

EAROPH is an Eastern Regional Organisation founded by the International Federation of Planning and Housing (IFHP) in 1954. In 1980, IFHP granted EAROPH autonomy. It is a multi-disciplinary and multi-sectoral organisation for sustainable human settlements with its secretariat in Kuala Lumpur, Malaysia.

EAROPH-Australia is a National Chapter that adapts the principles and activities of EAROPH to benefit Australia.

APIGAM is an acronym: **Asia Pacific Institute of Good Asset Management**. It is EAROPH's internal institute (2003) for the introduction of principles and practice of Systemic Asset Management for developing countries in the EAROPH Region. Since its founder and chief officer, KC Leong, has moved to Australia, APIGAM is now under the care of EAROPH-Australia.

THE HOLISTIC AND PEOPLE-FOCUSED APPROACH IN SYSTEMIC ASSET MANAGEMENT (SAM)

By KC Leong

The complexity and final features of any kind of development will depend on the set of physical components chosen to guide that development. In view of this, a specific development is a systems process of a network of related components, sub-components and sub-sub-components down to the smallest components. This is the internal physical structure of a development.

The purpose of any development is to provide a specific service for the fulfilment of human needs. For this reason, a development is called an infrastructure; be it a building, such as a community hall, a railway station, a house, or a library; or a complex of buildings, such as a school, a hospital, or a road network including roads, bridges, tunnels, embankments, drains, culverts, etc. Some of these infrastructures are complex systems of systems, such as a water supply system comprising:

- a raw water collection system – a lake, a river or other groundwater sources,
- a raw water storage system, or reservoir,
- a water treatment system,
- a water pumping station,
- a water tower for water distribution through gravity,
- a water distribution network to consumers, and
- a water supply administrative system which include planning, development, operation, maintenance, financial management and consumer management.

Because services from infrastructures are valuable in that they enhance citizens' quality of life, infrastructure management is also called asset management. But, such services may fail due to component deterioration, or due to external factors such as political pressures, poor overall management, financial management, or natural disasters. When infrastructure breaks down, a public service is interrupted and the people's routines are affected. If the breakdown is severe and the service provision collapses altogether, the infrastructure is no longer an asset but a liability that adversely affects the quality of life of the people. In such a situation, the poorer the community, the more they suffer, as they lack alternatives to get them out of their misery.

Physical assets of infrastructure are systems assets, because each asset system is internally related to their components, sub-components and sub-sub-components; very often they are also related to other systems assets—For example, the system of groundwater contamination can affect the quality of the water supply system, which in turn can also affect the wellbeing of a human settlement. Consequently, in asset management not only do we need to control the systems asset itself, we must also take notice of the external forces/events that are impacting each asset system—even though no two factors are the same and neither do we know when exactly each factor will strike. In a nutshell, this is Systemic Asset Management (SAM).

Although SAM is highly complex, we in APIGAM believe that only this holistic and practical approach can manage infrastructure for sustainable human settlements, especially with respect to developing countries in the Asia Pacific Region of EAROPH. Because of SAM's complexity, I have been encouraged to complete my second book entitled "Systemic Asset Management (SAM) for Developing Countries—The People-Focused Approach".¹ The book will be published during 2014. Why focus on developing countries? Developed countries in the West, including Australia and New Zealand have a habit of advising these countries in the EAROPH region to follow their existing Asset Management manuals. To their disappointment, much of the information cited in the manuals is ill suited to local conditions and culture, and they have wasted resources investing in them. Under SAM, manuals are prepared to suit surrounding social, economic, political and environmental conditions under local legislative standards. As no two urban settlements are the same, no one-size-shoe can fit them all, which is one of the principles of SAM.

Now, let me come to Bob Williams' "evaluation" in general and "systems-based evaluation" in particular. Unless we know the objectives, rules and criteria under which a development has been carried out, any evaluation of the finished product and subsequent service performance would only be a fruitless exercise, either to please or to condemn—nothing more than a feasibility study.

On the other hand, a Systems-Based Evaluation can only be carried out on a development and its services that have been systemically planned, developed and maintained; otherwise it is a waste of effort. Even in such a situation, it is important to have prior knowledge of how systemic the development's planning and implementation are and how systemic are its operation and maintenance, in order to be sure that Systems-Based Evaluation could be carried out effectively—otherwise, the systemic evaluation process will bog down along the way.

As mentioned earlier in this paper, SAM is a holistic process; covering all encompassing factors, in relation to the conditions of an infrastructure system's internal physical components and all other externally related infrastructure components, as well as a spectrum of social, economic, political and environmental dimensions. Some external factors may be hidden or dormant, but when they surface and impact on the performance of the asset system, it must have the resiliency to withstand an emergency

¹ KC Leong's first book "The Essence of Asset Management—A Guide" was published by UNDP Malaysia in association with EAROPH and APIGAM and launched in the EAROPH 2004 World Planning & Housing Congress held in Melbourne.

situation. A Systems-Based Evaluation will gauge this resiliency and assess the standard of performance under a diverse set of situations.

In SAM, we need to understand the following basics about infrastructure:

- Why are infrastructures, whether huge or small regarded as systems?
- Why are infrastructure systems called assets?
- Life span and life cycles of asset systems
- Deterioration characteristics of infrastructure assets
- When assets fail ...
- Asset failures and chain-reactions
- Social costs ...
- Continuity and change of assets with reference to the quality of life
- Natural ecosystems and man-made cultural ecosystems
- Systems thinking and SAM – Learning from Nature
- ...

We must also understand the Principles of SAM:

1. What is Asset Management?
2. Why systemic, why SAM?
3. Systematic Vs. Systemic
4. Dynamic balance of interrelationships and interdependencies
5. SAM and Epistemology – to establish a fit-for-purpose e-Asset Register databank for a comprehensive management of an asset ...
6. SAM and Homeostasis – to regularly improve the asset system and maintain optimal performance ...
7. SAM and Autopoiesis – to regenerate an organization through self-renewal processes as Nature does and to render an organization a living entity through new connections in the autopoietic network ...
8. SAM and Financial Management
 - Accrual Accounting process
 - Non-straight-line depreciation process
 - ...
9. SAM and Life Cycle Costing and Life Cycle Management including Management of Impacts of external factors
10. SAM and Planned Asset Maintenance
11. ...

Even in following the above-mentioned Principles of SAM, it is vital for valuation experts to know the criteria and SAM processes an organization has before carrying out Systems-Based Evaluation. Understanding the basic principles of SAM is one thing. How the social, economic, political and environmental factors will affect an organization's decision on their SAM processes is another. This makes SAM and asset management evaluation more complex.

Politicians are elected to serve only for a short period. Unfortunately, this means they prefer new infrastructure development rather than setting aside reasonable budgets for infrastructure maintenance. Their ideological policies and decisions can upset

ongoing funding or even cause worse pollution, leading to hastening of climate change. All said, it is imperative that we should at least start with SAM so that we can make a start on Systems-Based Evaluation to reveal mistakes, negligence and shortcomings in our dealings with the development and maintenance of infrastructure asset systems including public health, natural resources, groundwater management and all other public development schemes.

Nature has created this living world. The ecosystem is large and complex. It is time for all humans to learn from nature and embrace systems thinking. Whatever the creation, be it a forest or a cell in a human heart, it keeps functioning with no waste while new plants and new cells are regenerated. Nature gives us humans the power and capacity of living; we must not destroy these gifts.

KC Leong

Chief Officer & Founder of APIGAM (present since 2003)

Honorary President of EAROPH – present since 1986

Director of Membership, EAROPH-Australia – present since its formation in 2010

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