation a very big tree has been cut down, the trunck is still visible above the cement chamber over the source but there are no other visible elements showing protection. A forest still surrounds the source and the rule to protect the first 100 meters around the well is known but doesn't apply for the sawahs below which were already there before. Protective measures or agreements for the rest of the water catchment area were not mentioned and it became clear that a dicussion about this aspect has not been held yet. The participants claim that there is a little lake higher on the hill at about 2 km but they don't know anything about the water level and if it has changed in last years. Some woodcutting already occurs near the source.

Water supply network:
Most of the system is made of iron pipes but there are some PVC pipes. Part of these PVC pipes, especially those near the source, were bare and this can damage them. PVC desintegrates through sunlight/ultraviolet and temperature changes. No comment on the design can be given because technical data were not available. The main pipeline design seems to be strait forward with a small bridging and one tank to divide the debit for Pring, Rangkus and Wae Kilit. The cement constructions showed no leakage or destruction only the manholes are not locked although they were provided with a device to close them.

Condition of the taps:
The first tap was broken down and it is running and used all the time. The floor, 3x3 meters, is broken and although bamboo protects the place which is also used as washroom, no live protection has been put in place. The wastewater goes to some vanille plants on the other side of the fence. Talking to the women near the tap gave no name of the head of the user group. No knowledge or interest in the users group was shown. They had had one meeting with YSK but payed no contribution. They asked directly for another tap but Bp. Thomas rejected this because he said no effort had been made to repair or maintain the existing system.

Of the other taps visited (K3, K4, K5 and K6) all of them run but all leaked one way or another. K5 didn't have a tap at all. Apparently no maintenance or repairs were carried out for already some time, most of the floors were broken, the fences

neglected as well as wastewater drainage. Many pipes especially near the taps were bare. One tapstand was demolished and only partly repaired when an eel was washed into it, at the beginning even some sweet water shrimps came out of the tap.

Group discussion: (5 women, 2 men)
One of the women explained about the contents of the course by YSK of August 1992. Apart from ideas on how to use water and not to use a tube, she indicated that she never has tried to repair a tap and thought she was not able to do it herself. The vegetables to get money to pay for repairs were used only individually and no cash money was available. Of the men it was said that the two 'kader', Bp. Thomas and Bp. Damas, were given a set of tools for repairs but because they had lend them to others they were not compleet anymore. No recent activities of the 'kader' were mentioned by the women.

Talking about the management of several taps it was said that some of them had had a meeting with the women in the house of the Kades. They spoke about how to protect their tap for example against children. No plastic tubes would be admitted. The head of one of the users groups is also the treasurer and a first payment was made in tabaco which was sold afterwards, it gave them 25.000 Rp. in cash. However this was never repeated and this money can also serve as a loan for members who need it. It was not clear for what the 1500 Rp. per year had to be paid to the Kades and they could give no indication as to the amount of cash received.

Concerning the cleaning of their tap and surrounding one said it had to be done once per week but now it was not possible because of the work. Another indicated that the one close by had to clean it. One group also wanted to have a washroom but the other members said to wait and because this head was young she could not arrange it herself.

Desa Wae Kilit:
This Dusun has 28 families (KK). Apart from the water supply programme a latrine programme has started also. The reservoir at the side of the village has an overflow and the water runs with a good pression at the two taps. The environmental situation in this Dusun is very poor, most yards are not cleaned, and the economical situation seems to be very weak.

The taps leak and although some users said they knew they themselves had to repair them, they still asked the staff members of YSK who were present to help them with the reparation or with money for replacement of the tap. Talks about a contribution had been held but none of the users wanted to cooperate according to one of the heads of a users group. They said that they could pay in labour but not in money. On the whole the organisation was very weak.

The latrines we saw were very new, well build and, according to the information given, well used by the young and the adults. The latrine as well as the cover of the pit are made of bamboo but the pit is not further protected against small

children walking loose. It is a new activity and its effects at present are hard to assess accept that it is a first attempt to involve and educate the population in this remote area.

5. Anam

General:
Dusun Anam is part of Desa Bulan and we were received by Bp. Gallus Jeramu, the head of the primary school and member of OPA. The system was finished in 1989 for 159 families and has 2 reservoirs, one siltbox and 13 taps with between 7 and 31 KK of which one is for the church, 1 for the health centre and one for the school. This schoolhead has a whole archive on the PAM. After the Sarasehan in Kuwu some changes were made, the old commitee transformed in OPA. Of Desa Bulan another Dusun, Dusun Bung will be served with a seperate system made by the PAM DELSOS.

Source:
The source is situated at the side of a hill. A narrow and slippery path leads via a forested area and some ricefields to a low concrete box at the top of some open fields. Over the source the hill holds many trees but the afforestation is not dense. The owner of the source has only officially given the place of the source (concrete box) to the community. In return he has receive a tap near his house and he and his family don't have to pay the monthly contribution. The forest above the source has several owners and discussions about protecting a range of 100 meters around the source or about the whole water catchment area were not concluded with clair agreements. The status of the Desa forest has also changed during the last years. Not long ago someone has been caught who had cut wood here and he was beaten up and had to pay a pork as fine according to the adat verdict.

The source is completely covered with concrete, there is no manhole which can be opened for control. There is no tap available for the people who live near the source but there is an agreement that not all of the water goes to the Dusun but part remains for the ricefields. One pipe arrives at the siltbox and two leave it, one for drinkingwater and one for the fields below.

It was said that the small path leading to this souce had opend part of the area and now woodcutting already takes place along this path.

Water supply network:
The main pipe is layed in the path. More than 50% of the iron pipes are bare because of landslides and erosion. One gully crossing is made and at the side the pipe is leaking although it was temporarily repaired with rubber bands. Of the first reservoir with seive the manhole is closed with cement as a result of a meeting in the village after stones were thrown into it. The lid of the controlbox with the valves has disappeared and all the valves are bandaged with rubbers. This

reservoir has never been cleaned and the participants didn't know how to do it. No overflow is visible as in other more recent constructions, according to the technical staff it is inside and flows underground to an outlet.

Condition of the taps:
Of the 13 taps we saw all of them were made with a high but not reinforced tapstand. It was done to prevent children to play with the water but the result was because they couldn't reach it that they were hanging on to them which damaged them even more. There are 8 taps broken of which 1 broken off totally and 2 can't be closed. Five of the taps are bound up with rubber and only two taps functioned properly. Most of the places didn't have a fence and most of the drainage systems against stagnant water on the floor and around the tapstand were not present. In one case a plastic tube was used. It was proposed by the YSK to OPA to close and dismantel the taps which are running and are not repaired, but this has not been done yet.

Group discussion: (8 men and 4 women)
The discussion started with the organisational changes made after the Sarasehan in Kuwu. Apart from setting up OPA they decided during a village meeting to change the contribution from 200 Rp. (since 20/8/89) to 250 Rp. per KK per month. There is no management of cash per tap but it has to go to the treasurer of OPA. It was reported that in July and August 1993 the members payed and a list of paying members is available, but in September they refused to pay. The OPA members said that after a while they want to try to collect the money in a house to house campaign. It was also mentioned that before the money for taps repair was given voluntarily when necessary.

Two 'kaders' were trained during construction of the WS system but tools for reparation are not available, they do only emergency repairs. It was said that cleaning the facilities should be done by everyone but in practice it is the duty of the wife of the head of the user group.

The heads of the user groups are all men. One of the questions is if YSK cannot give this Dusun (OPA) a list with prices of spare parts for the system which can give them an indication if they have to replace certain parts in future. They also indicated that is better control and cleaning system should be put in place to insure longer life for the system.

ANNEX 4

PHOTO REPORT OF THE FIELD VISITS

1. Source of Wea Wajang, Desa Colol, both bamboo and iron pipe
2. Public tap in Desa Colol, extensions with bamboo
3. Latrine, project PKK, Desa Colol
4. Source and chambers of WS Desa Robek in Wontong/Toe
5. Seive of the Siltbox of WS Robek
6. Reservoir of WS Robek, overflow
7. Public tap of WS Robek, with plastic tubes
8. Public tap of WS Robek, the well managed tap
9. Public tap of WS Robek, different tap
10. BPT, between Rura and Robek, washing field workers
11. First public tap of Rura, floor with tap
12. Reservoir in Kampung Wae Kilit, Desa Rura
13. Latrine of YSK in Kampung Wae Kilit, Desa Rura
14. Reservoir of WS Anam, open box with control valves

ANNEX 5

GUIDELINES FOR MONITORING AND FOLLOW-UP VISITS

Introduction:

These guidelines are not formulated to replace the guidelines given by K. Wehrle in his report of November 1991, but they should serve as a supplement and practical entrance point on how to work with a team and how to address the villagers. The outcome of a visit is not only the evaluation itself but an assessment of the situation combined with a next step in the learning process as to how a rural WS system really works and how villagers and intervening team members stand in managing and supporting it. The exchange of information has to give feed-back to both the team as well as the villagers how to go on in making their WS system sustainable. What sustainability means in the long run is still unknown and no blue print is available. What remains is that every community will develop according to its own capability and his own identity and therefore a WS project coming from outside is part of this development and as such an active actor which has to be a partner and support it along the way.

Assessment methodology:

1. **Briefing of the team**
   The team which will take part in the follow-up visit (monitoring/evaluation) should be briefed upon the following aspects.
   1. The visit should not be pressed by the team members. The team has to see what takes place within the community and they have to listen more than to talk. They should be aware they have to observe what is going on amongst the villagers and between themselves and the villagers, to find out about the actual use of the WS system and the problems involved.
   2. The team should prepare certain questions, for example according to the guidelines of K. Wehrle, but in asking them not indicate the answers. Techniques will be mentioned below under no.6, they are known as simple participatory rapid rural assessments methods.
   3. It might be helpfull to bring a camera to take pictures of the sources, constructions and tapstands visited, especially in view of the discussions about changing landuse and deforestation.

2. **Introductions and planning**
   The village has to be informed about the visit beforehand especially the Kepala Desa (village head), the members of OPA and the tap committees. In the planting or harvesting season many villagers will have gone to the fields after 10 o'clock. An overnight stay is recommended to facilitate discussions which usually take more than 2 hours and involve many different groups and users.

3. **Visit to the source**
   Upon arrival in a Desa usually the men of the village

will receive the team. After proper introductions the men, including the Kades, members of OPA and the 'kader' can be asked to accompagny the team to see the source of the WS system. This is not only meant as an inspection of the infrastructure along the route but also to get the men talking about the history of the system, the technical management, the technical problems and the operation and maintenance. Of interest is also if they know about the protection of the source and the water catchment area and what influence woodcutting has on the debit. Questions about landownership, protected desa forest and adat rules and how this changes in time should not be forgotten. It can be a long and tough walk but worthwhile and it can show appreciation of the efforts made by the community at the time of construction and afterwards. Be prepared to open reservoirs and other constructions/chambers/tanks and bring tools and oil to do it. The men who go along usually end up cleaning the area of the source, tanks, control boxes and reservoirs.

4. **Inspection of the physical constructions**
It is very usefull if you detect certain problems to ask about and discuss them directly upon detection. Only after reflextion by the villagers themselves or during the groupmeeting suggest solutions for improvement. When visiting the tanks, reservoirs, breakpressure tanks etc., points to watch or to measure are:
- overflow; amount/debit and were the water comes out (use, drainage; it can also erode the tank itself in the end)
- connection of the pipes to the reservoirs and other constructions, incl. overflow and washout
- cement structure and leaks or wet spots
- conditions of the valves, taps, ventilations pipes etc.
- cleanliness and accessability of the construction and its surroundings
- intentional demolition of system elements

5. **Visit of the taps and the washrooms**
To visit the taps and washrooms should if possible be done directly after the visit of the source. Remarks about the functioning of the user group and encountered problems should shortly addressed and these points should be part of the group discussion afterwards. Points of attention:
- condition of the tap; original tap, replacement, leaking or running continuously or repaired with rubber bands etc.
- condition of the tapstand and the floor/platform
- presence of protective measures such as fences, paved entrance, drainage, waste water use, etc.
- tap use; presence of selfmade extentions, tubes, containers, cleanliness, etc.
- use of waste water

6. **Discussion with the user groups and members of OPA**
If the visit to the source was mainly with the men it will be easier to ask the women to attend the discussions. A private house or one of the adat houses are suitable locations. To encourage open discussions it is usually better to avoid the house of the Kades. To try to let the women talk is one of the first objectives of this meeting but it should not be forced, just encouraged. The discussion in the local language is preferable even if the monitor or evaluator comes from outside, staffmembers of YSK can always translate. It is important to know what is said but even more what is not, to know how the system is received and functioning in the community. Several questions which can evoke a discussion are:
   - the drawing of a rough map of the existing WS system from the source/spring to the taps, women can make this as well as men. Which user groups exist, who is the head of the group, what is the condition of the taps, were are water shortages, leaks etc. can afterwards be asked on the basis of the map
   - asking the women about the contents of the course given by YSK in Kuwu. What is it that they remembered, what was of interest, what was not clear and what information do they use in managing their tap
   - instead of asking about the financial arrangements it is better to start asking, on the basis of an existing problem a.o. a broken tap within their system, what is the procedure to get this tap/leak repaired.
   - other questions about problems encountered can also be posed on the basis of the findings during the visit
   - at the end of the discussion it is good to point out the role of YSK in a follow-up phase and the role of the community itself. Propositions and agreements for the next period (Action Plan), for example the next 6 months should be put on paper (see Wehrle, 1991) for the community itself and for YSK. This is also the point were suggestions of the YSK team can be made to be discussed as ways out of their problems. An exchange of ideas and approaches at this stage can greatly help the community and YSK in finding new ways to manage the WS systems and to make them sustainable.

7. **Debriefing with the Kepala Desa or Tokoh Masyarakat**
It is advisable to have a few last words (usually after lunch or diner) with the Kades, head of OPA or other representatives of the community. A summary of the discussion, the problems mentioned, propositions, ideas and agreements should be made and the activities which have to follow should be discussed especially in relation with YSK. This can lead to written request to YSK (or another intervenant like a local NGO) for repairs, training, trouble-shooting e.o.

Points as the OPA organisation and management, the yearly Sarasehan at Kuwu and other organisational issues can be discussed more into detail. Because after a while the reparations needed will become bigger, pipes get broken, reservoirs can break or leak etc. more pressure will be felt at this administrative level and at this moment neither YSK nor IC has the means or the intention to help these communities in this respect. They have to look for external help, NGO's, Government etc.

ANNEX 6

WATER SUPPLY PROJECTS (PAM) OF YAYASAN ST. KLAUS - KUWU FINANCED BY INTERCOOPERATION

A. WS SYSTEMS CONSTRUCTED

1. Desa Nanga Labang
2. Desa Benteng Jawa (Tengku Leda)
3. Desa Cumbi (Lait)
4. Desa Kakor / Lalong
5. Desa Gunung / Lete
6. Desa Golo Langkok
7. Kelurahan Pau (Cewonikit)
8. Desa Uluwae (Colol) *)
9. Desa Bulan (Anam) *)
10. Desa Rura *)
11. Desa Popo
12. Desa Wae Bangka / Wae Kanta / Pong Majok
13. Desa Pota / Nanga Mbaur / Nanga Mbaling

B. WS SYSTEMS UNDER CONSTRUCTION

14. Desa Liang Bua
15. Desa Golo Meleng
16. Desa Robek *)
17. Desa Bari / Mbakung
18. Paang Lembor *)
19. Werang

Explanation:

Desa : Monitoring by YSK
Desa : Follow-up by YSK
*) : Desa visited by the Consultant