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In a state of flux

Water as a deadly and a life-giving force in Southeast Asia

Preamble

In the study of Southeast Asia, there has always been a strong emphasis on everything terrestrial with a concomitant neglect of aquatic aspects.¹ Given the fact that water in its many forms is of critical importance in the region, this is a remarkable oversight. Water, particularly in the form of seawater, heavily influences (and has done so in the past) the fortunes of the region.

As it was exposed to the sea, the area was more accessible to outside political, economic and cultural influences than many landlocked regions. It was a crossroads of many different influences being exercised at the same time. Nevertheless, it could be argued that there is, at least in a cultural sense, 'unity in diversity', and that Southeast Asia is a region with common cultural characteristics that sets it apart from its neighbours. It is clear that India and China have influenced the area for hundreds and even thousands of years, but also that Southeast Asia is evidently culturally quite distinct from these two regions.

What applies to culture does not seem to apply to politics. The area was never an empire in its own right or even belonged in its entirety to any one empire. The area was always politically fragmented, sometimes extremely so. A tiny island could be an independent political unit, and even small islands could comprise a number of 'states', often in constant conflict with each other. On the other hand, the possibility must not be ruled out that neighbouring islands coexisted and traded peacefully for long periods of time, without the benefit of shared statehood. Over the last half century, Southeast Asia has been fairly successful as regards the development of larger states, although lately counter currents are visible in countries such as Indonesia, the Philippines, and Thailand.

Easy access via the sea routes to the area made it quite vulnerable to political control by strong outsiders. So the same easy access that may have been an

¹ I am grateful to Judith van Oosterom, who corrected my English.

advantage in the cultural sphere would be regarded by most as a disadvantage in a political respect.

Easy access through sea routes also stimulated trade from an early age onward. Although the influence of trade on the areas concerned should not be underestimated, it is sometimes amazing to see that it only went 'skin deep'. In Southeast Asia even the inhabitants of areas not too far from the sea could be quite 'thalassophobic' and (at least seemingly) untouched by the winds of trade. It could be argued too that Southeast Asia is also in an economic sense a region with characteristic features that sets it apart from its neighbours.

At the same time, Southeast Asian societies and cultures are confronted with and permeated by 'water from heaven' in the form of rain, flash floods, irrigation water, water in rivers, brooks and swamps, electricity from water-driven power plants, and pumped or piped water, in addition to water as a carrier of sewage. It is in relationship to these types of non-sea water that it can be said that the region has a water crisis on its hands. This crisis has now been around for some time, and it has a profound influence on large groups of people in Southeast Asia.

Finally, we are dealing with the role of water in classification systems, beliefs, myths, healing, and the like: primeval waters, water of life, elixir of life, purifying water, the world ocean with its gods, goddesses, and monsters, water as one of the four or five elements, and water as an element of the body. In this respect water is perhaps more a metaphor than anything else but there are clear links to so-called real water nevertheless.

Seawater, water from heaven, and water-as-a-metaphor all have in common that they can be 'good' or 'bad'. The sea is both a barrier and a link, it brings trade and pirates, and trade itself can bring prosperity or ruin. The sea opens up a region to outside influences, which is usually deemed positive when we think of the exchange of inventions and other ideas, as it may lead to a more versatile people. But, it also renders a region more vulnerable than a land-locked area might have been. People living in such areas, therefore, have to be constantly alive to these two faces of the sea, switching effortlessly from an open, welcoming approach towards it to a defensive one when necessary. Does this mean that 'sea cultures' are more resilient than 'land cultures'?

Water from rivers and lakes, if clean, is a life-giving force. It produces good drinking water, and in the past has enabled the 'Malays' to bathe frequently, something they availed themselves of with enthusiasm. However, pollution of inland waters turns these advantages into evident disadvantages, and it would appear that not all riverine people have made this transition to a policy of water-avoidance. If the people of Southeast Asia are literally able to clean up their act, by stopping pollution at its source and building water treatment plants on a large scale, the presence of river and lake waters will become an advantage again. However, as long as that is not the case a behavioural switch

seems to be called for, unless it must be assumed that resilience in this case means that people just stick it out until things get better.

People living in upland areas, the *montagnards*, are regarded as being typical representatives of a mountain culture. They have the reputation of being a hardy, rugged and fierce people. Those living in the desert, create a sand or a desert culture. Their means of transportation, their clothing, their whole way of life are all geared towards living in the desert. When *they* think of purification, they take a sweat bath.

Can we say, by analogy, that those who are surrounded by water, created a water culture? Or is there a difference in the sense that deserts and mountains are always barriers, always hostile elements, while water can be both, always in flux, oscillating between a life-giving force and a deadly one?

In the following pages, I look in more detail at a number of aspects of water in Southeast Asia, as a prelude to the articles to follow.

The sea

If one links the notion of water to the notion of Southeast Asia, it is probably the sea that comes to mind as the first association. Indonesia and the Philippines are surrounded by the sea, Peninsular Malaysia is almost entirely surrounded by it, while most countries of mainland Southeast Asia have very long stretches of sea coast in proportion to their total surface area, particularly Vietnam.

One of the questions to be discussed in this volume is whether we should conceive of the sea as a unifying rather than a dividing force. Does the sea keep people apart or does it facilitate their getting together? There is a strong tendency to think of islanders as living in 'splendid isolation' (England, Japan). There are certainly many instances of islands where highly characteristic cultures could develop and survive relatively unaltered for long periods of time due to the fact that they were islands (Bali, Nias). In this respect culture mirrors nature, as islands have often a high percentage of endemic species, with the Galapagos Islands as best known example.

The sea is often perceived as dangerous, both on account of the spots of bad weather that have killed many a sailor, and that it was – and still is? – assumed to be home to monsters and evil spirits. Not all islanders are, therefore, sailors.

On the other hand, until the arrival of the modern means of land transport, travel over seas was often quicker than travel over land, which implies that long distances over sea were easier to overcome than long distances over land. It also implies that transport per unit of length was cheaper on sea routes, which, theoretically, and all things being equal, may have been an advantage to commodity-exporting islanders. This may be one of the reasons that small

islands could and did become the nuclei of successful and influential trading states (Ternate, Tidore), a reminder that successful states need not be large landmasses.

In this volume, Heather Sutherland deals in more detail with the opportunities for trade 'created' by the presence of coastal areas at the crossroads of maritime exchange between various Eurasian regions. It could be argued that trade between Southeast Asian polities on the one hand, and China, India, and Europe on the other, has shaped the destinies of many Southeast Asians, in both positive and negative ways. It is a development that dates back at least to the beginning of the first millennium AD, but increases in importance in the fifteenth century, and has continued to grow ever since, albeit with temporary setbacks (Reid 1988, 1993; Brown 1997; Lieberman 2003). With the commodity flows came people, ideas, technology, money, crops, and firearms that, taken together, transformed the region almost beyond recognition. The advantages (and disadvantages) created by trade shaped the lives of many Southeast Asian coastal dwellers throughout the ages. Coastal areas often played a dynamic role in the economic development of the polities in which they were located (for example Tana 2004:3).

But then, of course, a prolonged bout of piracy might cause all these advantages to evaporate, at least for a long time to come. Or was piracy merely a calculated risk, such as living in tiger country, or, for that matter, below sea level?

Cosmology

I briefly mentioned monsters and evil spirits. Powerful beings, represented by named places on the border between land and sea is the theme dealt with by Sandra Pannell in this volume.

Living surrounded by water, people have tried to make sense of the blessings, the dangers and the risks that are connected, or at least thought to be connected to the sea. Thus, they 'populated' the sea with a rich variety of animals, spirits, and other beings. Some of these sea beings are recognized by modern biology (for instance, we now recognize mermaids as dugongs) and it is widely accepted that the seas have not yet yielded all their secrets, not even the bigger ones, such as the supposedly vicious giant squid.

In the past, many societies in Southeast Asia recognized as a power of importance the giant watersnake or *naga*, a name – if perhaps not a motif – borrowed from the Indian sphere of influence.

Another personality is the Goddess of the South Sea, or Ratu Lara Kidul, of the Javanese (Junghuhn 1853-54, I:274; Headley 2004:135-45). It is a multifaceted, complex being, and it is certainly possible that in this Javanese example of a mighty sea deity, features of other beings have come together that else-

where were kept separate. Ratu Lara Kidul is a dangerous deity, living in a palace at the bottom of the ocean, made of the hair and bones of her victims (fishermen, bird's nest collectors). The Goddess is linked to the main temple of the Prambanan complex (Loro Jonggrang, ninth/tenth centuries AD). She was also ritually wedded every year to the Muslim rulers of the Central Javanese state of Mataram and its successor states (seventeenth to nineteenth centuries). Here the state, even when it had officially turned Muslim, apparently felt the need to maintain a visible link with a sea deity. One would like to know whether such a relationship was common to Southeast Asia and other areas with high proportions of coastline.

Sea deities, however, had also much to offer, as they held the key to the riches of the sea. They were supposed to assist those who were in search of these riches, provided they knew how to deal with the goddess (sea deities almost always seem to be female). So can it be said that the female sea deities were, on balance, more benevolent than dangerous?

The Goddess of the South Sea was also held responsible for a number of epidemics, a theme to be dealt with below.

The sea was obviously held to be a dangerous place by many groups in Southeast Asia. Various upland peoples positively avoided the sea – sometimes it was even deemed dangerous to feel the sea breeze. Here, one wonders, whether bad experiences from the past (epidemics, pirates, 'foreigners') may have led to a worldview in which the sea is something to be avoided. One also wonders whether the political leaders of these groups stimulated such feelings, as a means of keeping their subjects from leaving the territory.

At the same time the sea was often perceived as the region where the ancestors came from. There are, at least in Indonesia, many local myths of origin in which part of the population is assumed to be the offspring of immigrants, people who had come from over the sea (and, generally speaking, this was of course true). A general pattern seems to be that a man arriving from overseas would marry a local woman. The descendants of the man's clan would be the political leaders, whereas the clan of the woman would produce the spiritual leaders, with links to the soil (*tuan tanah*, lord of the land). Pre-historical evidence often supports the story of the overseas origins of many peoples in the Indonesian Archipelago. It is remarkable, to say the least, that people who originally came from the sea apparently in some cases have not only withdrawn to the interior of their 'new' island, but in addition have developed a 'thalassophobic' cosmology.

Obviously, we are faced here with quite some variations between societies. At the other end of the spectrum there are the *orang laut* (sea people), who evidently are not afraid of the sea, which also applies to the various trading groups who have made a living from maritime trade, the coastal and pelagic fishermen, the pearl divers, and the pirates. Although they know, of course, of

the threatening aspects of the sea, it is also their means of existence.

However, a society's view on seawater need not determine its perception of all types of water. The Ngaju Dayak (Borneo), for instance, who share the above-mentioned view that many illnesses come from across the seas, are certainly not averse to all kinds of water. On the contrary, water is quite significant in their worldview. In their cosmology, 'the life-giving essence of everything in existence is contained within the Water of Life which is, in turn, stored up in the Tree of Life'. Although, therefore, water is of paramount importance, it is also clear that some forms of water are ambiguous in character. Take for instance the river, the lifeline for many Ngaju Dayak. On the one hand its annual floods are a source of prosperity, as is the fact that it connects upstream with downstream, but on the other hand it causes 'bad deaths' (drowning, death by crocodile) (Jay 1992).

Finally, large water reservoirs (*baray*, *talaga*, and *tirtha*), even though they may have been used for other purposes as well, clearly were also, and perhaps even primarily, religious constructions, a point dealt with in more detail below (Christie 1992; Moore 1992).

Disasters

Some modicum of fear of the sea, whether it is one's main means of existence or not, is probably a good thing. The sea is, indeed, a dangerous place, even though it could be argued that the above-mentioned monsters do not constitute the main threat. Under normal circumstances, that was probably drowning, and it would be interesting to try and find out who could swim and who could not in the areas we are studying.

However, circumstances were often far from normal, and even good swimmers could not do much when the weather was inclement. One assumes that coastal people were used to 'ordinary' storms, and that coastal villages and trading and fishing vessels would be able to survive such an occurrence without too much damage, perhaps partly because going out to sea would be avoided during bad weather. But were people also able to predict sudden weather changes timely enough not to be caught unawares?

In all likelihood, however, most death and destruction at sea and in the coastal areas were caused by the extraordinary weather anomalies conditions to be found in Southeast Asia. I am referring to cyclones, tidal waves (tsunamis), flash floods, tidal bores and other destructive, large water masses, sometimes in combination with storms and/or earthquakes. This is the theme dealt with by Greg Bankoff in this volume.

Flash floods and tidal bores are, of course, not a 'maritime' phenomenon, but as their effects seem to be rather similar to those of the disasters that are, I have included them. One hesitates to include volcanic eruptions, even though

floods often follow in their wake, either because there was a lake in the crater, or because volcanic ejecta were dumped in rivers in large quantities.

The main question, however, seems to be whether Southeast Asia was and is often hit by such water-related disasters. It seems rather obvious that this was more often the case than in land-locked areas. In how far did the frequent occurrence of these disasters shape the worldview of the coastal people? Has it made all but the hardiest averse to maritime activities, or is such a natural disaster just one cause of death and destruction amongst so many others? Did it contribute to an – alleged – inclination towards fatalism and gambling? Did it keep people from building houses of stone or brick instead of bamboo or wood?

We also would like to know how those in authority reacted. Was the tribal lineage head, the chief, or the ruler of a larger polity held responsible for such disasters? Did they attempt to support those who had been hit by one? Did this change with colonial and post-colonial states?

There are those who argue that due to global warming (the greenhouse effect) the incidence of ‘extreme weather events’ is increasing. If that be the case, what does that entail for Southeast Asia?

Piracy

Seas, so it seems, could be rendered quite unsafe by natural phenomena. Moreover, in addition to monsters and cyclones, man-made threats were not rare either. The phenomenon that in this respect has most captured the imagination is no doubt piracy, a theme dealt with in this volume by James Warren. Pirates figure in all ages and all places, but, at least in the eyes of historians, they appear to be associated particularly strongly with the Caribbean and Southeast Asia. In the latter region, piracy, by many probably regarded as a quaint relic of the past, has lately returned with a vengeance.

Ever since the late nineteenth century scholars have assumed that piracy in Southeast Asia was a response to colonialism and Western enterprise (Rutter 1986:26-8). This was no doubt partly true but when the first Portuguese arrived in Southeast Asia, the pirates were already there. It is even suggested (Tomé Pires) that some states, particularly in Sumatra, were in effect sea-robber states (Cortese 1944). This makes it difficult to link piracy exclusively to the absence of strong states, because, apparently, sometimes the pirates were the state (compare also Warren 1981).

This does not mean, of course, that there was no relationship at all between the strength of the state and the incidence of piracy. A state with strong mercantile interests, whether local or colonial, would probably try to curb pirate activities (unless, perhaps, it was cheaper to learn to live with them). Piracy could also be the result of internal strife in a state, for instance if a cadet branch

of the ruler's family felt that they were not receiving an income commensurate to their status. As there were always many pretenders to the throne in South-east Asian polities, disgruntled contenders were an endemic feature.

Piracy also seems to come in cycles. It can be absent for many decades in a row, but it also surfaces just as suddenly as it disappears. One is tempted to look for a relationship between bouts of piracy and economic booms, as it stands to reason that pirates will become active in a general climate of growing commodity flows. Or do they take to the sea in desperation, in times when normal trade comes to a standstill?

However, it also seems that piracy was never entirely absent from South-east Asia, at least during the Early Modern Period, perhaps partly because piracy was linked to another phenomenon that played quite some role in the social and economic history of the region, namely slavery. The demand for slaves was always high, both in the indigenous and in the foreign sectors of the economy, and slave raids were, therefore, always profitable, and could be easily combined with some general plunder as a sideline (Junker 1999; Boomgaard 2003).

Nowadays piracy is, needless to say, no longer linked to the slave trade. So what makes it tick? Is it 'politically correct' to call it just a criminal activity as any other form of theft? It seems to me that the 'old' piracy was surrounded by a romantic anti-colonial aura, and that it was (and is?) not politically correct to regard it as just a criminal activity, but more as something akin to peasant unrest, social banditry, and the Luddites.

Exploitation of aquatic resources

The sea is, of course, not only a wrathful goddess; it is also a bounteous provider (for Indonesia see Tomascik et al. 1997). In a region with such a high ratio of coastline per unit of surface area, fishing must be – and must have been – an important activity, a theme dealt with in this volume by Manon Osseweijer. It provides a fair number of people – boat owners, traders – with an above-average income (compared to the ordinary peasant-cultivator), and in the past it also may have stimulated monetization. At the same time it provides densely populated areas where meat is a luxury with a cheap source of protein. Theoretically, a high proportion of fishing could have kept numbers of livestock low, as an abundant supply of cheap fish should make animal husbandry less attractive. All this applies to both fresh water (Masae and McGregor 1998) and pelagic fisheries. As a considerable proportion of this fish was dried and salted, it must have stimulated salt production, in many areas of Southeast Asia another coastal activity (Backhaus 1998).

But fish is, of course, not the only kind of food that comes from seas and rivers. Shellfish, crustaceans (shrimp, crab, lobster), turtles, and – mostly

for export to China – sea cucumbers are also caught in large quantities, as is seaweed. Here we seem to see a gender division of labour, as those who go fishing are almost always men, while those who go out to collect shrimps, etcetera, are mostly women. One would like to know whether the production (in large quantities) of non-fish food from seas and rivers is a relatively new phenomenon, perhaps related to depleted stocks of fish. Old shell-middens suggest otherwise, and it might just be a lack of data that make the collection of non-fish food in the colonial period difficult to trace.

One also expects to see a coming and going of different species of fish at the markets, as one species after another becomes depleted. Is this a relatively recent phenomenon in Southeast Asia? There are some indications of this already in colonial times (Butcher 2004).

Some of the animals captured from the sea are partly eaten, but other parts are sold as non-food commodities. Turtles are an example. Another example is the whale, which is still being hunted by small-scale local fishermen (Barnes 1996), while they used to be hunted by Americans on much larger ships (*Moby Dick*!). Pearls are another highly coveted item, as are rare shells (for tourists and collectors). In former times some shells were used as medium of exchange (for example cowries), and were therefore collected in large quantities. The sea, therefore, for a long time has been exploited by many peoples in many ways, but our knowledge of all this, at least as regards the past, seems to be rather limited (but see Butcher 2004 and Boomgaard 2005). One would like to know, among other things, whether shifts could be observed in the shares of fish, non-fish food and non-food over time.

The question of how large-scale exploitation of aquatic resources developed in addition to small-scale enterprise seems to be highly relevant, including the question about restrictions imposed – by local, regional, and/or national authorities – on big enterprise, if any. Is the state imposing limits on catches, and if so, since when? Are these attempts successful? How seriously are maritime resources being overexploited (compare also Covich 1993; for Indonesia see Dutton 2005)?

One also would like to know to what extent (state sponsored?) aquaculture has taken the place of collecting wild aquatic resources, and whether the former activity is more sustainable than the latter.

Finally, polluted water (see below) from the big rivers seems to be threatening both fisheries and aquaculture (Lucas 2000:75-7). It is difficult to imagine that this problem could be solved without state intervention. So it might seem that, for various reasons, the state would have to intervene more often, and be stricter about implementation of and adherence to its regulations.

Water rights

Given the importance of the sea (and other waters) as a provider of food and tradable non-food commodities alike, one expects that people stake out claims as the rightful users of these areas. It could be argued that the more resource-rich the sea, the more strategically important it will be, and the more likely that, when population increases, it becomes the object of competition between a variety of people, groups, and organizations. The sea was (and is) both battlefield and prize, so to speak. In this volume, Franz von Benda-Beckmann deals with rights over various kinds of water, and with the conflicts generated by these scarce resources.

Control over the sea, as a source of wealth and a means of transport, has been the object of conflict and of legal regulation. Regulations cover both legitimate control over sea space and rights to access and exploitation of sea resources. While shallow coastal waters often fall under the legal-political control of the adjacent land-based political organizations, more distant waters are less easily laid claim to and even less easily controlled by the latter. Historically, there is a tendency of ever increasing 'enclosure' of the sea, as states are continually extending the boundaries of their maritime territories or zones of economic influence. As the 'global commons' become increasingly enclosed, conflict over them is intensified.

With the arrival of colonial states and, later, national states, and with the increasing influence of international organizations and treaties (UN law of the sea, 1982), earlier rights of 'tribes', villages, and small and large kingdoms were (partly?) superseded by claims of a higher level, at least in theory. In practice 'higher' claims were and are not always recognized by those who held the earlier claim, and a rich source of conflict was thus created.

As is shown in Von Benda-Beckmann's contribution, growing population densities and the overlapping of various legal systems have also led to increased conflict over fresh water resources, owing to growing competition over inland water sources. As population growth continues, and as the frequency and intensity of droughts might increase due to global warming (still a hypothetical possibility), the frequency of such conflicts is not likely to diminish.

Water in health and illness

The 'Malay', who came in boats to the areas where they live at present, have existed as typical 'water people' for a long time. They often lived along rivers, and some people have argued that their houses on stilts and their custom to drop all refuse through a hole in the floor dates from the time that they all lived thus. It could be said that this way of getting rid of household waste (in

Malaysia and Sumatra) was a health hazard, although the animals penned beneath the house (particularly pigs and dogs) often functioned as a kind of 'sanitation police' service, while during the rainy season everything just washed away.

Most European visitors in the past also remarked on the fact that the Malay people bathed at least once a day in the river. As water, at least among the Muslims, was often also their main beverage and the river normally the sole source of water, there was (and still is) a potential conflict between drinking and bathing in one and the same. Moreover, the river was also the place where sick and feverish people sought to cool of, where people relieved themselves, where clothes were washed, and where the cleaning of household utensils took place.

It may be assumed that such potential conflicts did hardly play a role in sparsely populated areas, but larger population concentrations must have been faced by problems at an early stage. The first Dutchmen to visit the then influential port-of-trade Banten (western Java) around 1600, commented upon the dirty water of the river running through the city. As time went on, and numbers increased, almost all rivers turned into health hazards.

All this applies under normal circumstances, but problems increase in magnitude as soon as water becomes more polluted than usual. This could occur during an epidemic of a waterborne disease such as cholera. It could also happen during the rainy season when the river was full of natural debris, and during the dry season when the concentration of pollutants went up. Nowadays, the rivers of the region are faced with year-round industrial pollution.

Thus, until the introduction of piped water and a separate sewage system, a 'water people' with a keen sense of cleanliness ran into serious trouble when the self-cleaning capacity of rivers could no longer cope with ever increasing levels of pollution.

Another problem where state intervention is inevitable is that of the competition for water between various claimants, particularly during dry spells, when there is a water shortage anyway. Drought induced water shortages always have been notable health hazards. With the growth of the population it is to be expected that this problem will become more acute as well.

Particularly during prolonged droughts – such as in the summer of 2003 – the problem of water shortages becomes acute in places such as Jakarta. Water tables have dropped, a phenomenon often exacerbated by uncontrolled logging and other acts of environmental destruction. As the water in reservoirs gets close to critical levels, electricity supplies are threatened, because water for the hydropower plants is lacking, as is that for tap water and irrigation.

At the same time flooding is increasing in Jakarta, as the soil has been compacted by construction activities and the removal of water by a large number of wells, as witness the large *banjir* in February 2002, particularly in the lower lying, that is poorer areas of the city.

Water in indigenous medical theory

Given the fact that water is a potential health hazard nowadays, and has been one for a long time in many areas of Southeast Asia, the notion, held by many indigenous people, of water as a healing force might make matters even worse. This notion applies, of course, particularly to 'sacred' water, water that has been blessed. In Java, the 'sacred pool' (*tirtha*) and the 'tank' (*talaga*) are very ancient 'institutions' indeed. Many Javanese inscriptions mention in addition 'the water of life' or 'the elixir of life' (*amrta*) (Christie 1992).

In the many rituals that marked – and sometimes still mark – the daily lives of many people in Southeast Asia, water is often an important feature. This seems to be the case with both coastal and – at least some – inland groups.

Among many Indonesians there is a – related? – theory that, while wind is unhealthy (*masuk angin*), water is healthy (although, strangely enough, rain is often perceived as 'bad'). In many instances, bathing a patient in water was the only 'remedy' indigenous healers would apply, as in the case of small-pox, besides incantations and offerings, of course. It seems likely that water is regarded as healthy because it is 'cold' and can, therefore, be used to cure people who are diseased and as a result 'hot'. The binary opposition hot-cold is one of the basic elements in Malay medical thought.

As we have seen, many Southeast Asian areas have long coastlines and have the sea as their neighbour. Other, more inland areas, particularly in Mainland Southeast Asia, have large rivers as their lifelines. Moreover, many of these areas are characterized by very high levels of precipitation. In other words, it is probably difficult to find regions 'wetter' than (tropical) Southeast Asia, at least of a similar size. Could it be argued that this is reflected by the importance of water in indigenous medicine?

Waterborne diseases

On the other hand, as we have seen above, many Southeast Asian island people dreaded that large body of water, the sea, and those who came from the sea, as most epidemics seemed to come from there. So there is often an association of epidemics such as cholera with some sort of Goddess of the Sea. When in Java the Goddess of the South Sea and her servants were heard riding through the air, cholera was on its way. This notion, by the way, that epidemics came from overseas, is often based on actual fact, at least on islands that are not too densely populated. Here, diseases such as cholera and smallpox would die out eventually and only with a fresh infection from outside could the disease spread again.

It was often not the sea itself that carried these diseases to the shores of Southeast Asia – although, as recent research shows, in the case of cholera it

was – but rather the people who came from overseas. Rivers, however, did (and do) indeed carry the causative organisms of many diseases, particularly gastro-enteritic strains.

Finally, (stagnant) water should be mentioned as breeding ground for malaria-carrying *Anopheles* mosquitoes. In this case pollution might be a blessing in disguise, as it appears that the larvae of *Anopheles* do not survive as well in dirty as in clean water.

In late-colonial times, the medical establishment was rather confident that malaria could be eradicated, but it seems safe to say that that is no longer the case. Now that the use of DDT has been forbidden – and rightly so – species sanitation seems to have lost some of its lustre. At the same time, some forms of malaria seem to have developed immunity against the drugs employed to kill them. Altogether it forms a rather bleak prospect. Is there better news regarding the gastro-enteritic diseases? And how reliable is the registration of these diseases, if one takes into account that there are sometimes clear disincentives for bureaucrats to call a disease such as cholera by its proper name? Although it is now easier to keep young children from dying from cholera than in the old days, cholera is still far from having been tamed, and in the early 1990s an upsurge was reported worldwide (Gleick 1993:4).

We are also interested in the question of state initiatives regarding water-related health issues, in addition to medical advances and setbacks. In historical perspective, one would like to know whether water was ever regarded as a health hazard by pre-colonial indigenous states. One would also like to know when colonial states started to perceive the multi-purpose use of water as problematic, and when they started to do something about it. From a present-day perspective we would be interested in the priorities formulated by the state in this respect, as much as the action really undertaken. In this volume, Foong Kin deals with a number of water-borne and water-related diseases in historical perspective.

Pollution, sewage, drinking water

Water pollution was not a major problem in Southeast Asia prior to the 1970s, although of course locally the waste products of the big cities did cause very dirty water prior to that date (Yeoh 1993). However, it seems fair to argue that real pollution came with large-scale industrialization. Many of the big rivers in the area became so polluted from then on that they came to constitute a major health hazard to the downstream areas. It is an issue taken up in this volume by Anton Lucas and Arief Djati.

Nowadays, available and affordable technological possibilities largely determine quantity and quality of the water supply for the majority (?) of the urban end-users. Technological factors also determine the modalities of the disposal of water-borne waste in the urban areas.

As we are talking about available and affordable technology, it could be argued that the real determining factor is the availability of capital (Nash 1993). Or even the willingness of the state (central, provincial or local) to take upon itself the construction (and maintenance) of a good system of piped water, an equally good sewage system, and high quality water treatment plants. This, in turn, might be related to the ability of the state to increase taxes, as it is unlikely, at least in the short run, that such systems are self-financing. Or is it too dogmatic a thought that only the state can take care of these things? In many countries water companies are being privatized because the state does not appear to be able to turn the production of tap water for the masses into an economically viable venture. The issue of privatization of the urban water supply (in Jakarta) is dealt with in this volume by Okke Braadbaart. As the provision of clean drinking water for the poor was not guaranteed when the water companies were run by the state, it becomes increasingly unlikely that such guarantees will be forthcoming in the near future, under private ownership.

This does not mean that the state is perceived as an efficient provider of clean water. At least in Indonesia, polluted water has become a hotly debated issue, and even during the repressive New Order regime of Soeharto, protests about polluted water erupted from time to time (Lucas 2000).

Be that as it may, technological change over the last century has been at the heart of adaptations of water supply and liquid waste disposal to increased population concentrations.

Modern sewage systems may be healthy in many respects, but they pollute the sea, unless water treatment plants have been installed. They also remove substances that could have been – and in the past have been – used as manure. Instead, farmers now have to buy and apply large quantities of artificial fertilizer. In addition to higher costs, this loss might also be detrimental to the structure of the soil. The loss of nutrients, however, might possibly be stopped if advanced methods of water treatment were applied.

For the moment, the low quality of drinking water for the many to whom piped water or water from uncontaminated sources is not available, does not yet show up in the overall mortality figures. A more detailed breakdown of these figures might give a different outcome. After all, what is bad for marine life can hardly be healthy for humans.

Climatic variation and agriculture

One of the most important prerequisites for good health is, of course, the availability of sufficient food of a good quality. Most food in Southeast Asia is locally produced. Of these foodstuffs, fish and other edible maritime and river products have been mentioned above. The two large categories hitherto not dealt with are agricultural crops and livestock. It goes without saying

that water is of utmost importance for a good harvest and for successful live-stock raising.

Monsoon Asia, to which most of Southeast Asia pertains, is characterized by a variety of agro-climatological regions. Most of these regions have a typical rainfall distribution with a wet and a dry season, the length of which varies from region to region. These climatological characteristics have implications for agriculture and animal husbandry.

A question one would like to have answered is whether rainfall patterns determine cropping and stock rearing patterns as well and therefore also the flow of tradable surpluses – and so of money and credit. Are patterns of land-use and land holding (partly) determined by the same precipitation patterns?

And what do we get if we compare Monsoon Asia with Tropical Rainforest Asia? If rainfall patterns do, indeed, to a large extent determine patterns of agricultural production, one wonders whether the same is true regarding population densities and state formation. One also would like to find out whether the existence of these zones has ever been a reason for state expansion. Here I am thinking of conscious attempts by states to include different climatic zones within its boundaries, as a form of insurance against total crop failure and famine. Perhaps it may be seen as a variation on the lowland-upland theme that has featured prominently in the history of many Southeast Asian polities.

I hasten to add that rainfall patterns are not a given that keeps for instance cropping patterns in an eternal iron grip. Humans have manipulated the flow of water for thousands of years, a phenomenon that is usually indicated with the term irrigation, a topic to which we turn presently.

Water in irrigation and drainage

Water control is a key feature of Southeast Asian civilizations. It has shaped the Southeast Asian landscape, and irrigation systems are visible records of labour, history and power relations. Irrigation and drainage systems, in turn, have shaped social relations, cropping patterns, and cultural, economic and political behaviour (Lansing 1991; Mosse 2003).

Uneven and variable rainfall makes it imperative for the farming population to regulate the flow of water. In low rainfall areas the problem is, of course, that water shortages are to be expected. It is therefore attempted to store water in times of relative abundant precipitation. This can then be used for irrigation in both the wet and the dry season. However, in regions with high rainfall (1,800 mm/year and over) there is, in addition to periods of shortages, also a problem of periodic water surpluses. In such regions drainage is as important as irrigation.

Strangely enough, most sites established in Southeast Asia between 1000 BC and 1000 AD were located in low rainfall areas, where some sort of irrigation was a necessity (Stargardt 1992).

Pre-European irrigation

In Southeast Asia, irrigation is an old feature of wet-rice agriculture. Aspects of socio-political organization are thought to be connected with the need to construct and maintain irrigation and drainage systems. These connections have drawn scholarly interest since the publication of Karl Wittfogel's studies on the features of hydraulic societies (Wittfogel 1957). This analysis has led to a long debate among social scientists. In this volume, the contributions of Jan Wisseman Christie and Willem Wolters take part in this debate.

It now seems that the value of Wittfogel's ideas in this respect, namely that the need for large-scale irrigation works ('hydraulic agriculture' in Wittfogel's term) created the 'oriental despotic' state, is rather limited as regards Southeast Asia. This is not really criticism that should be levelled at Wittfogel, as he was talking mainly about arid areas. In a collection of essays, published a few years ago (Rigg 1992), it was argued that most medieval systems were small-scale ('hydroagriculture') and that rulers were seldom involved with these irrigation systems. Moreover, the large-scale (and state sponsored?) systems that could be encountered in some regions had primarily religious functions, not agricultural ones.

However, we should avoid throwing out the baby with the bath water, and perhaps it is time to rethink some of the arguments raised in Rigg's volume. For instance, the argument that the large tanks of mainland Southeast Asia may have had primarily a religious function, smacks a bit of an overly rigid, perhaps typically Western attempt to impose as separate categories what may have been perceived as not more than simply aspects. If water is perceived as representing fertility, is it really useful to try and distinguish between primarily a religious function and secondarily an agricultural one?

Neither should it be assumed that the state played no role at all (Aung-Thwin 1990), or that all state-sponsored water works had religious functions only. Recently the old discussion concerning the large artificial lakes (*baray*) of Angkor has been revived, and it is once more deemed possible that they had at least partly an irrigation function (Pottier 2000; Lieberman 2003:228-9).

Another interesting question is why so much energy was invested in irrigation. Most scholars would probably agree that around 800 AD, population pressure cannot have been the reason that people constructed irrigation works and started to cultivate wet rice. Material from Java suggests that the state provided tax incentives (Christie 1992), so one would assume that they had an interest in making people grow wet rice. Is that because a wet rice cultivating population

is a sedentary population? Is it because it is easier to tax them (but weren't they exempted?), to call them up for corvée duties, and to make them serve in the army when the ruler goes to war? Was it because wet rice has a better chance to yield a good harvest than dry rice? Was it an attempt to create safe zones (against robbers/raiders?). Would rulers in those days have known that wet rice planters have higher population growth rates than shifting cultivators?

The tax incentives suggest that without the stimulating role of the state people may not have taken upon themselves the burden of constructing water works and the bother of wet rice cultivation. Is this Wittfogel having been ejected by the front door, making his comeback through the back door?

Finally, one would like to see more research on 'natural' irrigation systems, such as the 'flood-water retreat agriculture' in the past in Cambodia (Stott 1992), Kalimantan (Borneo), and Sulawesi (Celebes).

Colonial irrigation

Manipulating water flows is something the Dutch have been doing for centuries. When they came to Java around 1600, they soon started digging canals there as well, albeit on a modest scale, particularly around Batavia (Jakarta). In early nineteenth-century Java, Dutch civil servants ('Residents') were expected to supervise the wet-rice related irrigation systems, and occasionally they were also involved in the construction of dams and the digging of canals. One could argue, however, that in these instances the Residents were applying local, Javanese technology, not Western knowledge (the occasional European surveyor apart).

Only after circa 1850 the construction of large-scale irrigation systems was undertaken by the colonial state. These were usually public, large-scale gravity flow systems serving both peasant smallholders and plantations. The construction of these systems was in the hands of Western engineers, applying technical knowledge from the engineering schools that were gaining in number across Europe and the USA during the nineteenth century.

It would be interesting to put the perceptions and the performance of these engineers in a comparative perspective, including the strength of the engineers lobbies in the various mother countries. How well did the engineers really do? So-called counterfactual history is no longer as popular as it was some 30 years ago, but in this case one would gladly revive it with the question what would have happened if the engineers had not intervened. Could a growing population have been fed solely on the basis of more small-scale irrigation schemes? Or would population growth have been lower?

One is also tempted to argue that the construction of these large-scale systems forced the cultivators to grow rice, at least in the wet season. We can only speculate what their own preference would have been. It has been argued that

Wittfogel's 'Hydraulic State', purportedly called into being in the Pre-Modern Period, did really develop in Southeast Asia after 1850, with the large-scale irrigation works laid out by the colonial states (Boomgaard 1993:211).

Communities of end-users

Robert Hunt presents in this volume a comparative perspective for communal irrigation systems. Probably the oldest types of irrigation are small-scale community systems, constructed by the local population. These works often have been considered as inadequate and too small, but these are in many instances sustainable, sometimes age-old and still functioning systems. Examples are the *subak* of Bali and the *zanjera* in the Ilocos region in the Philippines. A remarkable feature of these systems is the local social organization, which orchestrated their maintenance and the successful long-term interaction between community and physical infrastructure (Christie 1992 and Stargardt 1992; see also Wolters, this volume).

However, the large-scale irrigation systems constructed by the colonial states did not have the benefit of the smaller systems with their organization neatly tailored to local needs. While the dam and weir and the primary and secondary canals would be administered and maintained by the central irrigation bureaucracy or their provincial representatives, the management and upkeep of the tertiary canals and the distribution of the water over the fields of the end-users was less easily organized. Should this be entirely in the hands of the local community? Or should the central (provincial) bureaucracy have a larger say in these local affairs?

National irrigation bureaucracies, both during the colonial period and after independence, have often been stymied by this end-user problem. In many cases they have attempted to create what we now call Water User Associations, with the above-mentioned local organization – Hunt calls them Irrigation Communities – in mind, only to discover that this did not work. In some cases (Philippines, Mexico), however, these attempts were more successful (Hunt 1989). So what seems to be the secret of turning a Water User Association into an Irrigation Community? And what are the prospects of doing this in Southeast Asia outside the Philippines?

However, Water Users Associations, it seems, run the risk of being perceived as panaceas by scholars and policy-makers alike. Above all, they are supposed to improve the efficiency of the irrigation systems, and one sincerely hopes that to be true. It is also expected that they will do better at making cultivators pay (more) for the privilege of using irrigation water than does the irrigation bureaucracy (Postel 1993). One assumes that paying a 'realistic' price for irrigation water would help in the struggle among the many contestants for water, but one hesitates to call this a realistic expectation.

Anti-dam struggles

Another interesting aspect of the large-scale irrigation systems is that they have been popular for such a long period. As we have seen earlier, the first ones date from around the middle of the nineteenth century. Around 1900, large projects were under way in the Indonesian Archipelago and elsewhere in Southeast Asia. Now, a century later, large dams and irrigation systems are still on the agenda of a number of Asian countries, and also on that of the World Bank.

It seems, however, that this popularity is being slowly but surely eroded as the scale of the projects increases, particularly, as far as Asia is concerned, in India (Narmada dam) and China (Three Gorges dam). Another factor is that environmental concerns are being voiced louder than before, by NGOs among others. At the same time there is less inclination to accept the social costs that will have to be borne by those who live in the areas to be inundated when a large dam is constructed. There are several examples of such anti-dam protests in mainland Southeast Asia (Hirsch 1998) and in Indonesia (Aditjondro 1998).

Although, as we have seen, the role of the Southeast Asian state in the construction of irrigation works was probably not all that important prior to, say, 1500 AD, the large-scale irrigation works dating from the period 1850-2000 could not have been carried out without intensive state intervention. Now, it appears that the state in Southeast Asia has reached the limits of its involvement with large-scale irrigation, at least in the eyes of many of its citizens. According to the literature on this topic, there are many different factors involved in the coming of age of the anti-dam protest movements, and it would be interesting to discuss these factors in more detail.

After all, if these movements are successful, the epoch of the 'hydraulic state' in its modern guise might be drawing to a close, though I may be exaggerating slightly. There are signs that some states are now avoiding these large-scale projects, as they are eager to avoid the hassle of the recent protest movements (Mitchell 1998:84).

Epilogue

The possible end of the large-scale irrigation projects is an apt metaphor to end this introduction. Water, in all its aspects, may be a given in Southeast Asian society, its role at any given moment of time is clearly politically, economically, socially and culturally constructed. Seen in this light, the meaning of a notion such as 'water culture' (as opposed to a desert culture or a mountain culture) will evidently fluctuate with the times, stressing the advantages at one moment, and the darker side of water at another. It will have to be rethought for every epoch and for every aspect to be studied.

In many respects the role of water in Southeast Asia has changed over the years, and it will no doubt change in the years to come. For instance, it could be argued that water used to be a free gift of nature, an open access resource, such as air. In most Southeast Asian areas that is no longer the case, and it may be expected that conflicts over water (rights) will increase in number. Thus, a different 'water culture' is or has been emerging.

However, it is also clear that geography, climate, and other water-related natural features have played a powerful role in shaping Southeast Asian histories, cultures, societies and economies. This volume presents a number of possible approaches that attempt to study Southeast Asia with water as the central idea.

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