

CHAPTER I

Improving River Transport for Poor Communities

By Richard Leete & Nabilla Sharil

Building roads take time. In the meantime, Sarawak's rivers will have to serve as the super-highways for many.

River commuters travelling at daybreak near Song, a small trading town on the Rajang, Malaysia's longest river. As a safety precaution, river travel is only permitted between sunrise and sunset.



In Peninsula Malaysia, river transportation has long given way to road and rail links. In Sarawak, rivers are not only essential for trade, which ultimately goes through its seaports of Kuching and Sibuloc located in the south, as well as Bintulu and Miri along the north coast, but also for communities and, especially the poor, to access schools, clinics and markets.

The state's road network is still underdeveloped and, unlike in Sabah and the Peninsula, there are no railway networks to connect the different parts of the vast state. Under the Ninth Malaysia Plan 2006–2010, RM702 million has been allocated to Sarawak to upgrade rural and village roads to increase accessibility and connectivity between rural and urban areas. But building roads to better connect people will take time. In the meantime, the state's rivers will have to serve as the superhighways for many.

Sarawak has an enviable record of development since joining the Federation of Malaysia in 1963. Yet, Sarawak's overall poverty rate was recorded at 7.5% in 2004. The level is much higher among the rural population, who comprise slightly over half of the state's total population. Many poor rural communities, settled along the rivers rely on the rivers for access to basic services and for their livelihoods.

Effective transport is crucial for connecting the rural communities to Sarawak's larger cities and towns, for decreasing isolation and for providing employment opportunities. Of course, human needs are not just physical. Effective modes of transport can also help to increase social capital.

Pollution of Sarawak's Rivers

As elsewhere in Malaysia, the water quality of Sarawak's rivers is deteriorating. With development, river pollution has increased and water quality has declined. All of our lives depend on our rivers. Polluted rivers affect the health of plants, animals and humans.

River pollution is caused by discharges of sewage, nutrients, waste water, chemical waste and oil, plastics and debris, thermal pollution, riverbank erosion and sedimentation. We can contain the problems and preserve and enjoy the beauty of our rivers.

Promoting community-based eco-tourism along rivers can help increase awareness of sustainable river management. It can also help generate income for poor communities. A community-based eco-tourism project at Krokong, Bau, under the EC-UNDP Small Grants Programme for Operations to Promote Tropical Forests, does just that, and supports fishery management as a conservation strategy.

Community Water Transportation

In designing and implementing an effective mode of Community Water Transport (CWT), it is necessary to take into account issues of access, size, cost of operation and river maintenance. Access to the CWT must consider the individual needs of men and women, both young and old.

Cost for commodities, such as diesel fuel and petrol, fares and tolls, should be taken into consideration as fluctuating prices can have an immediate impact both on service providers and customers, especially those of low income.

Longboat tourism in Batang Ai, Sri Aman.





Many of the nomadic tribes, including these Penan children, have been resettled by the Government.

CWT can be environmentally friendly, energy efficient and a low-emission transport mode. But the management of CWT in the unpredictable conditions of rivers, including climate conditions and water levels, is challenging. Larger boats may be harder to navigate but are safer on rapid waters. They also have higher carrying capacity and lower unit operating costs. But, safety needs to be considered. If the size of boats and the speed at which they travel are unregulated, the risk of boat collisions and accidents can be high.

Environmental problems and risks associated with CWT include canalisation and dredging (reactivation of polluted sediments into surface waters), shipping operations (noise pollution and risks of accidents) and the importation of invasive species (water-borne diseases from bacteria and microbes that live in the river). These effects and risks can be minimised if communities can be educated and made knowledgeable about the value of rivers and mobilised to help with clearing or dredging of the small waterways.

The objectives of developing CWT are to increase market activity, to improve livelihoods and to increase access to hospitals, clinics and schools. From an economic point of view, an improved CWT will lead to better lives and livelihoods of the people. It will also allow all communities, rich and poor, to be better informed about social, economic and political developments in Sarawak.

We need to change the perception of policy makers, planners and developers that water transportation is slow, old-fashioned and outdated. By providing safe and efficient water transportation, especially for rural communities, and by embracing the rivers and sharing their natural pleasures, we have a chance to change these perceptions for the better.

Community based tourism provides income opportunities for Penan communities in Mulu.



Planning for the Future of Sarawak's Rivers

By Chung Tsung Ping

The United Nations Development Programme (UNDP) advocates change by connecting countries to knowledge, experience and resources to build a better life. Partnerships are integral to UNDP's work and, in 2006, a partnership was formed with the Sarawak Rivers Board to develop an Inland Waterway Transport (IWT) System for Sarawak.

River crossing, a daily affair for many of the rural communities along Batang Tatau who depend solely on river transport.



In the Ninth Malaysia Plan 2006–2010, it is noted that “River transport will continue to support the socio-economic and cultural development of Sarawak. In this regard, a study will be conducted to identify the potentials of developing inland water transport as an efficient alternative mode of transportation as well as promoting tourism”.

Flying into Sarawak has always been intriguing. I am mesmerised by the Sarawakian landscape of curvy rivers and its tributaries vividly displayed on a clear day from the air as the plane descends into the Land of the Hornbills. I also recall the day when I was called into the office of UNDP Resident Representative for Malaysia, Singapore and Brunei Darussalam, Dr Richard Leete, to be given the task of seeking an international transport economist. Little did I realise that this task would contribute to an exciting project and partnership with Sarawak Rivers Board (SRB) along with other key stakeholders, the Ministry of Infrastructure and Communication Development (MIDCOM), the Sarawak Planning Unit (SPU) and the Malaysian Economic Planning Unit (EPU).

The search for a transport economist was not an easy one as I sought the help of UNDP's global knowledge network. The UNDP knowledge network helps to connect UNDP Malaysia with all UNDP Country Offices (COs), Regional Offices and headquarters in New York. Through this global development network, UNDP and key stakeholders share information on best practices and lessons learned from the various development projects

In the rural areas everyone, including children, contributes to the family's income.



Jessica giving dad a helping hand on the longboat taking tourists up Sungai Lemanak.

that we undertake. A query on the subject matter was placed on the UNDP poverty reduction and environment networks, with the aim of seeking expert referrals for potential transport economist(s) specialising in river transportation, and comparative experiences of other COs with project(s) on the development of rivers and their use as a mode of transportation.

Finding a transport economist was like looking for a needle in a haystack and this was only the tip of the iceberg. I soon found myself travelling along the Batang Rajang in an express boat, capturing scenes of villages located along the longest river in Sarawak and being on the same highway as longboats, tugboats and barges. During this mission undertaken with UNDP Consultant Dr John Holt, we discovered that 80% of Kapit's population depended on the Batang Rajang as its main mode of transportation. The Batang Rajang provided the people of Kapit with connections to Song, Belaga and

Sibu, the main hub in the Central Region of Sarawak. In the interiors, communities are dependant on the rivers to access basic amenities such as schools and health services. While an express boat service is available for travel from Sibu to Kapit (three hours) and Kapit to Belaga (five hours), communities living in the interior rely on their own longboats for travel along the tributaries of the Batang Rajang.

Based on the findings from the mission, a project document was developed to detail the partnership between UNDP and SRB. In consultation with stakeholders, we developed a project that aimed to prepare a Master Plan for the development of the Inland Waterway Transport (IWT) System of Sarawak. This Master Plan for SRB will focus on developing a community water transport system; (1) to improve mobility and access to economic and social services, particularly in the rural areas; (2) to explore the creation of an

Express boats – with no roads, boats are the only means of transport to Kapit along Batang Rajang.



inter-modal transport network that will help sustain inland waterways as the main mode of transport; and (3) to investigate the development of potential and sustainable riverine tourism. In the consideration of the expansion of riverine tourism in Sarawak and the other elements in the project, the potential impact of IWT development on the environment will be included. In addition, the safety of river usage is essential and should feature in any proposals towards the development of Sarawak's IWT system. This project also aims to build and strengthen the capacity of institutions, particularly the SRB, as the role of rivers in Sarawak increases.

The development of riverine transportation in Sarawak through this project supports UNDP's view that such infrastructure has a direct and indirect impact on human poverty reduction, thus playing a significant role in the achievement of the United Nations Millennium Development Goals. The impact of developing riverine transportation directly improves access to basic amenities such as health and educational services and indirectly enhances economic growth. For example, we have been informed that boat ambulances in Vietnam bring health services to people, and access to schooling for children have been made possible through the provision of boats to remote underprivileged communities. In Bangladesh, some four million people are said to earn their living transporting foods and passengers along the country's waterways, providing an estimated 60% of all employment in the transport sector – lessons and knowledge gleamed from UNDP global knowledge network.

As I reflect on my experience ala Iban longhouse – the hospitality, the *ngajat*, *miring* and longboat rides, I have an appreciation for Sarawakian culture and recognise the value of the rivers in Sarawak. I am optimistic that the beauty, potential and power of the rivers will be revealed through significant activities of the project. I look forward to the development of a feasible and sustainable Master Plan through this collaborative project and partnership with SRB.



The *Ngajat*, a traditional Iban dance performed at Rumah Juan, Sungai Lemanak.

Sarawak's Rivers: the Streets of Tomorrow

By Sharon Ng



A natural 'River Boulevard', Sungai Skrang lined with majestic ancient 'Ensurai' trees.

The best streets are about the experience of wandering through a realm where we get a sense of the community, its history and its natural, unique beauty.

Every major city in the world has an easily recognisable and loved street. Listed in the tourist guide as a destination and picture-postcard opportunity, you can expect a major thoroughfare, bustling with pedestrians and vehicles, often lined with interesting activities, trees and buildings.

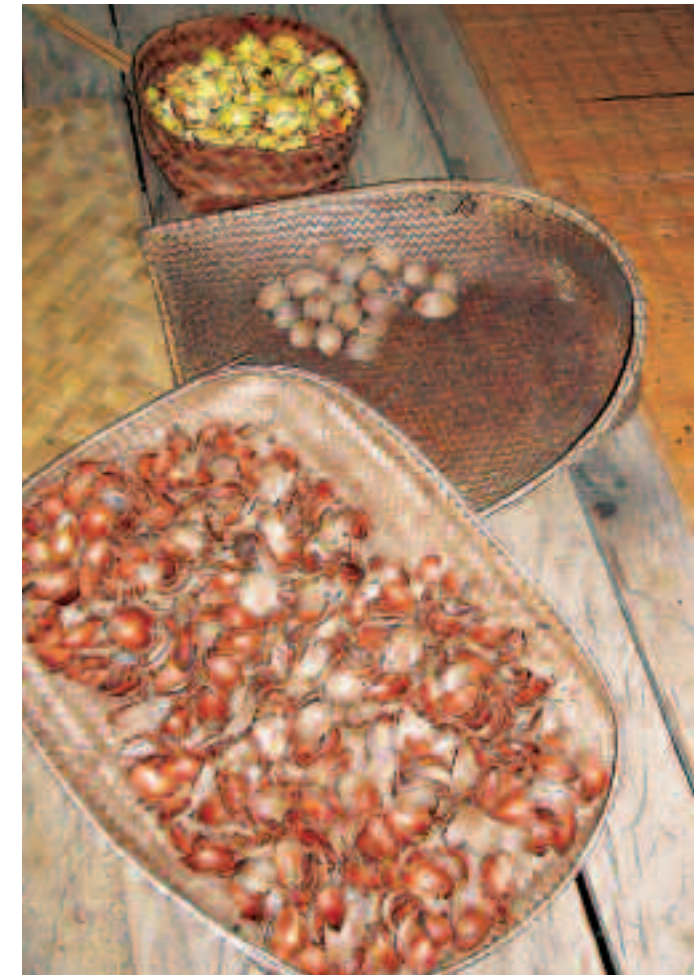
Paris is associated with the Champs Elysees, Los Angeles with Rodeo Drive, Barcelona with The Ramblas, Edinburgh with Princess Street and, closer to home, Singapore with Orchard Road. It is interesting to note that Allan Jacobs includes Venice's Grand Canal in his book, *Great Streets*, as it has all the qualities of a great street, even though it is a canal.

In the Sarawakian context, you might picture this analogy of a river as a street more clearly in the rural areas where, instead of roads, there is only a river which serves as a means of transportation.

As we travel through Sarawak, we begin to see the beauty and potential of Sarawak's rivers. When my SRB colleague, Jose Galang, and I visited Sungai Skrang and Sungai Lemanak in Sri Aman in February 2007, we discovered that a one-hour boat ride up the river takes you to a whole new different world. It is clear why the best streets are not just thoroughfares or passages we move through, but are also about the experience of wandering through a realm where we get a sense of the community and its history and natural, unique beauty.

Along the Skrang, it was the *engkabang* (*Shorea macrophylla*) season. The *engkabang*, a nut that is dried and processed for edible oil, is unique to the upper reaches of the rivers.

Engkabang – a nut that is peeled, dried and processed for edible oil.



If you journey up the river lined with *ensurai* (*Dipterocarpus oblongilofolius*) trees that form a graceful, natural arched canopy along the waterway, it almost feels like a “river boulevard” lined with ancient majestic trees. You will sometimes see the *engkabang* gently floating down like paper propellers into the river, especially when it rains. The locals collect the floating nut, peel and dry it before selling it for around RM1.80 per kilogramme to the factories for processing, a lot of hard work for some extra seasonal income.

This is a community activity and everyone is involved. As we ventured into the smaller tributaries of the Skrang, or the “local streets,” we are often welcomed into the longhouses for a chat and refreshments. It is in here that we see mothers with very young children and the very old clean the *engkabang*, while the younger members of the longhouse, and even children, collect and transfer the harvest in home-made baskets up and down the muddy riverbanks. It was scenes like these and the hospitality we enjoyed that made the boat ride upriver a memorable journey.

If we take an everyday street, for example, the minimum standards for a functional street include clearly marked lanes for safety, no potholes, clear signage, lighting, a row of trees to provide shade and, let’s not forget, civil drivers who understand and adhere to the road rules. We are aware of how much effort is needed in maintaining the condition of the roads and trimming the trees and how much manpower is required to enforce road rules as well as funding to maintain, build and improve facilities. Similarly for a river, all these aspects need to be looked after, with the added challenge that a river is a constantly moving, natural thoroughfare, with currents, surges and tidal movements which cause bank erosions, silting and debris that can impact a river for kilometres along its length.

Each great street has its own character and history and so does Sarawak’s unique rivers. I have heard people refer to “the mighty Batang Rajang,” “tranquil Skrang,” or “Sungai Buaya” (Crocodile River) in reference to Batang Lupar. We want to encourage more people to travel inland and experience the life along these rivers, catch a glimpse of how rural communities live and work, take in the natural beauty and, perhaps, at the end of the day, take away a few picture-postcard moments of the people and the local “streets of Sarawak”.

Below: Iban women collect the *engkabang* along the rivers in handmade woven baskets. Opposite: The river is swollen with *engkabang*. The community works from dawn to dusk to harvest the nut before the river carries away their bounty.



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Engkabang season, sometime only once in four years, is a time when the community, old and young, work for a little extra income.

Riverscapes of Sarawak: Backyard or Waterfront

By Geneve Tan

The Singapore River and Kuching Waterfront share similar histories. Having begun as centres of economic and social activities, both waterfronts have since transformed from working rivers to become the cities' pride and joy.

When we design a house, the 'front' is usually a space where we welcome guests, typically with a nicely landscaped garden to give a good first impression. The 'back' is planned as a utility area, away from the public's eye, where we have our kitchen, toilets, laundry area and, in some cases, garbage bin centres facing service lanes.

For most river settlements, there is also a front and a back. As planners, we think about how the riverscape should be – the visible features of the land area abutting the river which includes physical features such as landforms and buildings, living elements of flora and fauna, variable elements such as lighting and weather conditions and human elements, i.e. human activities.



Children flying kites along the boardwalks of Awat Awat, Lawas.

There is currently a global movement to revamp waterfronts in cities, creating vibrant urban spaces, like the River Thames in England with the construction of the London Eye, or the transformation of the foreshores of Nerang River in Surfers Paradise, Gold Coast, Australia, into prime high-rise residential districts.

In the Asia region, an example of good waterfront revitalisation is the Singapore River, a huge two-tier task involving a multi-agency effort. In the early 1900s, the Singapore River was polluted by oil spills from *twakows* (bumboats), waste from gambier and sago processing industries, hawkers and markets, as well as raw sewage from illegal squatters. It took about 10 years from 1987 to clean up the Singapore River by relocating pollutive industries, resettling street hawkers, removing squatters and clearing debris, as well as repairing and strengthening retaining walls along its riverbanks.

In 1994, the Urban Redevelopment Authority (URA) of Singapore finalised a comprehensive development plan to transform the Singapore River into a waterway which “provides waterfront housing, enjoyment and fun to present and future generations of Singaporeans” (URA1994). Today, as I travel along



Tourists enjoying the clean waters of Sungai Lemanak.

Boat Quay, Clarke Quay and Robertson Quay, I can see how they have become the city's popular waterfront public spaces, synonymous with alfresco dining, entertainment, shopping and prime commercial and riverfront residential properties.

Similarly, the Kuching Waterfront along Sungai Sarawak took major restoration and land reclamation before it became a vital shared urban space, one of the most popular meeting places in the city.

There are many rural waterfronts identified for conservation as heritage areas as well. In 1997, the American Heritage Rivers Initiative was created to assist communities in revitalising their rivers and riverfront areas with the aim of enhancing their enjoyment of the historic, cultural, recreational, economic and environmental value of their rivers and to protect the health of its communities. Fourteen rivers were designated as American Heritage Rivers, including the upper Mississippi River, where on-going projects are converting more than a dozen brownfield sites into green spaces and improving public access.

We must accept that such developments will be a long process, and we have to start thinking about our riverscapes. While the state continues to improve its urban riverfronts in cities such as Bintulu, with its upcoming Waterfront Promenade, there is still a lot of work to do here, especially in towns like Kapit along Batang Rajang, as Sarawak has the most riverfronts — over 5,000 kilometres in length — in Malaysia.

As I travel up Batang Oya in Dalat, it's astonishing to see, instead of jetties and pontoons, rows and rows of floating toilets, the most consistent feature lining the riverfront.

In Dalat, the river serves as a natural sewage system not only for domestic waste but also for industrial waste discharged from, for example, sago processing plants. At the same time, its riverbanks are used for storing sago tree harvests, waiting to be picked up for processing.

These scenes trigger the thought of “what is done upstream comes downriver”. Everyone downriver will be affected by what takes place upriver. Hence, whenever I see children playing in the river or taking a communal bath, I worry about what happens upstream.



Cottage industries like processing prawns use water directly from Sungai Meludam for washing.

Some rural communities live in riverfront homes, locations which urban dwellers will envy. Water villages like Awat-Awat in Lawas seem to be ideal, with fresh air, open boardwalks where the children play and pleasant views. Yet, these villages have an unappealing side, especially during low tide, when a peek underneath the stilts of some of the homes reveal that domestic waste discharges directly into the water.

Besides thinking about what we want the future of our rivers to be, we also need to take care of the rivers that do not need 'saving' but requires us to make a proactive effort to preserve them, for example, in Julau, Skrang and Lemanak.

Sarawak has the opportunity to define its riverscapes as Malaysia is trying to turn its backyards

along riverfronts into public spaces. A recent effort is the restoration of the riverfront in Malacca, coupled with historical buildings that further enhance the town's character.

The revitalisation of Sarawak's riverfronts is not just about landscaping or beautification. The environment is also a challenge. It is a big task that should be a two-pronged effort that involves all stakeholders, including the Sarawak Rivers Board (SRB). First, to provide basic amenities such as sewage and safe landing wharves and remove or minimise the sources of pollution and, secondly, to establish the type of urban or rural riverscapes that Sarawak should strive for: prime waterfront properties or green spaces? It is time to start planning now.



Along the Batang Oya, it's astonishing to see, instead of jetties and pontoons, rows and rows of floating toilets, the most consistent feature lining the riverfront. These scenes trigger the thought of "what is done upstream comes downriver".

“At the end of the day, how we treat the rivers boils down to education and respect for the environment we live in.”

— Dr Stephen Rundi
Chairman, Sarawak Rivers Board



CHAPTER V

Six Degrees of Separation

By Geneve Tan

Every river has a human ecosystem. Your life and your actions are a lot more connected to the river than you think.

I never quite understood how a river could flow backwards but, twice a week, I notice this strange phenomenon.

The water level in Sungai Sarawak will rise and flow over low-lying river embankments. The currents become unusually swift and flow in the opposite direction upriver. When the water level peaks, the kids at Kampong Boyan, across the river from Kuching city, will come out for a dip in the river.

The river is related to a complex web of human interactions and it wasn't until a visit to the Kuching Barrage, which is about 20 minutes from Kuching city, that this human-river interactive relationship became clearer. Think of the weekly television drama, *Six Degrees of Separation*, based on Hungarian writer Frigyes Karinthy's suggestion that any two persons on earth could be connected to each other through a string of no more than five acquaintances.

Opposite: Encouraging the use of Sungai Sarawak for recreation activities will mean increasing the efforts to improve the river's water quality.



Reflections in the tranquil waters of Logan Bunut.

Sungai Sarawak's long-term role is to be a source of drinking water for Kuching, says Teo Swee Ann, Sarawak Rivers Board (SRB) Deputy Controller, who is in charge of the barrage.

In the future, the barrage will form a river reservoir. For now, its key responsibilities are to mitigate the risk of flooding, maintain river water levels, regulate river traffic through a shiplock and connect opposite riverbanks via its vehicular causeway link.

As Teo puts it, "The barrage's control tower is no different from that of an airport control tower." Every decision affects the river and its community.

Water sustains life. However, most of us underestimate the power of water. Kuching receives 3,800mm of annual rainfall, half of which falls during the annual north-east monsoon from November to

February. It only takes an average rainfall of 500mm over three days in the Sungai Sarawak catchment area to put Kuching at risk of flooding.

Originally built to contain water, it is ironic that the barrage is now used to drain water to reduce the risk of flooding. With the help of rainfall sensors and a flood-warning system linked to Kuching's catchment areas, the barrage can discharge about 12,600 megalitres of water an hour. Based on Kuching's average daily water consumption, this can sustain its population for more than 50 days. Captain Thomas Goh, General Manager of Kuching Barrage Management Sdn Bhd contracted by SRB, joked, "if only we could convert the water discharged into cash by collecting the water and selling it to water-scarce countries like Australia".

Besides ensuring river safety, the barrage's priority is also to maintain the health of the river and its community.

Teo Swee Ann, SRB Deputy Controller, explaining the Kuching Barrage's multiple roles.



Kuching Barrage's control tower monitors rainfall sensors upstream, a flood warning system and the shiplock.

The river can become contaminated by sewage and wastewater runoff and its water quality, in terms of its physical, chemical and bacteriological characteristics, is monitored monthly.

To regulate the water quality, the river and city drains are flushed twice a week. The barrage's five massive gates (each weighing 180 tones) will be opened to flood the river and drains to about 1.5m above mean sea level, reaching partially into the city's network of drains, and then drained to a safe level.

The quality and the quantity of the river water also affects industries upriver in the Sama Jaya Free Industrial Zone, as the water extracted for their operations have to meet their standards to avoid interruptions in their production lines.

Even with regular flushing, Kuching's river water quality has to be improved if Sungai Sarawak is to become our source of drinking water.

SRB Chairman Dr Stephen Rundi grew up in a longhouse along Batang Kemena, where the river had always been a way of life. He remembers paddling two hours to get to school, bathing in the river and fishing for his dinner. In the rural area, everyone knew that the river was the source of life and were taught to respect it.

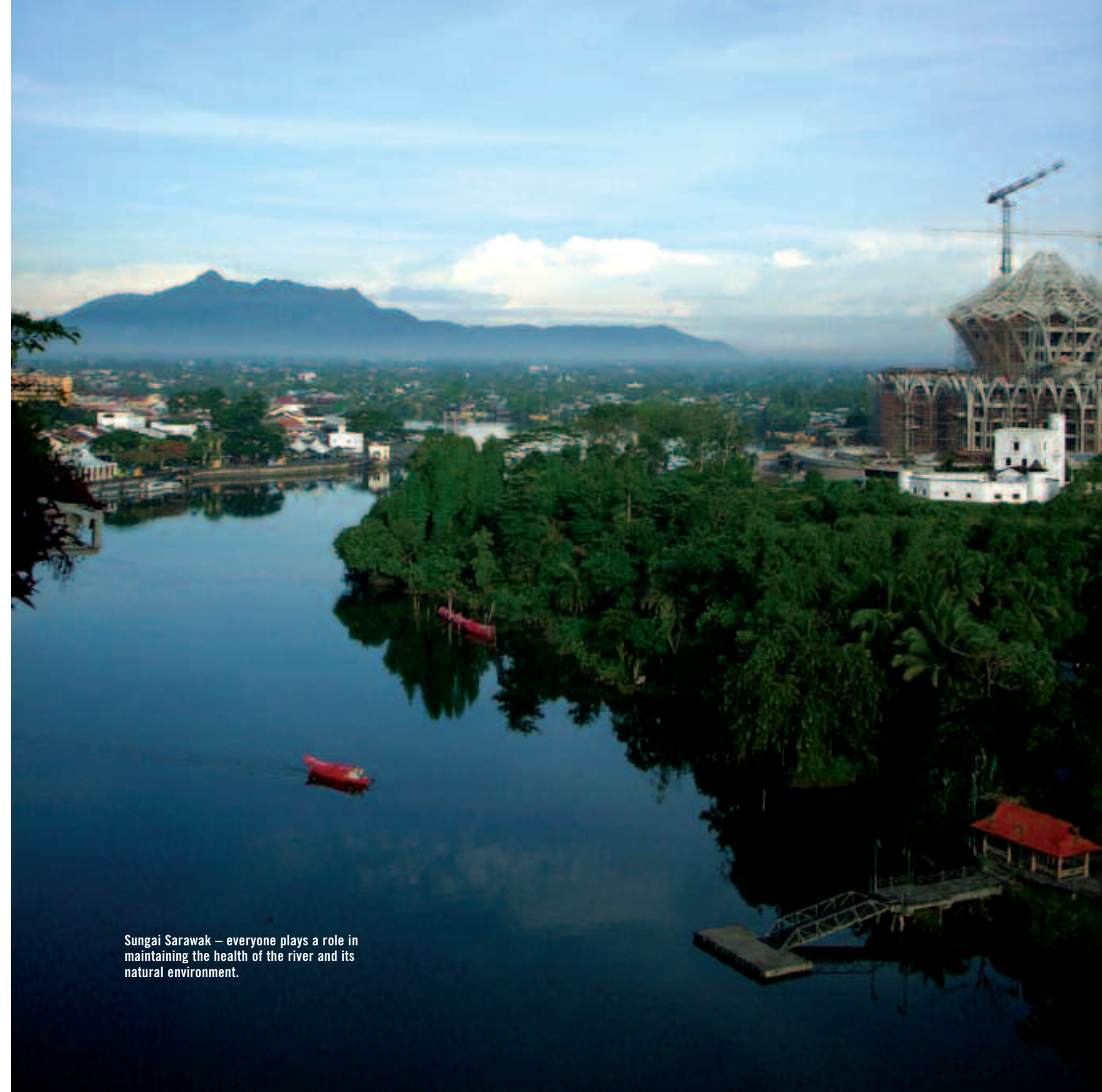
Today, the rivers are most polluted in the urban areas and upstream pollution is caused by industries, large-scale agriculture and logging activities. Dr Rundi believes that, at the end of the day, how we treat the rivers boils down to education and respect for the environment we live in.

It was, he says, more than just about whose responsibility it is to clean the rivers and drains. It is also about changing public perception: the river is not a dumping ground; it is a source of life and understanding the river's human ecosystem and the role each of us plays in the well-being of the river is one of the key activities for SRB.

So, every time you see someone throwing rubbish into the drain, know that it is connected to you, the fishermen, the children swimming in the river, the industries upriver and the person who has to clean up the river.

Sungai Sarawak has a unique human ecosystem. If everyone is connected by six degrees of separation, then each of us has the responsibility to ensure the health of the river and safeguard it as our future water resource.

Kuching Waterfront at dusk.



Sungai Sarawak – everyone plays a role in maintaining the health of the river and its natural environment.