The Governance of Knowledge

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Contents

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Abstract

Knowledge has been defined as a major resource for development. Especially countries without natural resources have found this idea attractive and have embarked on development strategies to develop a knowledge-based economy. In doing so they may fall into a "knowledge trap". The paper postulates an "epistemic backlash", because an increase of knowledge leads to an even greater increase of ignorance, which is accompanied by an increase of risk and an increase of necessary research funds for the next stage of development. A shortage of high-level manpower is likely to occur, which will reduce the chances for further knowledge-based development. A careful governance of knowledge is needed to avoid the "knowledge trap". Five knowledge strategies are discussed: developing an ICT infrastructure, creating knowledge-clusters, creating knowledge-hubs and centres of excellence and creating comparative advantages through the use of local knowledge. Examples are drawn and data presented from Brunei Darussalam, Malaysia and Singapore.

The Governance of Knowledge

1. Introduction: Knowledge for Development

By the middle of the last century a paradigm shift in development policies took place. The question was asked: How can resource poor countries develop in a world of increasing demand and rising prices for raw materials, especially fossil fuel. What can be done to pay for ever higher prices for fossil energy and heavy metals while striving for the status of an industrialised country? This question was asked by Vietnamese, Malaysian and Thai politicians, whereas the question never arose in oil-rich Brunei Darussalam. How can human resources be utilized to raise countries above the low income levels? The World Development Report of 1998/1999 summarized current thinking at that time by identifying "knowledge" as the new factor of production. In a by now famous study, comparing the development path of South Korea and Ghana the World Bank economists concluded that the input of the classical factors of production land, capital and labour could only explain a fraction of the different development paths of Ghana and Korea. The rest could be attributed to the much higher input of "knowledge" into Korea's development efforts, explaining why Korea surged ahead to become one of the world's leading industrial countries while Ghana was left behind. This actually rather simplistic argument legitimized increasing funds for research into "knowledge for development (K4D)" and a host of development programmes. Singapore, among other countries, was often cited as an example, how a country without any natural resources could develop into an industrial high tech economy through a consistent science and knowledge policy. The "knowledge assessment method (KAM)" of the World Bank Institute and its data bank became a valuable instrument for development planners around the world. The idea in itself is not new. Already in 1934 Sir Winston Churchill, looking at the crumbling British Empire found consolation in the idea that "the empires of the future will be empires of the mind".

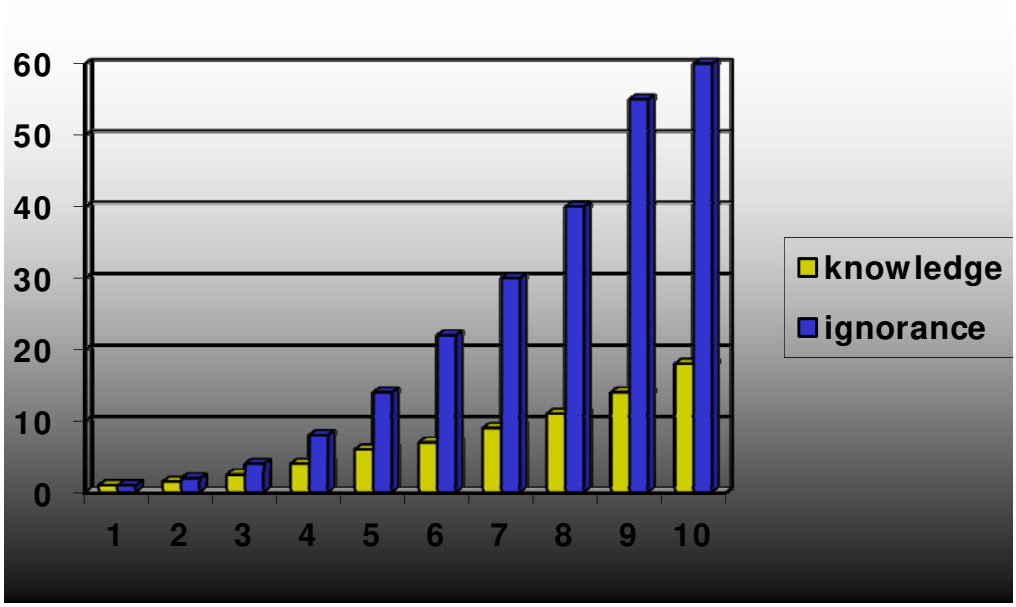
In the meantime, the euphoric acceptance of K4D has given way to a more realistic evaluation of the use of knowledge for development. In some of our studies we have identified the dilemma of "closing the digital divide", proposed by UNESCO and alerted development planners to the "knowledge trap" on the way towards a knowledge-based economy and society.

2. The Knowledge Trap and the Epistemic Backlash

Without going into the epistemology of knowledge for development we should like to draw attention to the fact that knowledge as a commodity has a number of peculiar attributes that sets it apart from other commodities. One of these is that the production of new knowledge also increases non-knowledge or "ignorance". In many cases research projects yielding new knowledge also increases the knowledge of what we do not know. The typical final report of a successful research project states that the initial research problem has been resolved, i.e. that our knowledge on a certain topic has increased, followed by a statement that during the research new problems have emerged that need further research (and, of course, funding). For each problem solved, more problems emerge. I linear increase of knowledge is accompanied by an exponential increase on knowledge about what we don't know. To put it bluntly, an increase of knowledge leads to an even greater increase of ignorance, which can be described as an "epistemological backlash". This increase of "ignorance" is accompanied by an increase of risk and an increase of necessary research

funds for the next stage of development. This is one aspect of the “knowledge trap” into which projects and governments have to avoid.

Figure 1 Knowledge and Ignorance



(Source: data based on assumptions, for illustration of the problem only)

Another part of the “knowledge trap” is based on the observation that an increase of knowledge input into the economy and society is only possible with an increasing use of knowledge. Knowledge has a peculiarly shaped supply and demand curve. The demand for knowledge rises with increasing supply of knowledge. This is the case because knowledge production and utilization for productive purposes need further knowledge as a resource. This is usually indicated by an increasing demand for high-level manpower and the need to establish large research institutes and think tanks. Both demands are difficult and expensive to be fulfilled and governments may fall into this “knowledge trap”, if they cannot meet this demand because of shortcomings in their own system of higher education or they do not have the financial means to attract expensive talents or equip high-level research institutions. Singapore has avoided this “knowledge trap” by importing foreign academics and investing heavily in research infrastructure (NUS, A*Star etc), whereas Malaysia has fallen into the “knowledge trap” by ethnically motivated recruitment policies for research and university staff and under-financing of higher education. Existing expertise is underutilized and there is not enough knowledge to produce new knowledge in universities and research institutes.

Brunei Darussalam as a resource rich economy has not been under pressure to develop its own knowledge base and has run its economy largely by outsourcing R&D, though a turn in policies to avoid the knowledge trap is slowly taking place, though so far very slowly and with only limited success despite its large Per Capita GDP. These examples will be further elaborated in the following sections of this paper.

3. Knowledge Strategies and the Governance of Knowledge

We shall briefly discuss the following five knowledge strategies:

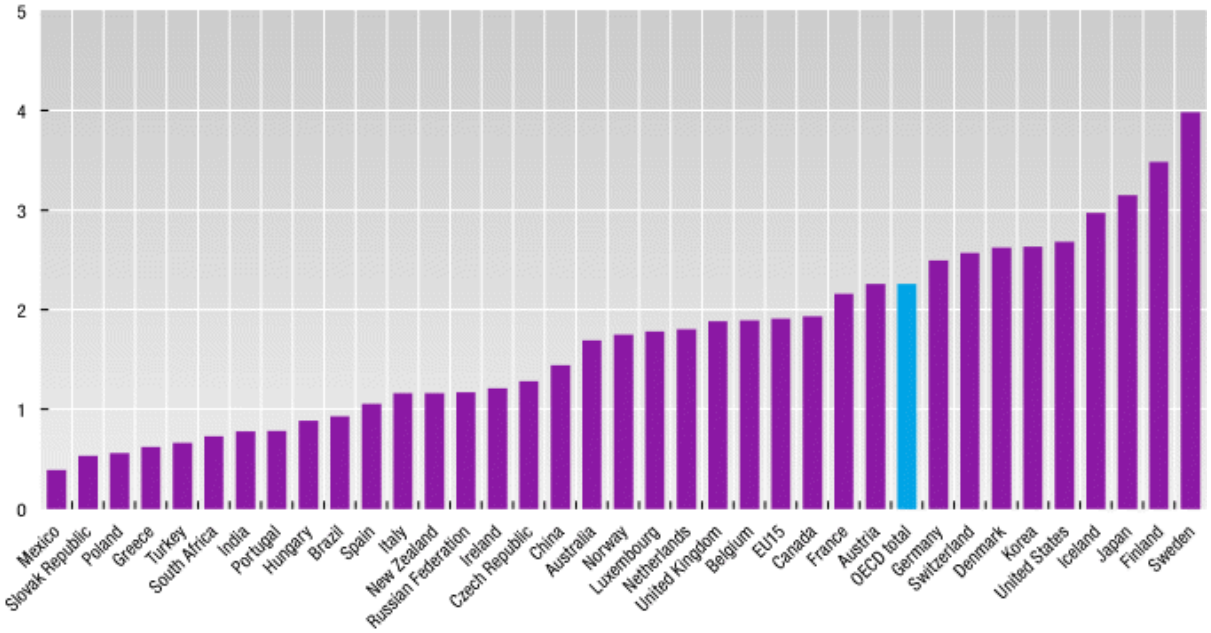
A. Develop an ICT infrastructure
B. Create k-clusters

C. Create K-hubs & centres of excellence
D. Create comparative advantages through local knowledge

The backbone of any knowledge-based economy is a fast internet connection. Developing a glass fibre optic net improves access to the internet. Realizing that a full coverage of the peninsular Malaysia, let alone the vast states of Sabah and Sarawak would be out of the question, the Malaysian government under its Prime Minister Mahathir has created the Multi Media Super Corridor, with high speed internet connections to lure high tech foreign investment to Malaysia. Fiber-optic networks have also been created in parts of Kuala Lumpur and Penang, but a total coverage like in Singapore and in some European countries is still not achieved. Despite these efforts other technological advancements like the spread of smart phones and tablet computers are gobbling up cyberspace. Massive further investments in the ICT infrastructure will be necessary to keep the flow of information and knowledge going, in addition to chats, steaming of videos and songs that are expanding fast and create bottlenecks in data transmission.

As argued above, knowledge is needed to create or utilize knowledge. Most ASEAN states, especially Singapore, Malaysia and Brunei have given up an equalizing policy of higher education. Educational and science policy are directed towards the creation of centres of excellence, like the APEX university system in Malaysia or the turn towards research and research funding within the Universiti Brunei Darussalam, which is striving to climb up the ladder of academic success as measured by various indicators. R&D expenditure, still low in most ASEAN countries except Singapore, will have to rise above the average of higher than 2% of GDP of OECD countries.

Figure 2 R&D Expenditure as % of GDP, 2004



Source: OECD

Slogans like being a “first class international university” reaching place 50 on a ranking of Asian universities (UBD vision) or using key performance indicators (KPI) to measure and compare achievements will do little without considerable recruitment of qualified academic staff and massive investment in universities and research centres.

4. Epistemic Landscaping

Developing a knowledge-based economy and society requires a comprehensive approach as well as regional planning. We use the term “epistemic landscaping” to emphasize the often neglected aspect of knowledge governance, namely that the development of a knowledge based economy and society requires more than ICT and engineering. It will be necessary to develop ICT facilities, educational and research institutions, closely knit knowledge clusters and knowledge hubs and a host of government and civil society initiatives to create an epistemic landscape with high peaks of knowledge production and lower plains of basic education.

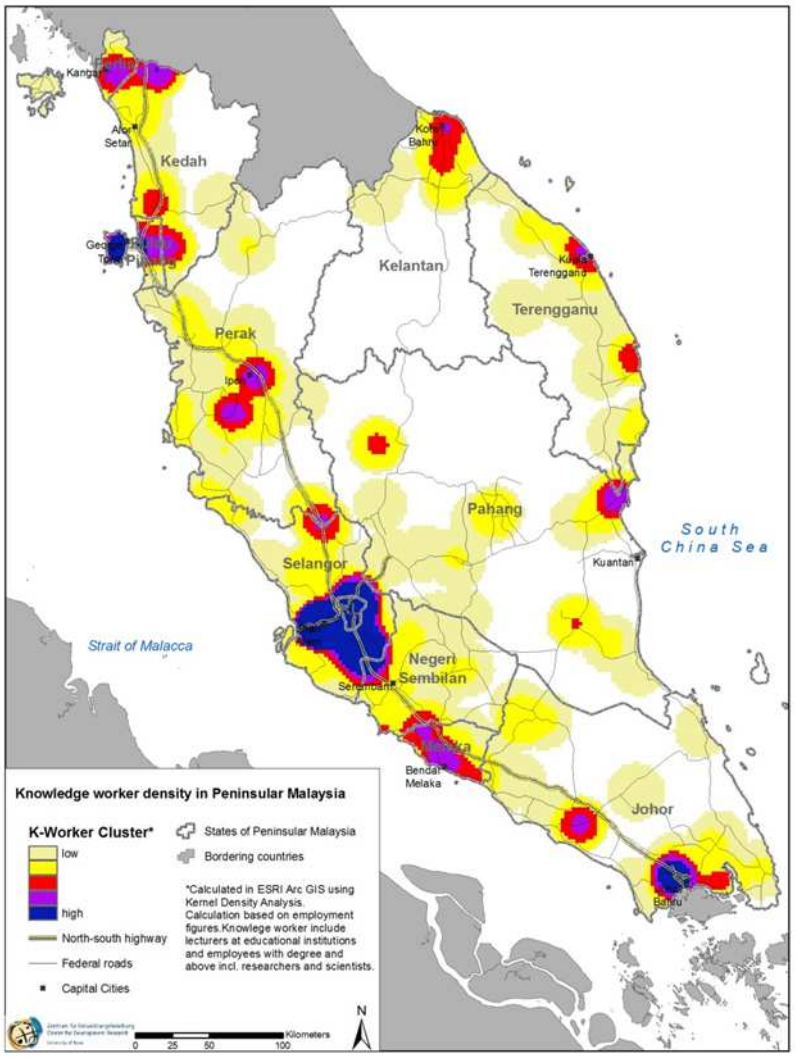
Knowledge production needs knowledge: science parks, research institutes, R&D divisions, SMEs, universities, etc in close proximity. “Naturally” grown as well as government initiated clusters now exist in many parts of the world: Silicon Valley, Hyderabad, ABC (Aachen-Bonn-Cologne), Penang, Biopolis Singapore, MSC Malaysia, Jababeka/Jakarta, HCMC, and possibly soon also Bandar Seri Begawan/Jerudong in Brunei Darussalam are knowledge clusters in epistemic landscapes.

Knowledge clusters

- contain universities and colleges, research institutions, think tanks, government research agencies and knowledge-intensive firms,
- have the organizational capability to drive innovations and create new industries,
- are central places within an epistemic landscape, i.e. in a wider structure of knowledge production and dissemination.

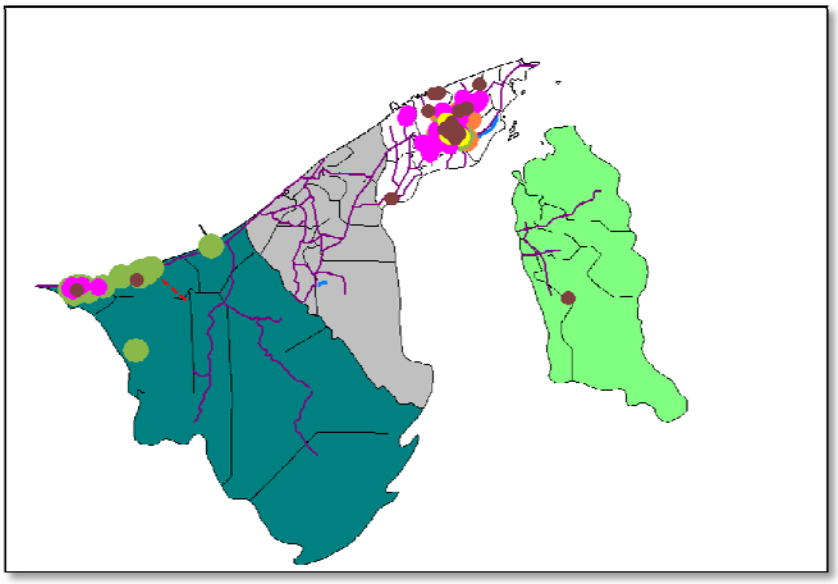
Most studies, looking at knowledge clusters as a special form of industrial clusters assume that clusters are more productive and innovative than less clustered areas. The reduction of transaction cost due to proximity has always been a forceful argument explaining the “natural” clustering of industries. This argument is weakened by the fast development of information and communication technology. A video conference can easily connect executives of various companies, government officers and scientists without concern of their respective location. ICT was often thought to reduce industrial and knowledge clustering, but as examples like the Silicon Valley or the industrial cum knowledge clusters of Cambridge UK and Massachusetts demonstrate, proximity is still an important factor in creating innovations and high-tech output. One possible reason is, as we have argued in another paper, the necessity to transfer tacit knowledge in addition to documented knowledge.

Figure 3 Knowledge Clusters in Malaysia



Though there is knowledge clustering throughout Peninsular Malaysia, three dense knowledge clusters stand out: a Northern cluster concentrated on Penang, the Klang Valley with Kuala Lumpur and the Multi Media Super Corridor with Putrajaya and Cyberjaya and the Southern cluster of Southern Johore close to Singapore. In Brunei Darussalam, a state with only about 400,000 population, clustering is very dense. Except for a small oil related cluster around Seria, almost all knowledge related organisations are located in the Bandar Seri Begawan knowledge cluster.

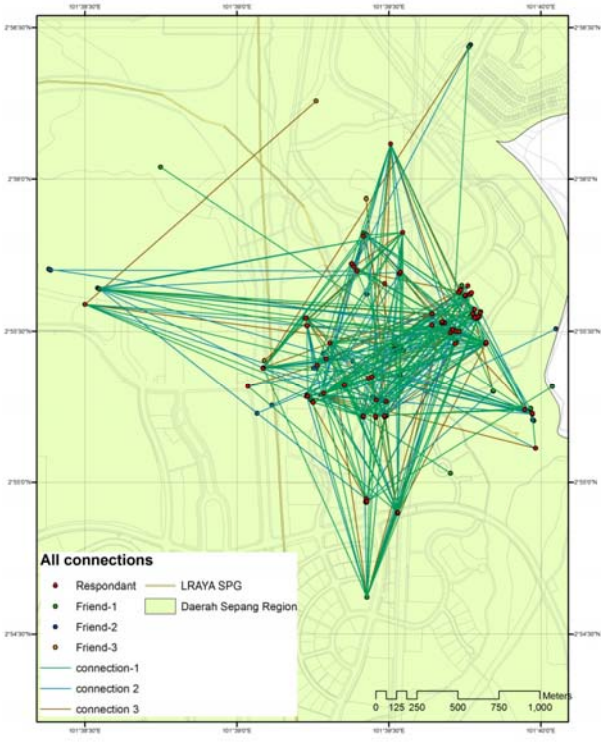
Figure 4 Knowledge Clusters in Brunei Darussalam, measured by the number of knowledge related institutions, 2011



Source: UBD Study on Brunei as a Knowledge Hub, 2012-13

Cluster-internal as well as external networking and knowledge sharing varies considerably. As our study on Ho Chi Minh City and the Mekong Delta shows, internal networking and knowledge sharing within the cluster is very low, but connections with institutions in the North Vietnamese knowledge cluster of Hanoi is preferred. The output of published research results is much lower than expected and even publications are not necessarily distributed among scholars, researchers and officials within the HCMC knowledge cluster.

Figure 5 Networking within the Cyberjaya Knowledge Cluster



Source: Nordin and Evers 2011

External networking can be comfortably measured by the number of joint publications between researchers of different universities. For companies joint product development would be a good measure. In her study of the Industrial cluster of Jababeka near Jakarta, Indonesia, Farah Purwaningrum could show that knowledge is transmitted mainly along the supply chain network of the dominant automotive industry with relatively weak linkages to universities and research institutes (Evers and Purwaningram 2013).

In Academia, joint publications show the degree of networking and scientific cooperation more than Memories of Understanding (MoU), signed in most cases by university administrators rather the researchers themselves. By using the knowledge hub function through international networking new knowledge can be accessed and data can be transmitted. These networks are still lopsided in the sense that the lead authors often come from universities and research institutes of countries with a high ratio of R&D expenditure or institutions with a relatively higher knowledge output that the co-authors. Historical connections and alumni networks appear to be additional factors in shaping the science and research networks. Thus both Malaysia and Brunei appear to have strong ties with Australia and the UK, followed by EU countries, India and China. Networking and research cooperation within the ASEAN region is surprisingly low.

Figure 6 Science Networks of Universiti Brunei Darussalam as Knowledge Hub, 2007-2011

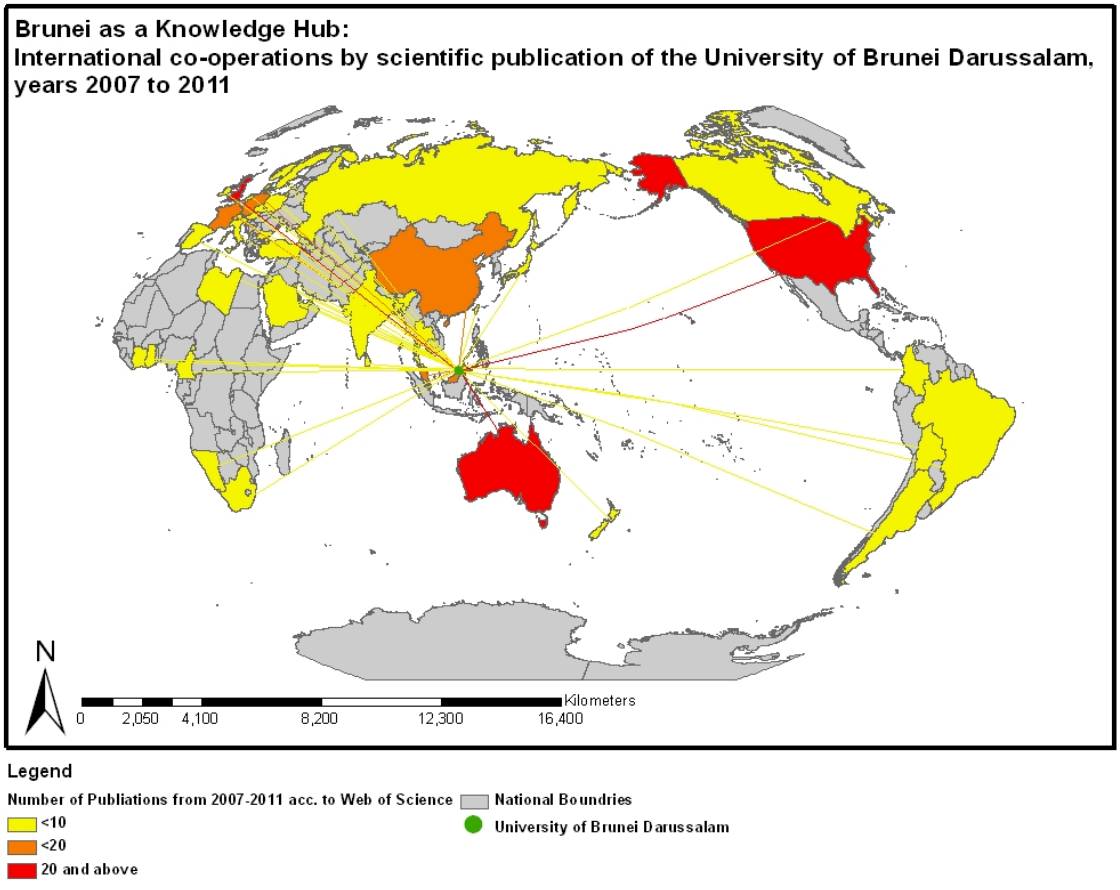
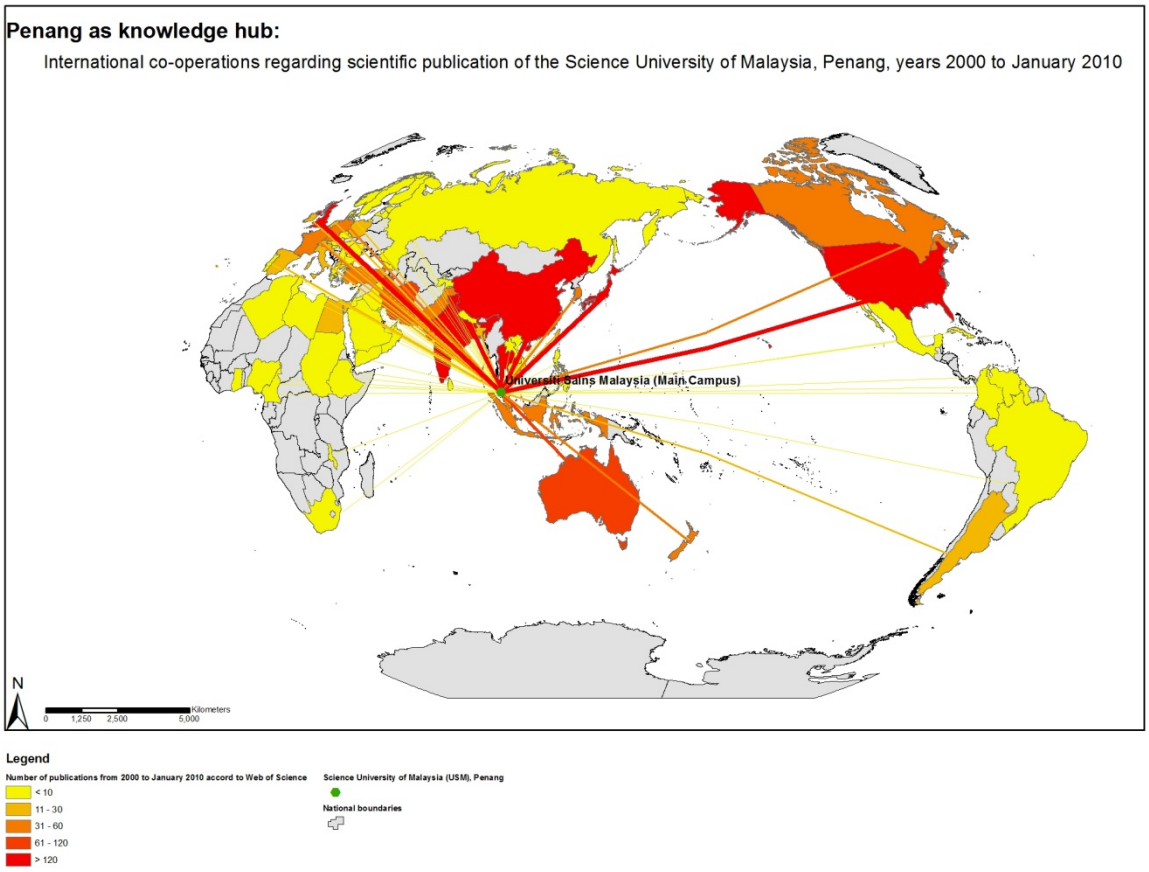
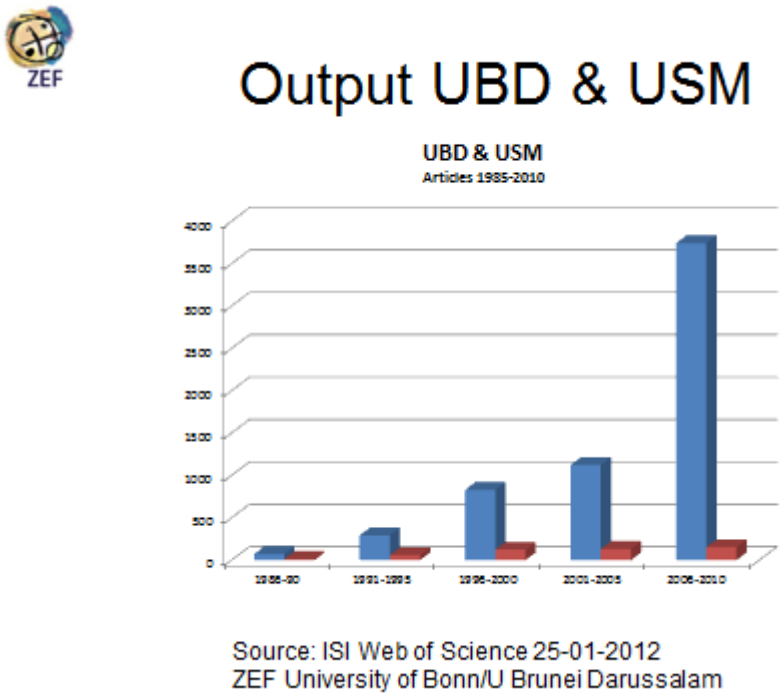


Figure 7 Science Networks of Universiti Sains Malaysia as Knowledge Hub



Reaching a productive stage of knowledge output is a long process, as the comparison of UBD and USM suggest. Both institutions have followed a policy of upgrading facilities, staff training and research funding to turn their institutions into research universities. Both universities have increased their output, tough USM with a loner time since its establishment and a larger number of academic staff and research fund is still head and defends is place of one of the leading Southeast Asian universities.

Figure 8 Knowledge Output in terms of Journal Articles, UBD and USM



5. Conclusion

A combination of knowledge clustering and well developed international knowledge hubs should result in a high output, measured by publications and patents. This is, however, only the case if two other conditions are met:

1. knowledge sharing and internal networking within the knowledge cluster
2. support of a highly trained research staff by adequate recruitment policies and research funds
3. Sufficient time to develop and nurture an epistemic culture of knowledge production.

Knowledge clusters, i.e. the assembly of research institutions, universities, government offices, consultancy business and manufacturing companies are producing new knowledge, if they also allow networking and knowledge sharing within the cluster. Universities, in particular, profit from location within a knowledge cluster.

An appropriate government policy would result in the development of a well-balanced epistemic landscape of knowledge clusters and knowledge hubs. Opening universities or research institutions in isolation is not likely to result in leading a country into a knowledge-based economy and society.

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