

Mindset barriers hindering the development of Malaysian agriculture

Mohd. Murray Hunter

Northern Malaysian University College of Engineering (KUKUM)

Abstract

Under RMK9, the development of the agriculture sector is a high priority to assist in national development. The ambition of the Government is to transform agriculture into the third major driver for the economy, which will assist in the eradication of poverty and act as a catalyst in the development of a biotechnology sector. Historically, Malaysia has been very successful in the estate sector, with palm oil, rubber and to a lesser degree cocoa. These sectors were developed with vision and foresight, all being introduced crops to the country. However small-holder involvement in the agricultural sector has lagged behind. If the objectives of RMK 9 are going to be achieved, it is the small-holder sector that must meet the challenge.

Farmers and small-holders have access to physical resources such as land. Other resources like finance, technology, knowledge and market information are necessary to develop successful agro ventures. A critical ingredient in success is mindset. However the current beliefs in the agricultural sector is a major barrier hindering development. Farmers and Small-holders reluctant to seek their own markets and business linkages, reluctant to embrace 'global' trends like sustainable and organic agriculture, and unsure about introducing new crops, of which they have no experience. Agricultural managers in the country tend to perceive palm oil production as the standard or 'benchmark', when evaluating new crops. A '*knowledge trap*' mentality and over optimism by policy implementers is also hindering development. This paper will explore these issues and discuss education and training in the agriculture sector in the light of the above issues.

Introduction: Policy Aims and Objectives

The Prime Minister, YAB Dato' Seri Abdullah Haji Ahmad Badawi has given strong personal support to the *Ninth Malaysia Plan*. The plan has a major objective of revitalizing the agricultural sector to become the third pillar of growth in the economy¹. Although projections of the agriculture sector's percentage of GDP is still expected to decline over the next five years, from 8.2% in 2005 to a forecast 7.8% in 2010, real GDP is expected to increase from RM21,585 million in 2005 to RM27,518 million in 2010. A real growth rate of 5.0% p.a. is required to achieve this².

This objective is expected to be achieved through increasing Government expenditure in this sector from RM7,749 million or 4.6% of total Government expenditure during the Eighth Malaysia Plan to RM11,435 million or 5.7% of total Government expenditure during the current plan³.

The vision for agriculture under the Ninth Malaysia Plan is to transform the sector into a technology and skills based sector, relying on estate sector expansion, research and development and entrepreneurship to improve productivity and increase efficiencies. The Government will attempt to facilitate this through investing in infrastructure development, human resource development and increasing funding for research in the sector⁴. Through this approach, new sources of growth are expected to be exploited, agro-based processing expanded with diversified products, new global markets developed, thus increasing the incomes of entrepreneurs, farmers and small-holders⁵. The policy recognizes that there are still pockets of poverty in rural areas and a slow transformation of small-holdings into modern farms⁶. The Ninth Malaysia Plan is very specifically focused on the above issue, when compared to the Third National Agricultural Policy (NAP3) 1998-2010⁷, reflecting the changes in thinking from the late 1990's, when that document was written.

The most crucial part of the Ninth Malaysian Plan agriculture policy is in the area of human capital development. The overall macro-economic objective is to increase productivity by 6.2%⁸. The policy specifically focuses on "*emphasis will be given to the provision of training to change the mindset and*

*attitudes of farmers and fishermen as well as the younger generation including those with higher education to participate more effectively in modern and commercially orientated agricultural activities*⁹. Not only is this measure intended to improve productivity, but assist in creating job opportunities for those unemployed in rural areas, a source of poverty in Malaysia. The plan to train 657,720 people over the next five years shows the immense size of this initiative and priority of the Government. Under these programs, small and medium size entrepreneur ventures are specifically targeted as a major component¹⁰.

Some Issues Related to the Agriculture Sector

Even though the agriculture sector has achieved steady growth, there are still a number of challenges in the decade ahead. Many opportunities also exist. In the limited space available, I will highlight some of these issues and opportunities.

1. The Dependence on a Few Crops and Product Differentiation

The agricultural economy is currently commodity based and dominated by a few major crops, which history has shown are volatile to cyclic swings in world prices. Table 1 shows the break up of major crops in land use and value¹¹.

Table 1: Agriculture Land Use, Overall Value & Growth			
Crop/Activity	Land Use (%)	Overall Value (%)	Growth (%)
Palm Oil	29.29	34.40	5.5
Rubber	44.00	6.70	(1.4)
Cocoa	3.29	5.90	(4.6)
Rice/Paddy	11.6	3.50	0.2
Livestock	0.6	7.60	?
Coconut	4.33	1.69	(2.9)
Fruits	4.50	8.60	5.6
Fisheries/Aquaculture	N/A	14.40	?
Misc. Crops/Activities*	2.40	17.21	1.2

*Includes mixed horticulture, shifting cultivation, sugar, pepper, vegetables, tobacco.

This situation indicates the need for increases in productivity in some sub-sectors, notably rubber, rice paddy and coconuts. There is also a general need for new crop diversification, thus a requirement for research and skills development.

2. Competitive Advantage

Generally, the highest income returns from agriculture in Malaysia range between RM4-7k per hectare, with high input bases. The tables below show current establishment and input costs for palm oil, cocoa and rubber¹².

Table 2: Approximate Costs of Plantation Development for Palm Oil, Rubber & Cocoa

Crop	Land Costs RM per Ha.	RM Costs to Maturity per Ha.	RM Total Costs	No. of Years to first harvest
Palm Oil	3000+	6500	9500+	2-3
Rubber	3000+	14000	17000+	5-7
Cocoa	3000+	N/A	N/A	2-3

Table 3: Approximate Cultivation, Harvesting and Handling Costs for Palm Oil, Rubber & Cocoa.

	Palm Oil RM/Ha.	Rubber RM/Ha.	Cocoa RM/Ha.
Fertiliser Costs	702	134	541
Other Upkeep Costs	252	281	893
Total Upkeep Costs	954	415	1434
Collection Costs	721	2046	901
General Charges	479	608	969
Manufacturing & Despatch	217	67	320
Total Costs	2371	3135	3624

The relatively high establishment and cultivation cost in the commodity sector, leaves it open to fierce competition from lower resource and input cost economies in other tropical countries. This is a dangerous situation in commodity based industries, as there are little opportunities for product differentiation between the same products produced in different countries, unless there are distinct quality variances. The rubber industry has been drastically affected by cheaper production in Indonesia and Thailand, and superior quality of cocoa produced in West Africa has partly affected the cocoa industry, here in Malaysia. Prices of plant oil substitutes and synthetic rubber also affect the industry. This is not just confined to the major commodities, sugar production in Kedah and Perlis will be under great competitive threat once AFTA is activated.

This situation indicates the need for cost reductions based on more efficient maintenance regimes, which again requires research, skills development, new crop diversification and the development of competitive advantage through product differentiation, requiring innovation and new product development.

3. Failure of R&D to play a role in maintaining competitive advantage

Malaysia has slipped from being the number one producer of rubber to number eight over the last twenty years. Research and development during this period didn't solve yield and input issues, and assist the country maintain its dominant position in the world market. Little was undertaken in germ-plasm development and eliminating labour intensive methods of collecting rubber. Research didn't halt the decline of the cocoa industry, where pest and disease resistant clones failed to materialise from various breeding programs.

Long periods of low commodity prices did not encourage improvements in production efficiency and productivity for these commodities, except for the palm oil industry.

The palm oil industry has developed many innovations to improve production, the implementation of precision farming, the recycling waste into mulch, fertiliser and fuel. However, increases in aggregate production has not come from productivity improvements, rather this has been left to area expansion.

Chew outlined what actions were needed at the FAO conference in Rome 2003 to turn around the stagnation of productivity and efficiency. These are, improvements in processing methods, the need to improve staff and labour quality, the need to increase the effectiveness of R&D and extension services and the need to develop more added value products¹³.

4. The Smallholder Sector

The smallholder sector in Malaysia produces the bulk of the country's cash crops and their contribution to food production is significant. However, most smallholders suffer from uneconomic land sizes, exposure to commodity price fluctuations, rising input and production costs, shortages of labour, soil erosion, and persistent low productivity. There is also a high degree of monoculture in this sector and this is stressing soils. Together with many poor farming practices, the bulk of the smallholder sector is unsustainable, where high levels of phosphates, pesticide and herbicide residuals are finding their way into waterways and the water-table itself. This group is among one of the lowest income groups in the country.

In addition, the children of smallholder families, given the opportunity, are attracted to other careers outside farming, as they see this as a way out of poverty. This compounds labour shortages and starves the sector of good management and entrepreneurship. Thus the sector is left with an aging labour population. Also, good agricultural land near cities and towns is now worth more for other uses and many succumb to the temptation to sell their land.

The smallholder sector generally has a very low technology base. There has also been a large failure in successfully implementing new crops into the sector. Research institutions like MARDI follow only national *new crop* agendas, so regional *new crop* development is left to the various state agriculture departments, most having extremely limited resources for research, development and extension. There are a number of steps required to successfully implement a new crop, which needs technical, management, entrepreneurship skills and finance. Financial institutions are extremely reluctant to advance funding for new crops and technology development. Smallholders have traditionally only been interested in cultivating crops for other people to market and sell, thus missing more profitable parts of the value chain.

Table 4. Issues and problems Encountered in New Crop Development¹⁴

Issue	Comments
Focus Paradigm	<ul style="list-style-type: none"> • Requires focus on concept of food where present focus is on cultivation • This requires research • This requires entrepreneurship approach • Concepts not understood by farmers
Basic Research	<ul style="list-style-type: none"> • Needs access to worldwide data • Requires availability of suitable germ-plasmas • Requires basic R&D to determine whether crop technically suitable • Requires basic R&D to determine if potential crop is economically feasible
Crop Management & Processing	<ul style="list-style-type: none"> • Propagation technologies • How to plant, cultivate & manage to crop • How to harvest, extract, store and handle • How to process • How to package • Transportation and storage
Marketing Infrastructure	<ul style="list-style-type: none"> • Require coordination of production with demand • Require correct channels of distribution • Requires a marketing strategy
Economies and Logistics	<ul style="list-style-type: none"> • Requires enough volume to economically transport and distribute • Requires solution to inconsistencies of quality and production
Organisation	<ul style="list-style-type: none"> • Need committed people with strong leadership and trust
Government	<ul style="list-style-type: none"> • Need to translate support into action • Need funding allocations
Finance	<ul style="list-style-type: none"> • Very difficult to obtain funding for these projects
Consumers	<ul style="list-style-type: none"> • Need efforts for education & promotion

In the smallholder sector, there are immense opportunities for development. Currently, there is a RM 7 Billion trade deficit in food imports¹⁵, and this is likely to blow out even further in the next decade. However, to take advantage of this opportunity, there is a need to reduce labour requirements through mechanisation, automation and the introduction of new technologies. Precision farming has a role to play in controlling inputs¹⁶ and monitoring yields, as it has been successfully applied to the production of mushrooms and poultry. Strategies can be developed for the development of sustainable farming through waste recycling, integrated pest management (IPM) and organic farming. Finally, entrepreneurship and integrated farming system models utilising new technologies need be developed for implementation at the farm level and new crops developed that match consumers changing tastes.

5. The Fruit Sector

The fruit sector is primarily controlled by smallholders. This can be divided into two groups, the subsistence smallholder discussed above and small to medium plantations usually owned and managed by family groups. Some of the larger estate companies have also moved into these crops over recent years. A number of value added products can be processed from fruits such as fruit juice concentrate, dehydrated/powdered fruit juice, fruit puree and fruit nectar. Frozen fruit juice concentrate is a major international commodity, which is bought and sold in the hundreds of tonnes. Globally, as well with local consumer tastes, there are rapidly changing preferences for tropical blends and ‘exotic’ fruit juice drinks and beverages. Opportunities exist for the development of a concentrated fruit juice industry to cater for these emerging ‘niche’ and ‘boutique’ markets.

Existing processes in other countries to produce concentrated fruit juices have been criticised for being unpasteurised, highly inefficient in production in terms of energy consumption, lacking in vitamins and enzymes, containing gelatine, and reports of some manufacturing companies having dismal human rights records in South America where the majority of fruit juice concentrates originate¹⁷. Opportunities also exist for improved bioprocesses to produce concentrated fruit juices on a global basis.

6. Organic and sustainable farming

“Organic farming management relies on developing biological diversity in the field to disrupt habitat for pest organisms, and the purposeful maintenance and replenishment of soil fertility. Organic farmers are not allowed to use synthetic pesticides or fertilizers. Some of the essential characteristics of organic systems include: design and implementation of an “organic system plan” that describes the practices used in producing crops and livestock products; a detailed recordkeeping system that tracks all products from the field to point of sale; and maintenance of buffer zones to prevent inadvertent contamination from adjacent conventional fields¹⁸”.

Organic farming takes a holistic approach to all issues, with an objective of achieving economic, social and environmental sustainability. A comparison between traditional industrial and biological models of agriculture can be seen in Table 8 below¹⁹:

Table 5: Comparison of the Industrial and Biological Models of Agriculture	
Industrial Model	Biological Model
Energy Intensive	Information Intensive
Linear Process	Cyclical Processes
Farm as a Factory	Farm as an Ecosystem
Enterprise Separation	Enterprise Integration
Single Enterprise	Many Enterprises
Monoculture	Diversity of Plants and Animals
Low-Value Products	Higher Value Products
Single Use Equipment	Multiple Use Equipment
Passive Marketing	Active Marketing

Organic farming is not just a trend, *“Organic farming is practiced in approximately 100 countries throughout the world, with more than 24 million hectares (59 million acres) now under organic management. Australia leads with approximately 10 million hectares (24.6 million acres), followed by Argentina, with approximately 3 million hectares (7.4 million acres); both have extensive grazing land. Latin America has approximately 5.8 million hectares (14.3 million acres) under organic management, Europe has more than 5.5 million hectares (13.5 million acres), and North America has nearly 1.5 million hectares (3.7 million acres²⁰)”.*

Organic farming has shown an increase of 20% per annum over the last decade and now approximately 2% of the U.S. food supply is grown using organic methods²¹. The global market for organic food and drink reached \$23 billion in 2002²².

Changing lifestyles and affluence, together with consumer education and food safety concerns are a strong awareness and slowly increasing demand for organic foods in Malaysia. However this is limited to a few of the major cities like Penang, Kuala Lumpur and Johor Bahru. There is good reason to believe that Malaysia will follow Thailand, Singapore and Western countries in developing significant markets. Major hyper and supermarkets in Kuala Lumpur, Johor and Penang already devote a special section for organic products.

The organic production base in Malaysia is extremely low as the table below demonstrates²³. The integrated and sustainable nature of organic farming models has the potential to create many innovative downstream activities, due to focus on the whole supply chain. This includes the production of organic foods for supply to supermarkets throughout the country. If the “organic” market takes hold in Malaysia similar to trends around the rest of the world, integrated farming, considered a weakness of Malaysian Agriculture by many experts²⁴ can be developed to greatly assist in poverty eradication in rural areas.

Table 6. Organically Certified Farms in Malaysia as at 2001 & 2002

State	Number of Organic Farms	Size in Hectares (2001)	Number of Organic Farms (2002) ²⁵
Perak			3
Selangor	4	10.8	4
Negeri Sembilan	10	90.0	164
Melaka	2	1.1	0
Johor	2	4.0	128
Pahang	6	11.6	221
Kelantan			41
Sabah	2	12.0	12
Sarawak	1	2.0	8
Total	27	131.5	581

7. The Food Processing Sector

The food processing sector can be divided into two sub-sectors; large scale industries, that are multi product conglomerates like *Nestle*, *Unilever*, *Cadbury* and *Dutch Milk* and a very fragmented sub-sector made up of small to medium scale companies, mostly locally owned and managed.

The multinational companies are well organised and managed, using the latest updated imported technology. The multinational companies dominate their market segments in processed foods, beverages and dairy products. These companies have extremely strong bargaining power over the retail sector in Malaysia, large advertising and promotion budgets and strong field sales and merchandising forces.

On the other hand, local SMEs are faced with many obstacles, poor management, single product companies, weak distribution networks, no bargaining power with the retail sector, no field representation, no advertising and promotion budgets, a very low technology base, lack access to finance, manufacture products manually, lack any R&D or quality control systems, have trouble purchasing raw materials, lack storage and handling expertise, have no access to market data, and lack skilled workers. 10,000 companies or 93% of this sub-sector can be considered cottage industry²⁶.

Opportunities to develop this sector are many;

a) Product Development as an innovative discipline is needed to develop new products, processed foods, fast foods, health foods, organic foods, local foods, international foods, beverages and dairy foods. There is a need to modify local cuisine to develop low fat or fat free, cholesterol free and oil free local foods to assist in fighting increasing obesity, health problems and diabetes. Research also needs to be undertaken on shelf-life, transport and storage and food safety issues.

b) Process Development: New food processing technologies need to be developed to reduce the reliance on labour intensive processes in production and improve product uniformity, quality and safety.

c) Packaging: New forms of packaging concepts are required to assist in the storage, transport and handling of food products and for marketing ascetics. Consumer expectations need to be met with new innovations, for example biodegradable packaging, longer shelf-life and comprehensive labeling.

d) Supply Chain Management: Agriculture development must be matched with supply chain management, as there must be new processes for storage, handling and transport of foods. Success of new biotechnology will also depend on the development of; Consumer education for processed food, Low price elasticity for processed foods, Need for better food distribution network, Backward/forward integration from farm to consumer, Development of marketing channels, Development of linkage between government, industry, institutions and consumers, and review of food laws

e) Management Expertise; Managers and entrepreneurs need to be trained to see the market strategically, their company's position in the marketplace, how to develop strategies to make them more competitive and understand the value of new technology to their respective enterprises.

8. Halal Food

Malaysia is primarily an Islamic country in a fundamentally Islamic region. The demand for halal food is rapidly rising around the world and there is opportunity to develop Malaysia into a *halal food hub*. Malaysia has one of the most respected certification systems for halal food in the world and research must be invested into supporting this position, if Malaysia seeks to realise its ambitions. Local and imported halal foods must be continually scrutinised to maintain confidence and transparency. This is needed to ensure that there are no scandals about food ingredients, which was the case with the use of banned food colours in local foods by a small group of manufacturers a few years ago. One manufacturer claiming a product is halal when it isn't, could ruin Malaysia's reputation as a leading producer in the world of halal food for many years. Halal research needs to be expanded to find new methods of halal determination.

Discussion

Failure to solve the many issues and exploit opportunities mentioned above, the author believes, have a basis in a socio-psycho 'mindset' prevailing in the country. This is not to say that a change in mindset is the only factor that would result in solving problems and exploiting opportunities. Infrastructure, education, skills development, market scanning, new crop and processing development and last but not least, financial support are all factors, just as important to make change. However without mindset change, the allocation of resources into all the other areas is not likely to change the nature of the agriculture sector.

The writer's observation of this prevailing mindset is not discriminating through the various participation levels in the sector, as can be shown in the following examples;

1. Farmers and small-holders tend to produce first without buyers, rather than go out and look for customers, *market passive*,
2. If one farmer is successful in cultivating a particular crop and has a 'niche' market, many others will want to join the bandwagon until over supply occurs, *copy cat approach*,
3. Farmers and small-holders have for generations used the '*quick-fix approach*' to agricultural practices and problems, i.e., heavy use of herbicides, pesticides and burning off to rid the land of

- weeds, pests and wastes, and have little understanding of the concept and value of sustainable farming, *poor exposure and perhaps resistance to new ideas*,
4. Mono-cropping is widely practiced, rather than integrated approaches, *practice isolation*,
 5. Considered potential crop options are usually within a narrow list of traditional crops, *market isolation*, and finally
 6. People only undertake agriculture activities, if they cannot get a better job somewhere else, *perception of agriculture as only a fallback profession*.

In addition, management (both public & private sector) tends to compare all potential new crops with palm oil revenues, i.e., 'benchmarking' in evaluating economic and cultivation potential, *fixation on a single success*.

Another common phenomenon is what was termed as the '*knowledge trap*' by Professor Hans-Dieter Evers of the University of Bonn. The knowledge trap process begins when data, knowledge and information is taken over without understanding of the corresponding local and site specific issues involved and this data becomes the basis to copy solutions into the local context. The transfer of knowledge without testing and localisation can lead to poor investments and project failure as the gap in the information left unknowns unresolved²⁷. It is too common that local decision makers fall into this trap.

Psychologically, this can be seen as a manifestation of overconfidence, which can in extreme cases perpetuate an air of arrogance and close one's mind to bad news and signs of failure in the pursued development strategy²⁸. This is a much wider phenomenon and can be seen almost universally in management around the world²⁹. Overconfidence is a facet of a more general optimism bias, making one believe in their own judgements, even though data supporting these views is not present. General behaviour arising from this is taking actions in situations where information and advice to the contrary is provided by others and ignored³⁰.

Finally on this point, this behaviour tends to be supported by the metaphoric idiom as '*berlagak pandai*' or showing off a pseudo-knowledgeable behaviour, that may not have its basis in fact or proven data. This is perhaps a culture specific behaviour which has something to do with '*being honest*' is not preferable, if honesty reveals one's lack of knowledge or ignorance. This can be summed up as a dysfunctional cultural trait, as the idiom '*sekan bertanya sesat jalan*' or if we feel shy to ask, then we may go unguided indicates³¹.

There are a lot of reasons for this, which is outside the scope of this paper and in the scope of ethnography and cultural anthropology. What is important in this discussion is that the above mould of thinking needs to be broken out of for any chance of the policies in the Ninth Malaysia Plan to be successful. The next question is, how can this be done?

Changing the mindset of a whole industry sector, is certainly much easier said than done. The top people in Government have realized this mindset needs to change, they have led the way in rhetoric and currently backing up the commentaries with the programs they promised. The Prime Minister YAB Dato' Seri Abdullah Haji Ahmad Badawi has been stressing this point at every opportunity³². However, the problem is in the grassroots and the deliverers of the policy, and that is the challenge. The mindset is entrenched in the culture, informally reinforced by the bureaucracy, and the resulting attitudes and behaviour of the general population is the outcome

The priority issue is to impart new values into the trainers who will train and educate farmers and smallholders around the nation. The task of training 657,720 people over five years in new agricultural techniques, practices and in new crops, markets and strategies, putting infrastructure aside, is going to take in-excess of 1800 new or existing trainers^a. Although resources have already been partly allocated to existing educational institutions, there is still an uncertainty as to which direction to proceed in terms of the curriculum of the training programs. It is also likely that some new institutions will also be developed for this purpose. Nevertheless, all of these trainers will have to be comprehensively trained or retrained in new

^a Based on a trainer to student ratio of 1:18 for 3 month intensive courses.

techniques, knowledge about new crops and market strategies, so this can be passed onto smallholders and entrepreneurs. Finding enough experienced and qualified people, within existing and for new institutions, preparing the courses with local and region specific information is going to be another challenge.

This plan will have to be backed up with a national resource database that can provide trainers, students and the general community with crop, processing, farming practice and market information about a large number of new crops. A team would need to be set up and compile this information and then develop strategies to disseminate this information to all communities in the nation. The database would be the link that connects the farmers, trainers, schools and nation with the world, which would support the localized courses, so they can focus on relevant new opportunities in agriculture, rather than rely on traditional crops and methods of agricultural practice. Ideally, the database should become a pool of ideas, opportunities and strategies for various groups to explore in their own local contexts. Then once receiving the knowledge component, smallholders would be in a better position to exploit these opportunities. This is another challenging job to be undertaken and will require a number of agronomic, engineering and marketing experts, with both local and extensive international knowledge.

In these courses, marketing has to be a major component, focusing on new strategies to empower farmers and small-holders, that are practical and workable at micro level. This is also a challenging task, but some lessons could be learned from Thailand with their “One Tambon, One Product” program, which has been very successful. In the Thai experience, networks, channels of distribution and market contacts seem to be a more important factor in success than competitive advantage³³. Many market issues have to be solved with emphasis on how to identify and penetrate new markets, for example, *how do we develop organic farming on a local and national level, when today in Malaysia only a very small percentage of the population recognizes the value of organic produce, while the rest will be unwilling to pay the premium?* Even though these issues are complex, many opportunities exist; as an example nut crops, new fruit, new vegetables that urban populations will accept, due to growing urban affluence, changing attitudes to food and lifestyles. Opportunities can be discovered by studying the incongruities³⁴ between Malaysian agriculture production and supply, represented by the national annual food import bill, the nation has to fork out of foreign exchange each year. Innovation in production and market is necessary to achieve these objectives and this mindset, must be developed at the grassroots in the farmers and smallholders themselves. If this can be achieved even with a small number of people, new crops, product development, processing, packaging and branding will slowly evolve from the rural areas and most importantly, agriculture will become to be thought of a worthy business enterprise.

This is where the development of an entrepreneurial approach to farming may once again become attractive to graduates. It is a matter of changing the paradigm from ‘working for very little under the hot sun’ to becoming a business person serving the needs of identified customers. In this new paradigm, farming may once again become a realistic choice for the graduates. Through paradigm change and the corresponding mindset, a farm becomes a business like any other business that serves the needs of its customers, a very basic management theory that must be accepted and practiced.

The economic size of land and sustainability of farming is another issue that will require both structural and mindset changes to build small enterprises into feasible and economic organizations. This cannot be done in individual isolation and an important role of the agricultural training programs will have to be in grouping farmers and small-holders together in common enterprises or co-operatives. Co-operatives work in most countries and if this organizational entity can be rediscovered for the potential it really has to re-structure and strengthen agriculture, there can be rapid progression. Again, this is a mindset issue as there are no changes or increases in physical assets, only reorganization of what is already there.

To enhance the probability of the above scenario succeeding, national crop agendas and objectives have to be more localized. Currently MARDI is responsible for most of the national agenda research, so other agricultural institutions and local universities must fill the vacuum and undertake locally biased research on new crops, processes and practices, downstream and market development. There is a major role these institutions have to play.

Finally, the issue of capital and financing has to be seriously addressed. It isn't easy for farmers and small-holders to get access to financial resources. The Government has pledged that this issue will change and if this can be achieved, ideas can be converted into enterprises. The redevelopment of co-operatives would be a legal entity that would make the provision of loans easier. Institutions like Bank Pertanian (BPM) and the Credit Guarantee Corporation (CGC) must play their role here. The use of mentoring and extension after students have graduated conducted jointly by the training institutions and bank, could strengthen the process.

Conclusion

The Ninth Malaysia Plan documents have good intentions and it is my observation that there is a very concerted effort this time round to make things happen on the ground. *Turning things round* however is easier said than done because the delivery system is under stress due to the shortage of qualified people. But this can have a positive side, because in the end, it is the individual responsibility and not the state's prime responsibility to develop new enterprises. The state provides the environment and support infrastructure. This however does not negate the importance of a positive nexus between state-community and individual in agricultural development and RM9 in its holistic nature is seeking to achieve this.

The responsibility for change lies in the individual rather than the institutionalized support network for farmers. National research institutions like MARDI undertake research and development based on the national agenda. The funding procedures reinforce this. State Departments of Agriculture generally lack the funds, personnel and as a consequence, the strategic foresight to look deeply into crop diversity, downstream processing and alternative markets and channels for new crops and value added products. Institutions of higher learning are themselves undergoing a change from inward 'ad hoc' research to realizing the need to develop research output that will benefit the community at large. There are still a lot of barriers to developing university-industry collaborations due to attitudes on both sides that need change. Thus mindset change has to be driven by the entrepreneurs themselves and research institutions follow the opportunities created by the private sector.

Education, training and skill development needs to be made accessible to all that require it. This means developing vocational institutions that are centres of community learning and development. These institutions must be both practical in outlook and experimental with new crops and practices, so that region specific ideas, techniques, crops and processes are developed. The institutions have to have a marketing base, as all venture development starts with the market. Staffing these institutions is going to be difficult, as there is a dire shortage of qualified practical, experienced, open to new ideas. Trainers must not just have the ability to teach and pass on knowledge, but inspire at the same time. Before these grass-root institutions can be effective, a national program must be in place to '*train the trainers*' so they can go out and preach mindset change and become community mentors. The models in other countries are there to emulate, the TAFE system in Australia, the Indian agricultural institutes and the Thai agricultural colleges.

Practices, techniques have to change, attitudes have to be changed and this is where the power of the media and state can be used positively along with current infrastructure like *Kemas* to push the point to the community. Hopefully, community awareness of opportunities will slowly develop to eventually mold a supportive culture for the entrepreneur. If the community becomes more aware of new agricultural practices, new crops and the necessity to be involved in the market and perceives this a necessary prerequisite for empowerment, a large barrier to mindset change will be overcome.

Finally, it is necessary, if not paramount to making positive steps, is to kindle passion, determination and persistence in entrepreneurs. Passion, determination and persistence, coupled with the right cognitive perceptions about the strategic environment, knowledge, skills and resources to implement the vision is an almost unbeatable combination in seeing a project through to success. This is required both at the individual and institutional levels. This is the greatest challenge to the nation's agricultural sector, a very intangible set of qualities that are difficult to create inside a person, but with the absence of passion, persistence and determination, the barriers and difficulties along the way will appear to the insurmountable to the entrepreneur. Without passion, determination and persistence people will be quickly discouraged, faced with the complexity of new demands in creating a venture without a reference to follow, absence of

knowledge and immediate answers, required learning and the unexpected problems that will emerge along the road to developing a more holistic agro-based venture. Passion, determination and persistence is an entrepreneur's key source of strength to contend with adversity³⁵. These attributes are required to support the entrepreneur see through the project until positive results and success prove that their actions are correct. A number of success stories at the SME level in various regional areas are needed to boost confidence and build a positive psychological momentum. More than anything else, examples of success are the best way of reinforcing a new mindset and facilitating action by more individuals.

¹ Ninth Malaysia Plan 2006-2010, The Economic Planning Unit, Prime Minister's Department, May 2006, P. 26.

² Ibid., P. 50

³ Ibid., P. 529

⁴ Ibid., pp. 81-89

⁵ Ibid., P. 99

⁶ Ibid., P. 89

⁷ http://agrolink.moa.my/dpn/dpn3/nap_summary.pdf

⁸ Ninth Malaysia Plan 2006-2010, The Economic Planning Unit, Prime Minister's Department, May 2006, P. Ibid., 98

⁹ Ibid.

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¹¹ Figure from Various sources and calculations

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