THE DYNAMICS OF WATER USER ASSOCIATIONS IN A LARGE-SCALE IRRIGATION SYSTEM IN THAILAND

ABSTRACT

The management of a large-scale irrigation system requires the co-ordination of activities among various groups and individuals. The establishment of such a system does not only consist of constructing infrastructure and planning optimal water allocation, there are also a range of fundamental socio-economic changes involved which had often not been sufficiently considered during the planning stage (DIEMER & HUIBERS 1996, p. 2). The explanation for this lies partly in the unpredictability of socio-economic development and also in the extended time frame of social organisation which lag behind technological change. This ”cultural lag” surpasses common development project time frames, some would refer to a period of at least 50 years for socially stabilising the irrigation system (LUSK 1991, p. 86).

The enthusiasm and belief in technical innovation in former times (1960s and 1970s) was connected to an optimism of the water management on tertiary level in so far, as it was expected that ”...water control on local level would automatically evolve, simply because it was needed” (FREEMAN 1991, 42). The problem of not knowing how social systems will react to changes and how they will perform in a new setting can not be eliminated totally due to the uniqueness and complexity of socio-technical systems. However, experience with irrigation projects is growing and might be helpful for better planning future changes in irrigation systems.

This paper deals with the evolution of Water User Associations (WUA) in a large-scale gravity irrigation system in Thailand. The WUA have been implemented starting in the late 1980s by the national irrigation agency, the Royal Irrigation Department (RID), to organise farmer governed O&M on tertiary level (one WUG for one service unit) while main system O&M has remained under the regime of RID. Farmers organisation has been initiated by RID officers, prescribing organisational structures and O&M fees collection. Continuous support has been restricted to pilot service areas.

After having existed for more then a decade, conclusions on the sustainability of farmer associations can be drawn without waiting for another forty years to pass by. It could be observed that the adaptation of legally prescribed organisational structures has been only valid for a minority of the service units and some general weaknesses of these structures can be observed. On the other hand, a multitude of informal organisations have developed which show ways for improving participation of water users.

A major assumption underlying this paper is that farmers motivation for participation is a pre-condition for the sustainability of WUA. The actual participation situation, the motivation factors for participation, and the environmental and dynamic influences on farmers motivation for participation are analysed.

1 THE CASE STUDY OF PHITSANULOK IRRIGATION SYSTEM, THAILAND

The observations and conclusions drawn here are based on data collection, interviews, and observations in Phitsanulok Irrigation System in 1996 and 1997, an RID managed irrigation scheme conveying water to the rice-based farming systems of approximately 30,000 water users on 91,580 ha of potential irrigation area. The project construction lasted from 1977 to 1985. The system started to operate in parts of the scheme before

completion, in 1983. A characteristic of the irrigation scheme is the long and narrow shape and a correspondingly long main canal. The length of this (179 km) and some lateral canals (up to 89 km) in combination with low gradients imposes problems on the management of the main conveyance system insofar as the frame for timely reaction to actual water delivery inadequacies – local water scarcity or excess water - is very narrow.

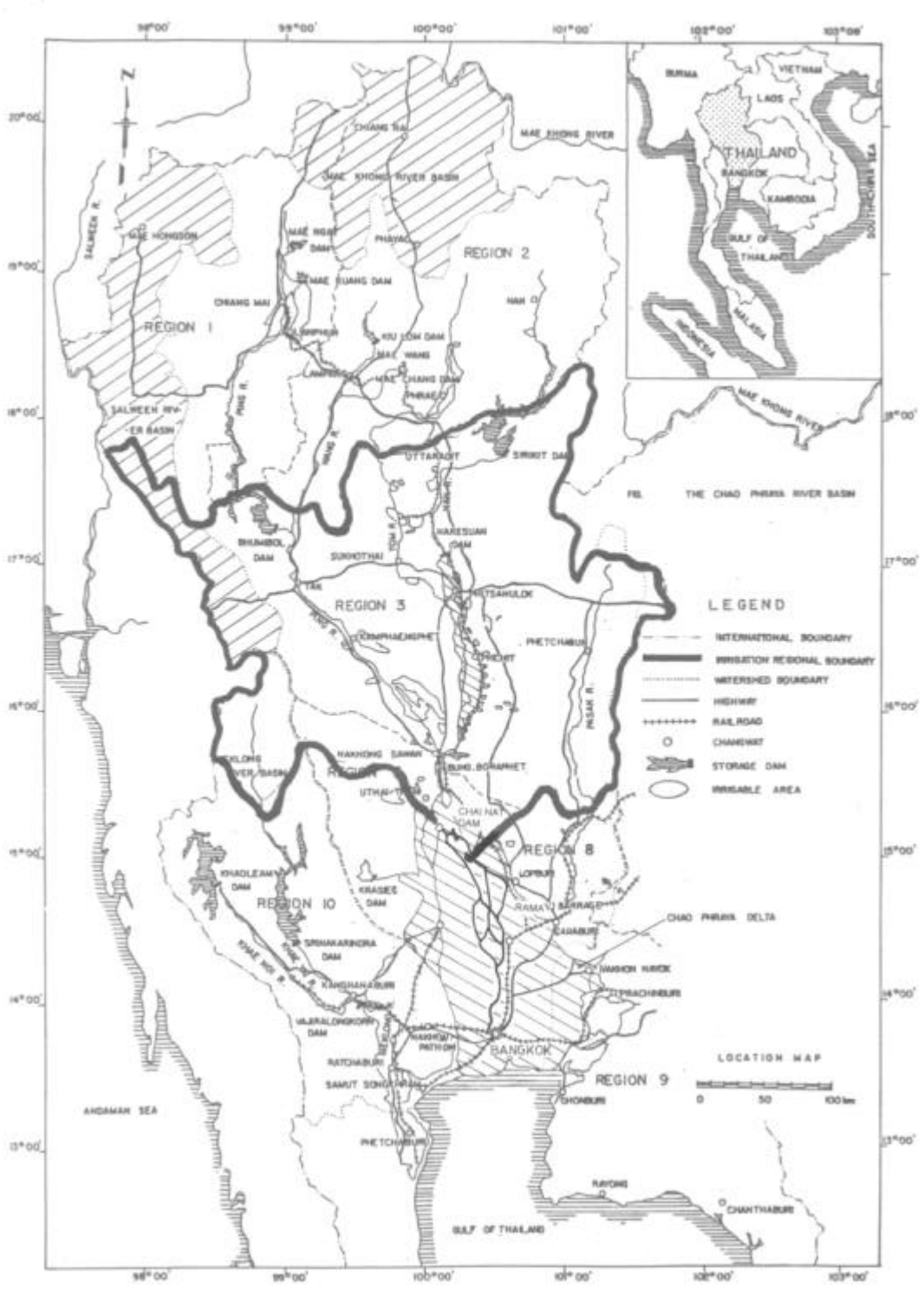

Figure 1: Phitsanulok Irrigation System

The issue of organising farmers was considered by establishing two types of WUA at different distribution levels, at tertiary level and at an intermediate level.

1.1 Water User Associations at Tertiary Level – Water User Groups (WUG)

Water User Groups (WUG) were formed at the lowest distribution level of the irrigation system, for the canal system which directly divert irrigation water to the farm plots. The land ownership of the command area of one farm ditch determines the membership in one WUG. At the initiating stage of organising water users, the land owners were called to a constitutional meeting to sign a membership form under supervision of irrigation agency officers. At this occasion, a chairperson as well as an assistant of the chairperson were elected. This process started with single cases in 1983 and ceased in 1990. In 1992 a total of 513 WUG was recorded which is about 40 % of all service units (Royal Irrigation Department – Regional Office 3 1992). The remaining 60 % of service units, most of them in the tail region of the irrigation system, have never been formally organised. There are approximately 1,120 service units in the irrigation area with an average service area of 82 ha for an average of 26 water users.

The organisational set-up including the definition of an appropriate fee for financing tertiary level O&M has been prescribed by the Land Consolidation Decree from 1974. According to this legal document, owners must contribute that fee and provide necessary labour force for maintenance. In reality, though, this regulation is barely enforced because the WUG do not provide any legal authority for fee collection by the chairpersons. Exceptions were only found in pilot areas where RID officers continuously exert their influence to support WUG leaders. Commonly, WUG have not been guided for continuous work. Up to now, they fail to play a role in operation and a minor role for organising maintenance. Still, there has been created a sense of membership in the group of water users of a service unit which contributes to the organisation of maintenance in rather informal ways.

1.2 Water User Associations at Intermediate Level – Water User Co-operatives

In some areas, for larger commands comprising about 40 service units (WUG), Water User Co-operatives (WUC) were founded according to the Thai legislation for agricultural co-operatives. Membership in those co-operative is not compulsory, so the membership rate varies very much from co-operative to co-operative. Nine of eleven planned WUC have been erected so far in the head-reach sub-system of Phitsanulok Irrigation System[1]. They unite 26 to 503 members representing 2 to 37 % of the farmers of the respective co-operative area. RID strongly supports those co-operatives in administration and organising meetings to compensate a major failure of the WUG: The lack of formal structures to collect and administrate the O&M fee. It is even considered to make the payment of the O&M fee to the WUC not only compulsory for the actual members but also for all water users. By now, the WUC do not seem to be sustainable as an association of water users since the major incentive for membership is the possibility of obtaining subsidised inputs and credits and to receive a profit share from the credit and marketing activities of the co-operative.

[1] The total irrigation system area is divided into three parts from head to tail. Also for the other areas, WUC have partly been established.

If one day the WUC were supposed to be strongly involved in intermediate level irrigation system management, their organisational structures would have to be changed fundamentally with a stronger responsibility to the groups of water users at tertiary level and a real influence on the main system management. By now, the WUC are neither represented in decision making by the irrigation agency, nor do they fulfil any O&M tasks, so they will not be included in the following analysis of status, threats and chances of WUA in Phitsanulok Irrigation System.

2 INCENTIVES AND MOTIVES FOR PARTICIPATION IN WATER USER ASSOCIATIONS

When talking about organising farmers, this can not be a one-time process of establishing organisational structures. Activities undertaken by persons not forming part of the local rural communities of organising farmers' groups are always intruding into existing, mostly informal organisational structures. This intrusion results in different adaptation processes of the new organisational type. With time proceeding, the established organisational form will change. Continuous participation of the members depends on the individual assessment of the advantage of participation in comparison to non-participation.

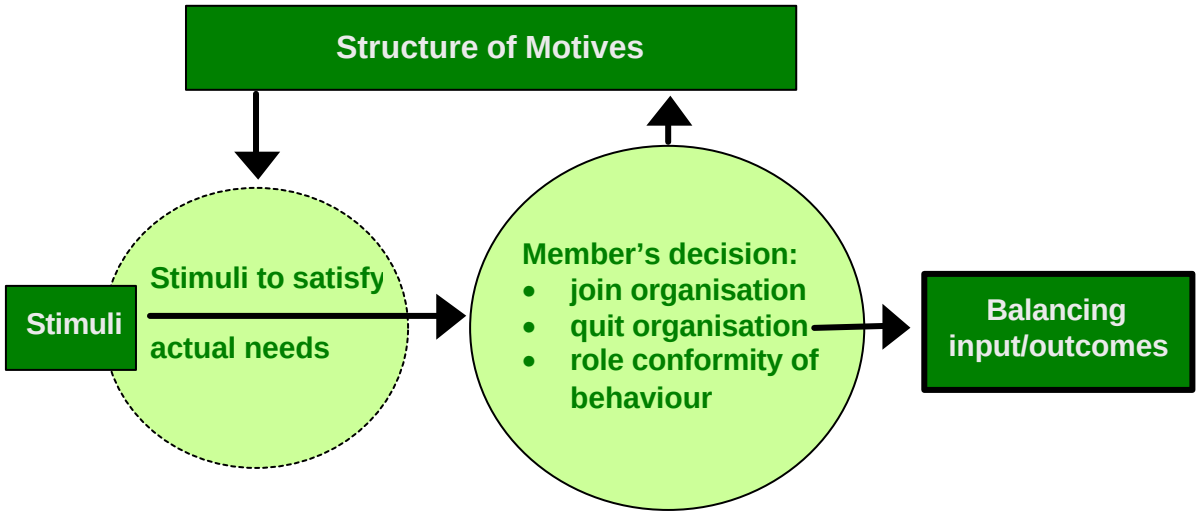

Figure 2: Farmers Contribution to the Farmers Association in Response to Stimuli (based on BARNARD (1938) and SIMON (1947) in HENTZE (1991))

The question of a successful farmers organisation is not restricted to the membership in an association, the decision whether to "join an organisation" or "quit and organisation" (Figure 2). A successful farmers association has to be sustainable (RDI 1995, p.1), meaning that members do not quit the organisation and perform in conformity with their roles. For the different phases of the life-cycle of a WUA, different factors influence the membership and participation of farmers. Apart of positive factors for participation there is unfortunately also a wide range of factors negatively influencing participation in farmers association.

Table 1: Positive and negative factors for participation in WUG

type of need	incentives and motivators	disincentives and frustration factors
economic needs: existence needs and economic security	income increase related to participation	• no/insufficient income/security increase through participation
	an increase of security of the economic system for the farm household	• income/security increase also without participation • alternatives to WUA activities more effective
	represent the diverging individual interest against other individuals	individual diverging interests not represented in group
	influencing environmental conditions[2] via channel of a group representative	• the environment does not react to group claims • the environment does not respond more to group than to individual
	financial reward for activities for the benefit of the group	no reward for activities for benefit of group
social needs: relatedness needs and growth needs	socialisation need, the urge to be member and not outsider	• membership not/no more important because other social units are more important • the group of outsiders is also strong
	the sense of having common interests	• experience that others have different interests • change of interests/ loosing common interest
	feeling stronger in the group, also related to a strong group leader, to influence the environmental conditions	• disappointment with the success of the group leader or the success of the group • no need for influencing environmental conditions • no expected benefit in influencing environment
	a forum of achieving fair treatment and obtaining a fair share of benefits, either by consensus or through the authority of a leader	• perception of being treated unfair by community or leader • envy for benefit received by other members • lack of authority of leader
	receiving acknowledgement for activities within the group, e.g. by becoming an elected representative	• envy for acknowledgement obtained by other group members • loosing acknowledgement once obtained
behavioural needs general security need to strive for avoidance	preservation of economic security by not being excluded from the local mutual assistance network	• the local social security system is independent from the group membership • outside social security systems develop • the local mutual assistance network has failed
	preservation of social security by avoiding threats from group members	• group pressure in case of non-conformity not perceived/not experienced as a threat

[2] Environment comprises the elements surrounding the farm/household: economic, ecological, political and social environment

During the phase of establishing WUA, the incentives and motives refer to expectations of the individual from the organisation rather than to experiences. Positive fulfilment of those expectations, at least for some crucial elements, is the pre-condition for the persistence of WUA. Negative factors might be known from the beginning but others evolve over time. Serious problems occur when **negative experiences** are made, for example when the WUA does not create the expected increase of justice among the water users. Those disappointments are dangerous for the sustainability of a group which commonly irreversibly generate a negative attitude towards an organisation. To repair a damaged community is more complicated than creating new structures.

Individuals might have joined the WUA expecting advantages from this and certainly not expecting any disadvantage for their own position. To submit to collective action by complying with the role-conform behaviour comprise two aspects: 1. to allocate household resources in group activities and 2. to co-ordinating individual irrigation activities with the WUA. Collective action thus is more expensive than individual action and it limits the liberty of the individual which he would choose to avoid (LUSK & PARLIN 1991, p. 14). A possible reaction to this situation is to firstly test whether there is a difference for their personal benefit if they behave in conformity with their assigned roles or not. If the individual boycott is not sanctioned this will be an example for other farmers who might also retreat, raising the risk of conflicts among participants and free-riders.

The counteraction of positive factors, referred to as the **incentives** or **motivators** to join and participate in a WUA, and the negative factors, referred to as **disincentives** and **frustration factors**, are presented in Table 1.

Based on the motivation theories for human behaviour it is assumed, that the individual farmer seeks to satisfy simultaneously individual and household needs. Environmental conditions, the individual/household situation, and the impact of the irrigation system and irrigation organisation on the individual/household situation are assessed towards fulfilling the needs of the individual or the household. It is differentiated between economic needs, social needs, and behavioural needs. This grouping is based on the content theories of motive structures which are rather descriptive motivation theories. These needs might also be labelled as general motives which are addressed by motivators for participating in irrigation organisation.

2.1 Economic Needs

The economic needs comprise the physiological needs (primary needs) according to MASLOW (1970 in HENTZE 1991, p.30), the existence needs according to ALDERFER (1969 in HENTZE 1991, p. 31) and the extrinsic need ”income” according to HERZBERG (1966 in HENTZE 1991, p. 33). In short: The individual expects an overcompensation of his/her input to the WUA finance and activities. An increase of income security is an equally or maybe even more important economic gain in comparison to the level of potential average income increase.

The expectation and the experience of achieving economic benefits from the irrigation system is a prerequisite for participation in a WUA. This major motivating factor for participation is counteracted by three possible negative factors in the individual scenario:

1. The experienced benefit is not related to participation. Non-participation is not sanctioned, so especially head-reach farmers receive their beneficial share of water also without contributing to the WUA activities.

2. The expected or experienced benefit is insufficient, a situation especially relevant for tail-end farmers who are more likely exposed to unreliable water deliveries.

3. Benefits from participation in WUA can be substituted with other activities which are considered cheaper, more comfortable, and/or more effective.

"To disconnect farmer payment of assessments, whether in cash or kind, from water delivery is to virtually invite free ridership and organizational decay" (FREEMAN 1991, p. 55). This central logic of FREEMAN's observation of irrigation systems in different continents is related to the three negative factors as listed above: Free ridership is the starting point of the "organizational decay" inducing or strengthening the negative factors No. 2 and No. 3.

Economic factors can also be the main drive for participation with the "social" purpose of exerting group pressure against outsiders, like other group of farmers or the irrigation agency, or for avoiding to be an outsider, whose interests are not represented. Homogenous as well as diverging interests might drive farmers to participation but only as long as they perceive and experience that the group existence and the individual participation has a positive impact on the personal situation.

The major problem of participation is to take collective action with the free-willing participation of all members. In an inhomogeneous group, people are more or less reluctant to join work activities, e.g. local leaders like village headmen would not simply work together with the group of "common" farmers in the canal shovelling for maintenance. It is quite common to collect a fee instead of participating personally. This system might be extended to pay those who are willing to work more than their required share. Such a financial reward system tends to be more sustainable than a purely honour or group-feeling bases system which is rather based on short-term enthusiasm. It offers incentives for allocating labour resources of the group of farmers according to availability and skills and transparency for the individual contribution to the collective finance and activities.

2.2 Social Needs

Social needs are quite a wide range of needs concerning the individual position within the community. The more basic social needs are the relatedness needs (related to ALDERFER in HENTZE 1991, 32) which covers the need of the individual to be part of a group, the basis for a sense of community. The general development of the opening economic systems in rural areas of Thailand is connected to a loosening of community bonds at any level of social integration but they are still comparatively strong in relation to developments in urban areas.

The most important community[3] for the farmer is the family, followed by the village community. The social ties of water user communities are normally less strong than

[3] Ethnical and religious groups can be of major concern for social coherence, social conflicts and even directly for irrigation management, like in the Subak-system of Bali. In the rural Buddhist communities of Thailand they support the village communities.

those of family and village, so the need to be a member instead of an outsider is stronger if WUA members live in the same village. Inhomogeneous groups from different villages and with a significant share of land owners not living nearby, e.g. from municipal areas, tend to be weaker in terms of solidarity.

The sense of common interests is a very strong factor for joining a WUA, e.g. if the group wants to enforce more water from the agency or against farmers not forming part of the WUG (outsiders). The awareness of common interests diminishes in the course of time. A deterioration of farmers solidarity with disadvantaged downstream farmers was also observed in South India (MOLLINGA & BOLDING 1996, p.29). In the absence of common problems affecting the interests of members the motivation effect of common interests turns to zero. Farmers in Phitsanulok Irrigation System do rarely expect the WUA to address their irrigation related problems, they do firstly see themselves capable to solve problems individually (Table 2).

Table 2: Identification of the most important person or institution for solving water related problems of farmers from selected areas in Phitsanulok Irrigation System

	irrigation agency		WUA		village headmen		farmers themselves		politicians	
	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
head sub-system	28	31%	1	1%	17	19%	42	47%	1	1%
middle sub-system	17	34%	0	0%	6	12%	21	42%	6	12%
tail sub-system	37	29%	1	1%	37	29%	48	37%	6	5%
total sample	82	37%	2	1%	60	27%	111	51%	13	6%

A special case occurs when a former common problem ceases to exist for part of the members. Two developments in the communities of irrigators have had such an effect in Phitsanulok Irrigation System: Mechanisation plus changed planting methods have substantially reduced the need to co-operate in agricultural production. The application of groundwater pumped from private wells has created a certain degree of independence from irrigation system water for a large share of farmers. Although farmers generally prefer to obtain water from the cheaper gravity system, there is drastically reduced willingness to allocate household resources in the commonly managed irrigation system which in fact lies beyond the individual and WUG control.

A positive factor for participation is the aim of individuals to seek fairness by democratic ways. This requires the perception of an unfair treatment of the individual in the absence of community representation. A homogeneous group of small-scale, comparatively poor farms is the most promising constellation for such a group. The need for strength is obvious, common interests against richer and/or more influential competitors for resources are easy to define.

In the course of time equality perception tends to deteriorate because individual interests are being pursued, e.g. simply by the more or less advantageous plot location in terms of irrigation water. This requires conflict management by strong leaders of a necessary degree of natural or institutional authority.

In Phitsanulok Irrigation System most service units are characterised by heterogeneous farm and income structures. The factor of common interests under such circumstances are limited but disadvantaged farmers may seek democratic justice within a farmer association. A source of frustration in this constellation has been the inability of WUG to control richer and more powerful farmers. It was reported that in single cases more powerful persons improve their own situation by assuming leading roles in WUG. As long as democratic principles are overruled in rural societies by patronage relationships and bribery, the representation of the interests of disadvantaged farmers can hardly develop. Small-scale, poor and/or tail-end farmers are frustrated and advantaged farmers do not need to compromise.

The growth need of human beings as the third element of ALDERFERS ERG-Theory (**e**xistence needs, **r**elatedness needs and **g**rowth needs) is a set of higher needs, summarising the self-esteem needs, ego-needs and self-actualisation needs described by MASLOW (SCHOLZ 1993, p. 419) which here is only related to in the social context of a WUA.

Some individuals are stronger motivated than others to follow higher goals by delivering economically non-rewarded work for the community. Patronage in the traditional sense of Thai society requires that the more powerful of a community represent the interests of the less powerful, probably economically dependent society members, against outsiders. So, besides being the source of unfairness, the uneven distribution of farm land and income might also bring forth a stable social structure of strong social leaders and followers who trust these leaders to act for the common benefit. In the process of individualisation and opening economic systems there is a tendency of more competitors in the rural society with more players, but less room for benevolent patronage for the really poor, a group which in Phitsanulok Irrigation System is getting rare. A reliance on the rural patron system might turn into a social time-bomb (see also RABIBHADANA, 1993).

2.3 Behavioural Needs

The last aspect is a link of economic and social needs under consideration of the conservative attitude of human behaviour in their efforts to preserve existing social links instead of seeking totally new relationships. Based on empirical analysis, MCCLELLAND (in SCHOLZ 1992, 424) has defined two features of human behaviour as counteractive to performance orientation of employees: the need to be member and find social security within a group, and the effort to avoid unpleasant incidents.

This conservative attitude, here summarised as " behavioural needs", is ambiguous for the success or failure of a WUA. Positively, social relationships once established can be maintained despite of problems. Negatively, new relationships are ranked less important than existing relationships avoiding the evolution of a tight community of persons with heterogeneous backgrounds and community links. This conservative attitude also inheres the risk of insufficient openness to new members. It was found in the study area that heirs of the farms or immigrants were not integrated in the WUG.

The motivation factors derived from the assumption of a prevailing behavioural need is the fear of disintegrating from the rural community and thus maybe also loosing economic security. Opposing the community leads to hardship for the family if it is exposed to hostility, maybe even to physical violence. On the other hand the environment of the WUA might also exert opposing pressures, e.g. by an influential personality whose interests run against the WUA interests.

In general, the behavioural needs are the motivators for farmers to maintain a stable status which initially supports the tendency to follow the majority of community members and to follow orders from acknowledged authorities, e.g. RID officials, village or sub-district headmen, or other regional leaders. This is the behaviour to date prevailing with the side-effect, that community activities need some kind of supervision.

In the long run, the conservative factors loose their influence on the decision. The social, economic, and demographic features of the farm households have a strong influence on the conservative attitude. Fundamental changes might need a new generation of more progress and growth oriented younger farmers. Any farmer is open to gradual changes which do not inhere the risk of total failure but of slight improvement. Above all, the economic assessment will dominate the future development of participation. Social benefit assessment will also play an important role but only if a minimum of economic benefit is realised.

The motivation theories give clues on the interaction of the different types of needs according to an order of needs (MASLOW in HENTZE 1991, p. 30), the constellation of need fulfilment (ALDERFER in HENTZE 1991, p. 31ff), the counteraction of motivation and frustration (HERZBERG in HENTZE 1991, p. 33ff) and the personality feature of the acting individual (e.g. MCGREGOR in SCHOLZ 1993, p. 404 ff, MCCLELLAND in SCHOLZ 1993, p. 424 ff).

3 CHANGES IN THE NEED STRUCTURE IN PHITSANULOK IRRIGATION SYSTEM

Farmers in Phitsanulok Irrigation System have widely adapted intensified cropping systems since irrigation was introduced. High yielding variety (HYV) rice, predominately varieties developed in Thailand, is the dominant crop throughout the irrigated area. The plantation of these varieties allows the widely applied labour saving wet broadcasting method of pre-germinated seeds on well puddled, levelled and inundated fields. After three (dry season) to four (wet season) months, the relatively short straw varieties can be harvested by combined harvesters rented from local entrepreneurs including the labour force for driving the combines and bagging the produce. Former village community work in agriculture is reduced to transporting the produce to roads, where it can be picked up by contracted transporters to be sold privately at district markets.

In contrast to the pre-irrigation system time, most of the farmers practice dry season plantation. In flood-prone areas, the dry season crop is the economically more relevant annual activities. Areas seriously affected by wet season losses have shown sharply reduced planting areas for the wet season, where the cropping intensities are as low as 66 % instead of the planned 100 %. Apart of specifically dry years with virtually no dry season plantation, the extend of dry season area has rapidly grown from being under the targeted area in the first five years to being by far exceeded nowadays, with an average of 69 % in the representative seasons during the years 1991 to 1996 instead of the targeted 33 % (RIESER et al. 1999, p.120).

This development is to a high degree related to the spreading of private tube-wells which are used to supplement irrigation system delivery (70 % of the farms) or to serve as the unique irrigation source (about 5 %). Portable pumps are used by 86 % of the farmers, 26 % even have more than one pump in use[4].

The general trend is towards increasingly independent irrigation system farmers: Economically independent because of improved household cash-flows and better access to credit and product markets, agronomically independent by being generally more independent from labour force availability, and by applying supplementary water at the amount and time needed.

In this opening economic system the individual assessment of the benefit in participating is more likely to calculate opportunity costs for the time lost in assemblies and joint working events. Labour force in opening economy is getting scarcer even in periods of low agricultural labour requirements due to increased off-farm income opportunities. Household security might be obtained at lower costs or at a higher level from non-participative activities. In the absence of law enforcement for financial and working participation in WUA[5] it must be suspected that the water user communities have been weakened by the actual situation. The results from farm surveys (HÖYNCK 2002) in the irrigation system areas are somewhat positively surprising, which might be related to the rule that older ”systems tend to be more stable and free of conflict” (FREEMAN 1991, 95).

The activities in irrigated rice farming have developed to be highly mechanised on farm level and on specialised tasks like harvesting by private contractors. In Phitsanulok Irrigation System, the method of hiring private contractors with their machinery is locally extended for executing maintenance tasks. It is much easier to control the individual’s payment of the share for the private contractor than to organise community working events. This kind of co-operation is being rather successfully managed by informal groups in Phitsanulok Irrigation System.

There are tasks in tertiary level O&M which do not require the labour input of all farmers. The individual can thus be motivated to well perform community tasks by receiving payment related to the extra activities. In the opposite direction, the lack of extra payment for extra work leads to reducing or ceasing such activities. Elected chairpersons of WUG in Phitsanulok Irrigation System do generally not perform organisation and representation tasks for honour alone. Embedded in a patron relationship to the Royal Irrigation Department there is a perception among the water users that the chairpersons should be paid by the RID.

---

[4] Statistical data presented here is based on HÖYNCK’s farm surveys in Phitsanulok Irrigation System area in 1996 on the agricultural year 1995/1996 covering about 250 farmers for each specific issue (2002).

[5] The Irrigation Act forms the legal basis of irrigation organisation, defining the calculation of a maintenance fee. Water fees have so far not been implemented in national surface water irrigation systems.

4 ANALYSIS OF THE PARTICIPATION SITUATION IN PHITSANULOK IRRIGATION SYSTEM

It was found that there is a wide range of ways of organising joint activities, differing from the designed organisation type, but functioning to some degree in almost all parts of the system. In the actual situation, farmers participation in WUG as far as existing or in the informal associations at tertiary level is quite satisfactory, since there are no serious problems related to the lack of participation: Conflict level is rather low, agricultural productivity is satisfactory and independent from the rate of participation, the dry season cropping intensity is even higher than targeted at 69 % instead of 33 % (RIESER et al. 1999, p. 120).

As can be seen in Figure 2 and Figure 3, the awareness of membership in a WUG is to a certain degree independent of the farmer's participation in maintenance activities. The recognition of the WUG and the chairperson of the WUG varies very much among different service units and sometimes even within a service unit where all farmers should be members of the same WUG. The distribution of WUG awareness does not correspond to the water adequacy of the conveyance system which is more reliable in the head reach (C 5, C 17/18) than in the tail reach (C 90/91 and C 106). Explanations for the differences found among the areas are related to location specific circumstances, e.g. the strength or weakness of the leader and specifically more or less recent efforts of irrigation agency officers to strengthen WUG.

Figure 3 shows that the actual participation rate is not as bad as might be expected from the membership rate in WUG. The general awareness of the benefit of the irrigation conveyance system seems to be a prevailing motivator to join maintenance activities. These activities are not executed routinely following official WUG regulations but rather according to self-organised activities in case of need for small WUG as prevailing in the tail-reach of the system. In larger service units, irrigation agency field staff regularly address farmers to execute maintenance activities, often supported by village headmen.

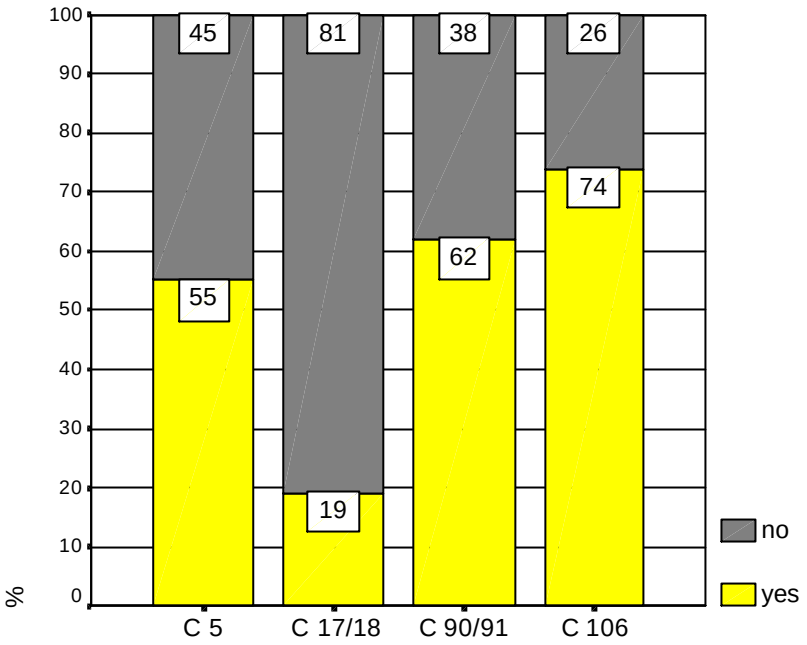

Figure 2: Share of farmers considering themselves to be members of a WUG and who do not consider themselves to be members in samples of selected lateral canal service areas[6]

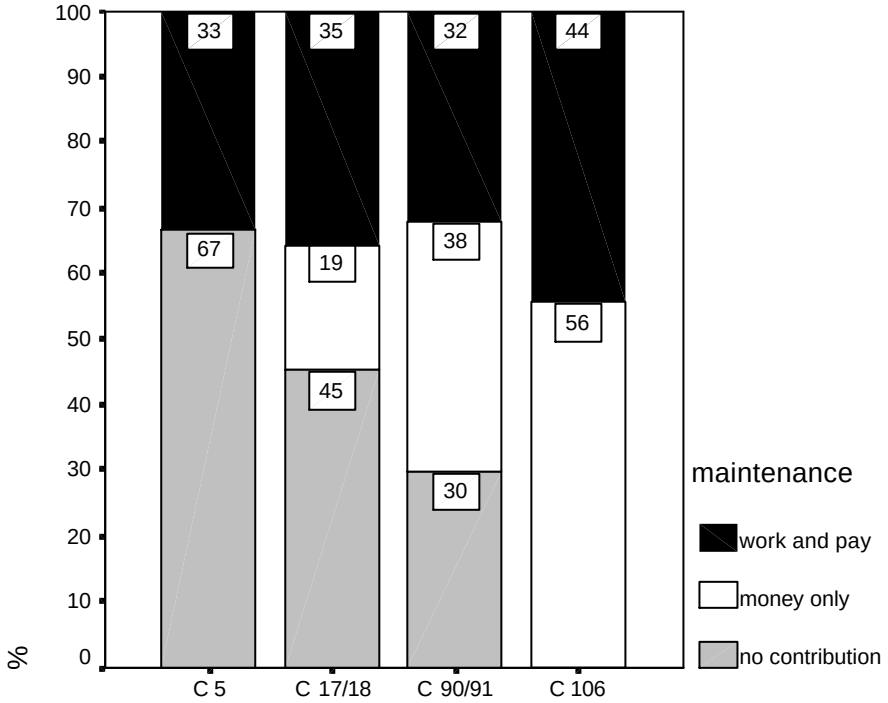

Figure 3: Forms of participation in maintenance of farmers in samples of selected lateral canal service areas[1]

[6] The canals are numbered according to their water flow distance from the head intake structure of the conveyance system, not taking account of the order of the canal. C 5 is a very head-end area of the system, C 106 a very tail-end area. The second figure in C 17/18 and C 90/91 indicate that a lower order canal is branching off the studied lateral, which is included in the sample.

It was revealed that the highest share of non-participants is found in the most head-ward area of the sample, in C 5, although this is the area most strongly relying on irrigation system water. The water situation would be expected to be a very strong motivator for participation in community system activities but it was found that frustration and the lack of control measures are stronger factors for farmers behaviour. Service units are comparative large by number with up to 86 members in one unit. Additionally, water delivery is sufficient for most farmers independent from their participation. Mutual control in the large service unit does not impose group pressure on individual farmers who are rather concerned with their direct neighbours. In a service unit with 86 water users with a branching farm ditch, farmers defined their WUG only for that smaller part of the service unit, a subdivision which is much more sensible than the official one.

Tables 3 and 4 show the relationship of participation in WUG meetings and in maintenance meetings to the farmers perception of water distribution fairness and his/her evaluation of the service unit/WUG quality. An interdependency of perceived "water distribution fairness" with "general satisfaction with the service unit irrigation system" appears to be obvious. Still, for the "participation in WUG meetings" on the other side, there is no such clear picture for the "participation in maintenance activities". Whether farmers consider water distribution as unfair or not does not seem to influence their decision whether to stay away from maintenance or not.

An important interactive negative factor for participation in WUG meetings was characterised as "indifference" summarising the cases of farmers not giving statements, not seeing fairness problems, or not caring about the WUG.

In the actual situation, this indifferent attitude is neutral in terms of conflict potential and thus no immediate problem, but it weakens the water user community because of the lack of interest of that large share of indifferent farmers. Interest representation facing the irrigation agency is by now mainly done by influential individual persons, including political manoeuvres.

The irrigator's communities generally failed when operation issues of co-ordinating planting and water use had to managed. Water shortage from 1992 to 1994 has brought forth a political plan to promote water-saving planting systems for the dry season, especially soybean which was adapted in a very limited area by disappointingly few farmers (reported by the program co-ordinator from the provincial agricultural extension office). The more sensitive water demand of that crop was not successfully handled by the irrigation community, especially when neighbouring plots were planted with rice.

An interesting aspect in this context is the development of conflicts which were reported to be rare and not serious in most of the irrigation system area with a decreasing trend. The increased flexibility of farmers, specifically by pumping water from alternative sources, has diminished the need to openly fight water rights. Instead of open conflicts, a quiet fight is going on which again is strongest in the sampled head reach areas: 70 % of the farmers have suffered interference in their individual water application from other farmers. Only a minority of the farmers declared to have sought for a way to communicate the problem with the interfering farmer.

Table 3: Interdependence of participation frequency in WUG meetings and farmer perception of water distribution fairness and the general satisfaction level with the service unit irrigation system

participation frequency in WUG meetings	evaluation of water distribution			evaluation of WUG and service unit in general		
	fair	unfair	indifferent[7]	positive or to be improved	negative	indifferent[8]
always (N=97)	93%	2%	5%	82%	4%	13%
sometimes (N=41)	83%	0%	17%	61%	10%	29%
never (N=59)	39%	3%	58%	37%	24%	39%
no WUG (N=55)	35%	7%	58%	40%	24%	36%

Table 4: Interdependence of participation frequency in maintenance activities and farmer perception of water distribution fairness and the general satisfaction level with the service unit irrigation system

participation frequency in maintenance	evaluation of water distribution			evaluation of WUG and service unit in general		
	fair	unfair	indifferent[1]	positive or to be improved	negative	indifferent[2]
always (N=83)	54%	14%	31%	66%	2%	31%
mostly (N=61)	66%	7%	28%	69%	5%	26%
rarely (N=37)	62%	14%	24%	76%	3%	22%
never (N=55)	61%	17%	22%	61%	3%	36%

Farmers expectation towards the irrigation agency is the free of charge service of irrigation water delivery through a main conveyance system owned and operated by the irrigation agency. Irrigation officers are respected as the normally benevolently deciding persons concerning water delivery. Irrigation officers can also help in the rather rare cases of open conflicts. The idea of paying for the irrigation service and of maintaining infrastructure beyond the service unit outlet has not yet been an issue in the head sub-system.

In the tail-reach area, where the irrigation agency employs much less staff for O&M per acreage than in the head reach area, some interviewed farmers have reported of having organised the dredging of a lateral canal themselves by collecting the needed amount of money from the farmers of all service units at that lateral canal. For maintenance and in case of need, the farmer communities show a high capacity of organising and executing themselves, even if doing so without having organised as a WUG and without collecting and administrating money as foreseen by the irrigation agency according to legislation.

[7] "no problem" or no statement
[8] "no interest" or no statement

In terms of operation there seems to be a general consensus among the farmers that everybody should help himself as well as possible even if opposing the interest of some unknown faraway member of the large water user community. Pumping from higher order canals and the manipulation of minor control structures is done openly by such a large share of the farmers[9] that a sanctioning of all would be impossible.

This kind of small-scale anarchy limits the motivation effect of the factor for seeking community strength to achieve benefits from two sides: Those "little" anonymous individuals with the opportunity to benefit from the unauthorised water use should not try to wake the sleeping lion of an irrigation authority by appearing in an easy-to-grab community. The disadvantaged farmers suffering from reduced water conveyance through the main channel are frustrated by the lack of the solidarity from the side of the "canal-pumpers". Supported by the opportunity of ground water pumping, tail-end farmers seem to accept their situation as being slightly disadvantage by the fate of having the plot located less advantageous than others.

5 CHALLENGES AND CHANCES FOR THE COMMUNITY OF WATER USERS IN THE FUTURE

5.1 No Problem Forever?

"No problem" is a very common term used in Thai conversation which was also applied for the irrigation and community situation at tertiary level. Although the situation is not at an optimum, water is rarely shared equally, irrigation water delivery does not match the cropping pattern, and maintenance is sometimes lacking behind, there is a general perception that the irrigation system as a whole serves the needs of all farmers.

This "no problem"-peace depends on two factors:

1. Groundwater or alternative water source pumping buffers inadequacies of the water conveyance system and allows independent agronomic decisions. Most of the problem cases were found in areas where groundwater resources were not easily accessible.

2. The irrigation agency serves the farmers free of charge going as far as organising tertiary maintenance activities for the farmers. How should farmers complain about something that is for free?

Easy going non-co-ordinate irrigation activities of the farmers will turn into a serious problem in the most likely case of reduced financial engagement of the state. Like the public sector all over the world, the irrigation sector of Thailand will suffer strong pressure to reduce public costs (CARNEY 1998) and increasing farmers participation in O&M responsibility and some kind of a service fee are inevitable. The above mentioned disadvantaged farmers will not accept their fate anymore if they have to pay for a service not benefiting them, so ways to control the sharing of resources have to be introduced. In the actual situation, neither the irrigation agency nor the water users seem to be too eager to share responsibilities and to be mutually accountable which is very obvious for the irrigation agency staff.

---

[9] It was estimated by RID staff that during peak water demands in the dry season, up to 50 % of the water is abstracted by individual farmers' pumping

5.2 Facing the Main Obstacles for Participation in Phitsanulok Irrigation System

One obstacle to participation was found to be the large number of water users in some service units. Naturally, co-ordination of water application is more complicated and secret interference in other farmers irrigation practices is easier in large service units, too. On the other hand, in large groups it is easier to devise specialised task to single group members which they are paid for and which can be controlled by the others. RID staff should support the farmers in designing a financial compensation system in such groups. Since those systems are further subdivided through division boxes, the WUGs might also be subdivided for maintenance issues which actually is done already based on the initiative of individuals.

Another obstacle for participation is the design of WUG as a group of land owners. The ownership structure in the system has changed since irrigation system construction, nowadays it is much more common to operate on rented farm land (about 40 % of the farm land according to the farm survey of 1996). The land operators should be those who have to pay and have to decide on water issues, even if this means that powerful landlords loose some influence. Switching from a land owner to a land operator definition of WUG membership would put an end to excuses for non-participation or exclusion of tenants, operating heirs and spouses of absentee farmers.

A third obstacle is the absence of interest for the irrigation system or the farmers community of the ”indifferent” farmers (Table 3). The lack of interest in the system can be rooted in a very unsatisfactory water delivery. It should be clearly defined who is entitled to receive water or not. If water delivery to that farm is not possible, it should be removed from the delivery plan. Such a situation of not-receiving exist in the design area but the problem has not been really tackled officially, so the problem of compensation could be avoided. When talking about compensation this means to admit that there exist some kind of property rights for receiving water which quickly leads into the discussion of water pricing. Declaring water to be an economic good is a sensitive issue in Thailand, where water is viewed rather spiritual and non-tradable which unfortunately does not prevent the waste and pollution of that national asset.

5.3 Rethinking the Farmers Role – Participation and Water Pricing

Rethinking the role of farmers, the water right issue must be considered in the future. Since farmers nowadays get water delivered for free they also have no right to claim in case that water delivery is inadequate. A water right and water pricing system would require the irrigation agency to be accountable to the paying water users which consequently would strengthen the farmers interest to have a say in the water allocation, directly on tertiary level and through representatives at the interface to RID.

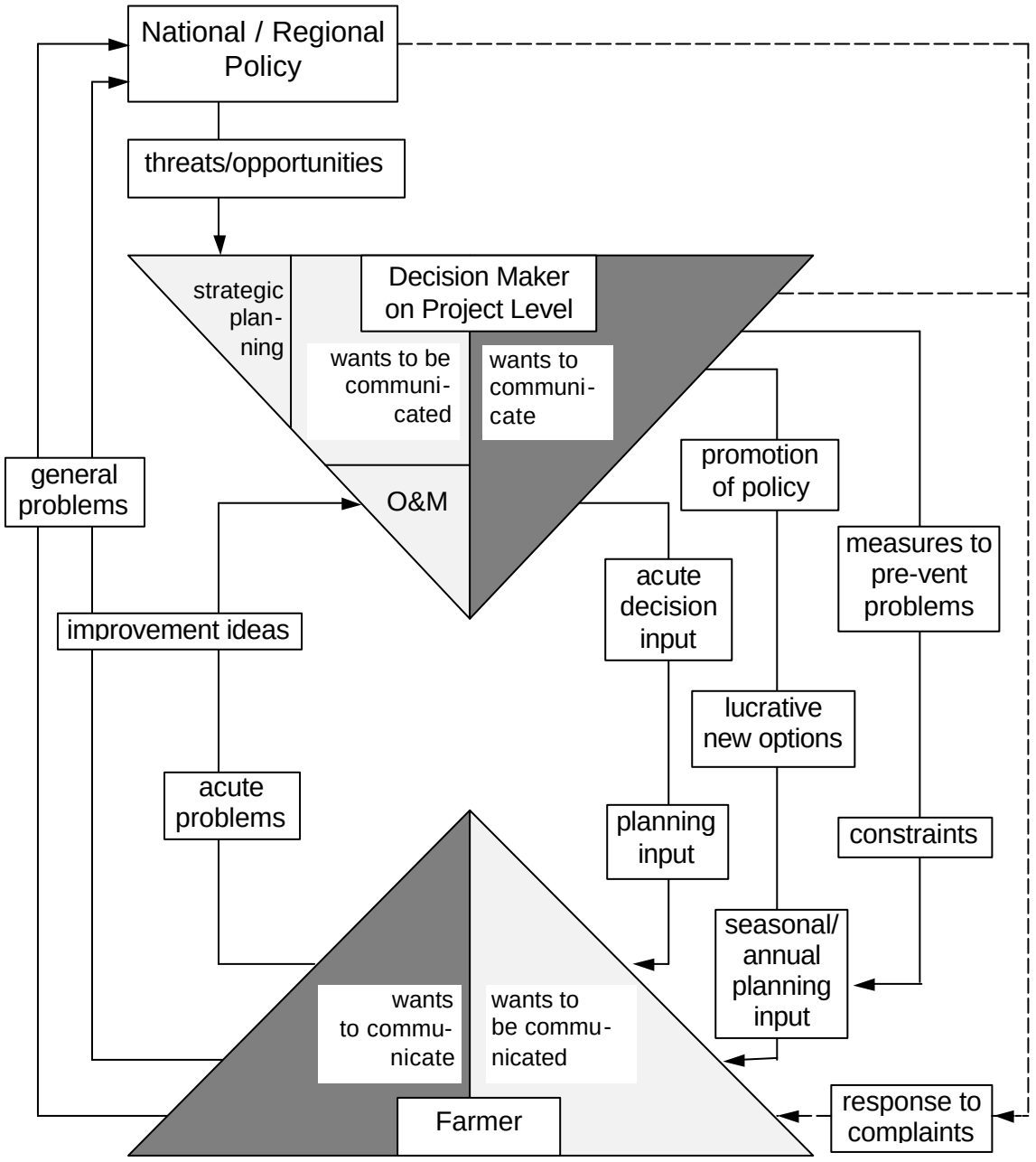

Figure 4: Communication potentials for better integration of farmers

The role of the irrigation agency for strengthening the tertiary level farmer organisation is crucial. Irrigation agency staff is highly esteemed for their expertise, as the authority to which farmers will submit in case of conflicts, and, probably most important, as those who can open or close down the water flows to their fields. In the extraordinary case of close supervision of RID officers farmers even perform as a WUG according to the Land Consolidation Act of 1974. Since farmers are rather controlled than supported in that specific case, this should not be the example which to follow for all the irrigation system are. Considering the high time requirements for these supervision activities this close supervision model is also too costly.

The general perception in RID is that participation is the attendance of farmers in meetings, when farmers are informed about the next season irrigation plans. This is obviously not enough since commonly farmers do not adapt their irrigated agriculture plans to these announcements, basing their personal cropping decisions on ground-water availability, flood risk, or other specific circumstances. The irrigation agency

should not go to tell the farmers what is going to come, this could be also done by sending letters. They should ask representatives of the farmers to find out about the problems, needs and wishes of the farmers before an water allocation committee takes the final allocation decision.

RID can use its good reputation among the farmers to propose an election system, a financial compensation system, and a water use co-ordination system and to support elected leaders with their authority if necessary. Every farmer should be aware that an irrigation agency employee is open to their problems although they should firstly be solved among the water users.

The rather one-sidedly tuned communication channels of the irrigation agency to the farmers, not caring to much whether received by all water users or not, has to be switched to mutual communication (Figure 4).

The lack of motivation for farmers results from the expectation, that farmers will have to pay more although they can not expect a corresponding economic return. They have to specify or modify their role in the community, which opposes their conservative attitude. Instead of a radical cut it is therefore proposed to very soon start to gradually include farmers in the irrigation system responsibilities, in field observations, in controlling water flows, and the maintenance requirements for irrigation and drainage canals. Representatives or the community of farmers should control those activities. The introduction of payments must be done but should carefully be prepared. It must be expected that for some farms the introduction of a fee turns farming into an economically unfeasible issue putting especially the low intensity inefficient farming systems under pressure.

Apart of social considerations it should also be considered in the national equity system that the actual situation supports inefficient natural and financial resource use of water, soil and public expenditure which has to be amended.

The actual participation situation in tertiary level WUA is not a sufficient fundament yet to take over the load of irrigation system O&M to be executed efficiently and fairly and to be sustained from the farmers financial resources. The positive features to built upon are

- the generally well established sense of community creating solidarity if perceived to be necessary and if a social leader takes that responsibility

- the willingness to pay for common services, if they are clearly related to that payment. Raising funds for specific maintenance tasks is the positive example to be extended for other community task in the future.

BIBLIOGRAPHY

CARNEY, D. (1998): Changing public and private roles in agricultural service provision, Overseas Development Institute – Department for International Development, London/UK.

DIEMER, G. & HUIBER, F. P. (editors) (1996): Crops, people and irrigation – Water allocation practices of farmers and engineers, Intermediate Technology Publications, London/UK.

FREEMAN, D. M. (1991): Designing the organizational interface between users and agencies. In: Parlin, B. W. & Lusk, M. W. (editors): Farmer participation in irrigation organization, Studies in water policy and management, No. 17, pp. 35-68, Westview Press, Boulder/USA, San Francisco/USA, Oxford/UK.

HENTZE, J. (1991): Personalwirtschaftslehre 2, 5th edition, Verlag Paul Haupt, Bern/Switzerland, Stuttgart/Germany.

HOEYNCK, S. (2002): Motivation of Farmers in Large-scale Irrigation Systems – Implication for Performance Assessment, Dissertation Draft, Bonn.

HOEYNCK, S. & RIESER, A. (1996): Unterstützung des Bewässerungsmanagements durch Monitoring & Evaluation. In: Entwicklungsländerbezogene Forschung: Standortgerechte Technologien für den ländlichen Raum, pp. 73-82, University for Applied Sciences and Arts - Institute for Technology in the Tropics (ITT) Cologne, Germany.

HOEYNCK, S. & RIESER, A. (1997): Approach to Socio-Economic Performance Assessment in Irrigation Management - A Case Study of Phitsanulok Irrigation System in Thailand. In: Journal of Applied Irrigation Science, Vol. 32, No. 1, pp. 5 - 23, DLG, Frankfurt a.M., April 1997.

LUSK, M. W. (1991): Irrigation Experience Transfer: The Social Dimentsion. In: Studies in Water Policy and Management No. 17: Parlin, B. W. & Lusk, M. W. (eds.): Farmer Participation and Irrigation Organization, pp. 3-33, Westview Press, Boulder/San Francisco, Oxford.

LUSK, M. W & PARLIN, B. W. (1991): Bureaucratic and Farmer Participation in Irrigation Development. In: Studies in Water Policy and Management No. 17: Farmer Participation and Irrigation Organization, pp. 69-96, Westview Press, Boulder/San Francisco, Oxford.

MOLLINGA, P. P. & BOLDING, A. (1996): Signposts of Struggle. In: DIEMER, G. & HUIBERS, F. P. (editors): Crops, people and irrigation – Water allocation practices of farmers and engineers, pp. 11-33, Intermediate Technology Publications, London/UK.

RABIBHADANA, A. (1993): Social Inequity: A Source of Conflict in the Future?, Thai Development Research Institute (TDRI), Bangkok, Thailand.

RDI (THE RESEARCH AND DEVELOPMENT INSTITUTE / KHON KAEN UNIVERSITY) (1995): Factors contributing towards success or failure of tertiary water user groups, RDI Report No. 7, Royal Irrigation Department / The Commission of the European Communities – Northeast Water Management and System Improvement Project (NEWMASIP), Khon Kaen, Thailand.

RIESER, A. et al. (1999): Systems analysis for irrigation performance assessment (SAIPA) – final report (unpublished)

ROYAL IRRIGATION DEPARTMENT - REGIONAL OFFICE 3 (RID RIO 3) (1992): Complete list of water user groups in Phitsanulok and Naresuan irrigation projects as established, Phitsanulok/Thailand (in Thai).

SCHOLZ, C. (1993): Personalmanagement – informationsorientierte und verhaltenstheoretische Grundlagen, (3rd edit.), Vahlens Handbücher für Wirtschafts- und Sozialwissenschaften, Munich, Germany.

SIAMWALLA, AMMAR et al. (1990): The Thai Rural Credit System: Public Subsidies, Private Information, and Segmented Markets. In: The World Bank Economic Review, Vol. 4 No. 3, 271-295, Washington, USA.