

Life Sciences Capital Fund

MALAYSIA CASE STUDY



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Agribusiness



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LIFE SCIENCES CAPITAL FUND, MALAYSIA CASE STUDY

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1 SUMMARY

The Malaysian Life Sciences Capital Fund (MLSCF) is a venture capital fund based in Kuala Lumpur, Malaysia. MLSCF has succeeded in transferring biotechnologies from more-developed to less-developed countries. The specific technologies of interest to the fund have the potential to significantly improve farm productivity. Two organizations—one public and the other private—co-manage MLSCF. They are the Malaysian Technology Development Corporation (MTDC), a government organization, and Burrill & Company, a San Francisco-based merchant bank. The fund manages \$150 million in committed capital. The concept underlying the fund is to pursue “science without borders” through a process of open innovation. Open innovation greatly reduces the transaction costs of technology transfer.

2 BACKGROUND AND CONTEXT

2.1 BACKGROUND

The Malaysian Life Sciences Capital Fund (MLSCF) is a venture capital fund based in Kuala Lumpur, Malaysia. It was founded in 2006 as a public-private partnership to facilitate the transfer of world-class biotechnology into Malaysia. MLSCF specializes in early-stage investments in companies that apply advanced biotechnology in the areas of agriculture, industrial chemistry and healthcare.

MLSCF has succeeded in transferring biotechnologies from more-developed to less-developed countries. The specific technologies of interest to the fund have the potential to significantly improve farm productivity.

In its technology-transfer activities MLSCF pursues two objectives: superior financial returns for its investors and the advancement of life sciences in and for the country of Malaysia. The governance structure of the fund reflects these dual objectives. Two organizations—one public and the other private—co-manage MLSCF. They are the Malaysian Technology Development Corporation (MTDC), a government organization, and Burrill & Company, a San Francisco-based merchant bank. The Fund manages \$150 million in committed capital. It invests in Malaysia-centric first-growth-stage life-science companies, wherever they may be based and wherever they operate.

The concept underlying the fund is to pursue “science without borders” through a process of open innovation. Open innovation is a strategic management concept, which Henry Chesbrough developed in his book of the same name. It entails the open and porous exchange of technology innovation and other knowledge between companies. It also entails the aggressive use of various modes and methods of facilitating technology transfer within a local business environment. Open innovation greatly reduces the transaction costs of technology transfer.

In the context of Malaysia’s emerging biotech sector, open innovation requires fundamental cultural change, particularly among private agribusiness companies that traditionally have been reluctant to share technologies in which they have invested. Embracing open innovation also entails investing in various institutional arrangements that reduce the transaction costs associated with transferring IP rights. Such collaboration-enabling investments include creating intellectual property rights (IP) that are well defined, secure and transferable in different forms, standardizing terms of material transfer

agreements (MTA's), standardizing licensing arrangements, working through interdisciplinary platforms encouraging inter-institutional collaboration, and forming specialized consultancies with expertise in market feasibility testing, environmental impact assessment and biological screening.

2.2 THE BUSINESS ENVIRONMENT

Malaysia's most recent (2010) industrial development plan, entitled "Economic Transformation Programme: A Roadmap for Malaysia," lays out an ambitious agricultural development program that includes four key elements: i) retaining Malaysia's competitive advantage in the industrial production of palm oil and rubber, which represent the core of the nation's agribusiness capacity; ii) transforming small-scale agricultural concerns into agribusinesses through supply chain integration, industrial process re-engineering, and superior food quality control; iii) moving from traditional low-value crops to high-value products and crops such as herbal products, edible bird's nests, seaweed and aquaculture; iv) increasing the technology-value-added content of food production by investing in genetic engineering and biotechnology. MLSCF primarily supports the fourth objective.

The plan specifically calls for facilitating foreign direct investment in biotech. To that end it proposes to "leverage existing bio-nexus initiatives and focus on areas such as plant nutrition and/or bio-yield enhancers, bio-pesticides, flavor enhancers, fragrances. Investments are proposed to be carried out through merger and acquisition, joint venture and the launch of new companies."¹ The plan designates a public-sector-owned Malaysian Biotech Corporation (MBTC) to lead this effort. However, as noted above, responsibility for MLSCF, which has parallel investment goals, is shared by the already established Malaysian Technology Development Corporation and Burrill & Company.

Both MTDC and MBTC have undertaken diverse activities over the past ten years, all designed to foster a high-tech agricultural sector in Malaysia. The launch of MLSCF is one of these activities. Other activities involve creating tax incentives for biotech investment, developing several research parks and biotech incubators, and strengthening ties between university and public-sector research programs. Unfortunately, these efforts have not been optimally aligned with each other.

Most of the agribusiness research and development is vertically integrated, proprietary and closed, the antithesis of the open innovation system described above. Parallel research is pursued by research laboratories under the Palm Oil Board, funded by an assessment on palm oil sales. The net result is research that includes redundancies, overlaps and a profusion of public and private sector initiatives that do not complement one another.

The protection of intellectual property rights is particularly important for the development of a cutting-edge biotech sector, as well as for the execution of MLSCF's mission. Malaysia is a signatory to the Patent Cooperation Treaty (PCT) under the World Trade Organization.

¹ Economic Transformation Programme, 2010, Government of Malaysia, Page 542, EEP 15: Agricultural Biotech

3 TYPE OF INCUBATOR AND MLSCF'S STRATEGIC VISION

3.1 STRATEGIC VISION, MISSION AND TARGETS

Over the past decade, breakthroughs in the life sciences have revolutionized agribusiness, pharmaceuticals and bio-energy. In all three of these areas, biological processes are replacing traditional chemical processes as sources of faster, cheaper, more precisely targeted production processes for a wide variety of products. These include food products designed notably for improved health, nutraceuticals, new genetically modified seed varieties, and new forms of pest and disease control.

MLSCF's vision is to accelerate the development of these trends in Malaysia. Its mantra is "Bio material plus information equals new industrial opportunity." MLSCF's mission is to build globally competitive life science companies that create some or all of their value in Malaysia. MLSCF uses two instruments in pursuing its goals: i) direct investments in zero- and first-stage biotech companies, and ii) investments through the Burrill Fund, which pursues biotech opportunities wherever they can be found. In this later investment mode, MLSCF operates as a fund of funds to open windows on new biotechnologies.

MLSCF's success can be measured in terms of the capital value appreciation realized by its portfolio, as well as by the rate of growth it helps to realize for Malaysia's biotech sector.

The concept of "Malaysian centricity" guides MLSCF's activities. Malaysian centricity in this context refers to companies which exhibit one or more of the following attributes: i) they are based in Malaysia; ii) they undertake commercial activities in Malaysia; iii) they have developed technology applications with strategic applications in Malaysia; or iv) they are prepared to undertake partnerships, technology licensing or other forms of technology transfer with Malaysian-based companies.

The venture capital fund offers the vision of a South East Asia that can supply its own food and its own energy. One such opportunity involves the productive use of forestry waste from palm oil production. MLSCF has invested in a company that has developed methods for converting palm oil biomass into sugars and starches that could be used to feed chickens. Another company has methods for converting the same biomass into isobutene, which can be used as a substitute for gasoline.

Companies active in Malaysia have already sequenced the palm oil genome and are testing various ways to enhance the ability of hybrid versions of the plant to capture increased energy from the sun and convert that energy into useful plant products. Indeed, three palm oil genome maps already exist in the public domain, and MLSCF companies are working to adapt and improve on these baselines.

The average yield from oil palms grown in Malaysia is 4.8 tons/ha. MLSCF aims to increase these yields to between 7 and 8 tons/ha by 2025, with less water uptake and with less release of methane into the atmosphere. What's more, MLSCF companies have developed enzymatic techniques that, if applied to naturally derived palm oil, should result in more healthful food products that enhance metabolic health, as well as create new, more valuable industrial feed stocks.

3.2 INCUBATOR'S DISTINCTIVE FEATURES

MLSCF's defining feature is its goal of translating knowledge into value for its investors. This value can be measured in two ways: the return on equity for investors and amount of technology transferred

into Malaysia. It is in combining and balancing these two objectives that MLSCF has become a pioneer.

MLSCF's dual mode of governance and control is also distinctive. The institutional set up under which MLSCF operates, with two yoked centers of control, has been tailored to fit its technology-transfer mission.

Technology investing poses unique risks and challenges. When it is done well, management methods applied in selecting investments, positioning them in the context of newly emerging markets for biotech products, mentoring management teams, nurturing best production methods and divesting companies can realize extraordinary rewards. However, the skills sets required for these activities are complex and difficult to learn outside the domain of actual venture capital operations.

The skill sets required to broker technology transactions that result in the transfer of technologies from companies based outside Malaysia to companies based inside Malaysia are equally complex. Transfers of growth-relevant technology can take place in various ways, for example, through company acquisitions, joint ventures and the direct acquisition of IP rights under royalty or other forms of risk-sharing agreements.

Another of MLSCF's distinctive features is its development of "receptor" companies in Malaysia that are able to adapt and profitably apply technology developed outside Malaysia. As they mature, these receptor companies are expected to act as gateways to facilitate further use and development of the technologies they import.

3.3 BRAND AND MARKET POSITION

Placing a value on an emerging biotech company involves some combination of art and science. It is a competence that is learned through principal involvement in active markets for venture capital such as the one in Northern California, which also is the primary home for biotech startups worldwide.

The biotech experience that Burrill has gained in the California market distinguishes the fund from competing venture capital funds based in Malaysia. MLSCF has been able to distinguish itself in this market by virtue of its superior deal flow, more advanced technology niches and the advanced technology status which its investment signifies for its portfolio companies, as well as its ability to cross-fertilize technologies, second-stage investment alternatives and strategic partners.

MLSCF also enjoys solid financial backing. Several state-owned enterprises have invested in MLSCF, including several public-employee retirement funds.

4 APPROACH TO INCUBATION

MLSCF provides strategic direction rather than tactical guidance to its invested companies. It leaves responsibility for tactical decision-making to individual company management. For example, MLSCF does not provide office or lab space for its invested companies, nor does it insist that companies in its portfolio coexist in a single location. Some of its companies do consolidate operations with other companies in efforts to realize economies of scope and scale. However, the fact that most of the companies operate outside of Malaysia make co-location impossible in most cases.

In addition, many of MLSCF'S companies have matured beyond the stage where they require incubation. Others have been started by entrepreneurs with prior biotech business experience, who would benefit little from incubator support.

MLSCF attempts to combine three types of knowledge in order to benefit its portfolio companies: i) knowledge concerning local market opportunities, ii) knowledge concerning emerging technologies and leading companies pursuing these technologies worldwide; and iii) knowledge of alternative local and international financing sources.

Knowledge concerning the Malaysian context comes to portfolio companies primarily through MTDC. The Burrill side of the management team offers a broader global perspective. Both elements are essential, however, for building world-class biotech companies, for bringing exceptional biotech innovations to Malaysian industry and for Malaysia to have an impact within its regional market.

MLSCF often assumes a lead role in the companies in which it invests. As a condition for its investment, it typically reserves the role of chairman for one of its officers or directors, and almost always appoints the chief financial officer.

4.1 SERVICES PROVIDED

The principals of MLSCF spend about 80 percent of their time advising CEOs of companies in their portfolio on issues including: i) assuring that the right management team is in place; ii) choosing CFOs who have the appropriate background and experience to help emerging companies lift off; iii) facilitating strategic linkages with other high tech companies that are working on parallel tracks or on closely related problems; iv) organizing company advisory boards so that the depth and quality of advice which companies require can be internalized within their own structure; v) transferring technologies in or out depending on the state of development and the strategic trajectory of specific companies; and vi) preparing companies for acquisition or market entry.

The kind of support the fund provides to its portfolio companies varies according to their needs and stage of development. For example, MLSCF sometimes undertakes zero-stage or startup investments. When it invests in startups, MLSCF provides mentoring and strategic advice with respect to organizational issues, technology directions, strategic partnerships and modes for protecting intellectual property. Biotech companies that fall into this category typically hold patents or other forms of intellectual property rights and have strong chief science officers. However, they frequently require help in finding chief financial officers or in setting up accounting systems that are sufficiently transparent to meet the fund's requirements and sufficiently user-friendly to help management make decisions.

The fund provides different kinds of strategic advice to more mature companies, for example to those seeking a second tranche of funding once they have successfully entered the market and begun to generate revenues. These companies typically need to consider second-tranche financing options that entail strategic affiliation with larger biotech companies, e.g. reverse mergers, as well as more traditional equity funding.

4.2 INCUBATION BUSINESS PROCESSES:

MLSCF approaches each investment opportunity with a thorough due-diligence review of the company's technology, its target market and its management team. The fund's selection process entails the following five steps:²

1. **Introduction:** The process begins with the introduction of an entrepreneur's idea. Introductions come from various sources, for example, from other entrepreneurs, industry leaders, service providers, other venture capital funds, or the fund's own contacts. Typically, the ideas of the enterprise's chief scientist initiate the investment process. The Malaysian biotech industry is still a small one and information about new technology ideas spreads quickly within it by word of mouth.
2. **Review Business Plan:** If MLSCF finds the underlying biotech idea worthwhile after reviewing the executive summary to the business plan, it will follow up with an initial meeting with the team. The objective of this meeting is to evaluate both the team and the opportunity. If the interview goes well, MLSCF management will read the entire business plan and critically assess its underlying assumptions.
3. **Due-Diligence Review:** If, after the business plan review, the business opportunity still remains attractive, MLSCF will follow up with a full-blown due-diligence review. The fund will do its own research. It will assess the market opportunity, often by talking with market experts. It will evaluate the product concept by discussing it with other scientists and/or technology experts. An important part of the due-diligence review will involve checking management references.
4. **In-depth Discussion:** Following successful completion of the due-diligence review process, MLSCF will invite the entrepreneurs to meet with its managing directors for an in-depth discussion. This represents a key tipping point in the process, where the fledgling company is valued, its capital requirements to reach its next growth stage determined and the VC's share of the company negotiated.
5. **Decision to Invest or Not to Invest:** MLSCF attempts to complete the investment review process quickly and to provide feedback along the way to the company's management team. If a decision is made to proceed, MLSCF will negotiate a final investment agreement, which includes the terms of stock ownership in the company and the residual obligations the management team needs to accept if they are to be funded.

4.3 INSTITUTIONAL FRAMEWORK

MLSCF is a private investment management company incorporated in Malaysia, which constitutes the general partner for its fund of biotech companies. The general partner is organized under the laws of Malaysia as a corporation. Burrill & Company owns shares in the general partner company in equal value with Malaysian Technology Development Corporation. The general partner is compensated based on a percent of the value of the portfolio under management, typically 2–2.5 percent.

MLSCF includes among its limited partners (investors) several government-backed institutions, which have made capital pledges to MLSCF and subsequently paid a significant portion of the capital contribution required for investments and MLSCF management fees. Calls are regularly made against

² These are the process steps described in the VC's web site: www.mlscf.com

limited partners in tranches of \$10 million as the fund requires additional replenishment. The fund's investors include Kazan, MetTey, P&B Mutual Funds and the Public Employees Prudential Fund.

5 BUSINESS MODEL

5.1 THE MLSCF BUSINESS MODEL

The MLSCF business model is modeled after the kinds of venture capital funds that have proved successful in launching the biotech industry in California. The biotech industry is knowledge-intensive and relies heavily on investment in research and development activities. Biotech products emerge from laboratories, not factories. In California, it is typically entrepreneurial scientists who launch new biotech companies by placing the intellectual property rights to technologies they have developed inside these companies. Venture capital has funded most of the biotech industry's growth in California.

Aspects of the California model have implications for MLSCF, among them:

- The fund's need to develop strong relationships with entrepreneurial scientists who are doing high quality, cutting edge research in Malaysia. It is these relationships which will determine to a large part the rate of deal flow from local companies which will support MLSCF's future growth.
- The VC's need to maintain strong working relationships with supplemental sources of funding which can replace VC equity in the multi-phased growth cycles of successful bio-tech companies. These sources, including other venture capital funds, government funding sources and commercial banks, are essential for sustaining the development of promising products and applications over the extended time required to bring new biotech products to market.
- MLSCF's need to build strong working relations with large agribusiness and pharmaceutical companies. These are equally important for assuring that opportunities for reverse mergers, technology transfers and other exit strategies remain open and available.
- MLSCF's need to invest in and encourage the growth of a dense ecosystem, which includes specialized service providers that can reduce time-to-market cycles and also increase the probability of successful development for companies in the VC's portfolio.

The typical economic life cycle for a new biotech venture indicates that as the company moves from concept to patented technology to product prototype and finally to market demonstration, the risks for investors decline and the value of the enterprise and its technology increase. Sustaining this full cycle typically requires patient capital and/or several serial sources of funding.

5.2 DEAL FLOW

MLSCF's deal flow primarily comes from four sources:

- Other venture capital (VC) firms. Much of the investing in the bio-tech venture capital world is done by syndicating with other VC. Once VC takes the lead in indemnifying and qualifying

specific investment opportunities and then shares risks with other VC partners in providing funding.

- Direct contacts between star scientists and MLSCF principals. The reputation of VC principals attracts entrepreneurial scientists in the same way that magnets draw iron filings. The technical and business reputation of Burrill's partners is strong both in Malaysia and the US. Consequently new biotechnology companies are drawn to them.
- Word of mouth and the visibility that comes from speaking in public and participating actively in industry networks.
- Referrals from government-sponsored institutions that are involved in biotech incubation, support of basic research and biotech venture capital.

5.3 STAFFING

Most of MLSCF's staff include senior principals in either Burrill or MTDC who are senior enough to serve as chairmen or board members of the companies in which the fund is invested. The fund has five of these principals, none of them full-time.

In addition, MLSCF supports a small staff of three financial and technical analysts, who are based in Malaysia. Part of the training of this staff entails periodic practicum in venture capital management and valuation which take place in Burrill's San Francisco office. These company analysts have an opportunity to learn from and to interact with other more experienced analysts.

5.4 NETWORK PARTNERS

MLSCF has developed two sets of network partners, one within Malaysia and one outside Malaysia. MLSCF's inside partners include government agencies that are active in biotechnology, biotech companies, universities and technical centers.

Since it was established in 2005, the Malaysian Biotechnology Corporation, or BiotechCorp, has become the lead development agency for the biotech industry in Malaysia. It provides support, facilitates biotech company network development and provides advisory services for fledgling biotech companies. To date, BiotechCorp has facilitated the development of 158 BioNexus-status companies. These BioNexus-status companies qualify for the fiscal incentives, grants and guarantees which BiotechCorp manages. The MLSCF interacts extensively with Biotech Corp through various conferences, joint committee assignments and common board memberships.

MLSCF's outside network includes the biotech companies in which it has invested that are located outside the country. Importantly, MLSCF also acts as a kind of international ambassador from Malaysia to the global biotech industry. Under MLSCF's auspices, some of the leading figures in this area including Dr. Stephen Summut from the University of Pennsylvania's Wharton School, as well as other biotech experts from Washington University, the University of California and leading California-based biotech firms are frequent visitors to Malaysia and advisors to biotech companies based in the country.

6 OUTCOMES AND RESULTS ACHIEVED

To date, the fund has invested directly in 12 companies. Since the fund's start, none has failed, two have been listed on public exchanges and one is a potential acquisition target for a much larger corporation. However, only two of the 12 companies are based in Malaysia. MLSCF's has invested indirectly in 26 additional companies through Burrell. Of these, one company has been bought back by its management and two others have been sold to larger corporations. None have failed.

The open innovation rationale underlying indirect investing is similar to the one behind direct investing: That is, indirect investing opens a window on emerging technologies, new products, new processes and new emergent markets. It also opens access to the management teams of emerging companies through which technologies can be transferred to Malaysian-based companies. Benefits in this area are intangible and difficult to measure.

7 FUTURE GOALS

Biotech development is fraught with risks, and multiple institutional responses are required to address these multiple risks. In order to assure that the biotech development proceeds as smoothly as possible and with a little residual risk as possible, different forms of support need to be made available during different phases of enterprise development. To this end, it would be preferable to have three sets of investment institutions work back-to-back in the sector in lieu of the single one, MLSCF, which currently operates there.

Such an arrangement would include the support of an angel investment fund to support zero-stage start-ups; a venture capital fund organized much as MLSCF is, which would support first stage companies; and a private-equity fund for more mature investments that are market-ready. Each tiered investment institution would be organized to assume progressively diminished risk, and would correspondingly expect to receive a correspondingly lesser return on investment.

8 CRITICAL SUCCESS FACTORS

The arrangement being tested and refined in Malaysia appears to have relevance to other middle-income agricultural countries, including Chile, Thailand, Indonesia, South Africa and Brazil. However, a number of preconditions or critical success factors must exist. One of these is a hierarchical structure of enterprise financial support, which provides serial financing stages for biotech companies as they mature and which recognizes risk/return tradeoffs at each distinct equity financing/risk management stage. Angel investors are needed to support this structure at one end and large agribusinesses that can usefully adopt new technologies are needed at the opposite end.

In addition, a culture of risk-taking needs to be developed. Early biotech investing is inherently high-risk and investing early in the product/enterprise development cycle should entitle outside investors to correspondingly high returns and entrepreneurs to a second, third or fourth opportunity to start a successful tech business.

In particular, an a priori investment culture needs to be developed that is less risk-averse than those traditionally prevailing in commodity-producing agricultural economies. Failing that, focused attempts to create a cutting-edge biotech sector are almost certain to collapse into the development instead of a quasi-technical service sector. Biotechnology development typically entails long investment cycles, multiple clinical trials and uncertain results, which may or may not prove to be useful, marketable or affordable. Zero- and even first-stage enterprises that produce cutting-edge biotech development begin operations without sales revenue in markets which they have not tested.

A final factor that can greatly mitigate risk is the willingness of agribusiness companies that operate either upstream or downstream of entrepreneurial biotech enterprises to provide exit options to biotech investors and support buyout options for biotech companies when they reach critical maturity. As noted above, this kind of development has not yet taken place among Malaysia's larger agribusinesses.

9 LESSONS LEARNED AND IMPLICATIONS FOR AGRIBUSINESS INCUBATORS

Many developing countries find themselves at a critical balancing point between their available supplies of food and a growing population with a corresponding growing demand for food. The most important point to be taken away from this case study is simply this: Biotechnologies are developing that offer the dual prospect of both improving food security and of enhancing the competitiveness and/or productivity of commercial agriculture in developing countries. Linking biotechnologies to established food systems is difficult and risky. As noted in the section above, several structural, institutional and business culture preconditions may exist, of which developing countries need to be mindful. With that said, the need to feed growing populations would appear to more than justify taking significant risks and making changes to ensure that necessary preconditions are in place to support biotech investment.

If the food systems in developing countries are to continue to grow their supply capabilities to keep up with growing populations, institutional means need to be found to make new biotechnologies commercially available to the more dynamic elements of agricultural economies, which are driving commercial farming.

The "open innovation" approach being tried in Malaysia and the biotechnology transfer efforts which MLSCF has undertaken offer one potential way to integrate commercial agriculture with cutting-edge biotechnology. However, more important than any specific institutional approach are a vision for what modern life sciences can offer and the political will to engage cutting-edge bioscience in ways to overcome the exhaustion of traditional agricultural resources.

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