

# DR. MELECIO MAGNO BALIK SCIENTIST AGENDA FOR THE SCIENCE CITY OF MUÑOZ

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## CONTENTS

EXECUTIVE SUMMARY, 3

INTRODUCTION, 6

Statement of Purpose, 6

Elevating the Science and Technology-Oriented Development Thinking, 7

The Science City of Muñoz in Line with Regional and National Development Goals, 8

Sticking to the Tsukuba Science City Model, 9

Aligning the Charter of the Science City of Muñoz with the Central Luzon Regional Growth Area, 9

THE ENABLING LOCAL AND REGIONAL DEVELOPMENT POLICY ENVIRONMENT, 10

The Central Luzon Economic History and Growth Model, 10

The Science City of Muñoz as the Central Luzon Science and Education Center, 11

Crafting the Science City Muñoz Development and Investment-Oriented Master Plan, 12

The Balik Scientist Program of DOST for the Science City of Muñoz Named After Dr. Melecio Magno, 13

PLANNING FRAMEWORK, 14

Goal, 14

Specific Objective, 14

Results, 14

Activities, 15

The Logical Framework for the Agenda, 15

OPERATIONAL STRATEGIES, 16

The Balik Scientist as the Anchor Institution Building Model for the Science City, 16

Creating an Independent Body with Public-Private-Partnership Orientation, 16

Development and Investment-Oriented Master Planning, 17

Establishment of Investment Fund Through Pooled Financing and Open-Source Investment, 17

Building Multiple Levels of Connection Under the Science City Development Corporation, 18

RESOURCES AND FUNDING FACILITIES, 18

The Host Institutions for the Balik Scientist Program, 18

The Balik Scientist Recruitment Facility for the Science City Muñoz, 19

The Science City Development Corporation, 19  
Funding Facilities and Opportunities, 19  
    The Science City Muñoz Investment Fund, 19  
    The Official Development Assistance as Foreign Investment in the Science City, 20  
    Exploring Existing Funds Generated Through Official Development Assistance, 21  
    Available Funds by Virtue of Existing Laws, 21

The Start-up Impact Projects, 21  
    Dairy Mart, 21  
    Onion and Cold Storage Corporation, 22  
    Integrated Animal Genetics, Diagnostics, and Feeding Trials Facilities, 22  
    Pantabangan Project, 22  
    Candaba Delta/Swamp Project and River Basin Research Center, 23  
    Muñoz Science City Orchid Micropropagation Project, 23  
    Row-Rice Farming Through Consolidated and Organized Approach, 23  
    The Fish Farming Complex, 24  
    The Salt Farm Project, 24  
    The Warehouse Store of Agricultural Input with Farm Machinery Pool, 24  
    Baloc Food Park, 24  
    Water Turbine Generator Project, 25  
    CLSU Research and Medical Center, 25  
    Science Education Training Center, 25  
    Electric Bus Assembly Plant, 25  
    Science City Museum and Innovation Center, 25  
    Science City Global University, 26  
    International Resort and Retirement Living, 26  
    International Agriculture and Engineering Consulting Consortium, 26

## SCHEDULE OF IMPLEMENTATION, 27

Stages, 27  
    Stage 1: Presentation and Negotiation  
    Stage 2: Recruitment of Scientists and Experts  
    Stage 3: Planning  
    Stage 4: Organizational Development and Access to Funding Set-up  
    Stage 5: Start-up Implementation of Impact Projects  
Activities and Required Expertise Schedule, 27

## BUDGET, 29

## CONCLUSION, 30

## ANNEX, 31

Annex 1: The Logical Framework for the Agenda, 31  
Annex 2: The Science City of Muñoz Development Corporation Summary, 33  
Annex 3: The Science City of Muñoz Investment Fund Summary, 35  
Annex 4: List of Interested Scientists and Experts, 38

# DR. MELECIO MAGNO BALIK SCIENTIST AGENDA FOR THE SCIENCE CITY OF MUÑOZ

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## EXECUTIVE SUMMARY

This Balik Scientist Agenda for the Science City of Muñoz aligns itself with solidifying the role of the city as the main science and technology hub in the Central Luzon growth region. Expatriate Filipino scientists and experts return to the Philippines for short-term and long-term assignments to participate in invigorating the drive for building the long overdue science and technology-oriented development model for the entire Philippines. The agenda leverages their expertise, experience, and connection for the purposes of rendering services in the planning activities and initial implementation of projects in line with the Science City of Muñoz master plan. After five years, the agenda expects to immediately contribute to strengthening the dual role of the city as a local government unit and a regional and national center of science and technology,

The agenda is named in honor of Dr. Melecio Magno (1920-2003), the Chair of the National Science and Development Board (NSDB) in 1978 when it was elevated into a national line agency. The board is now the Department of Science and Technology (DOST). Dr. Magno, who was born in the old town of Muñoz, Nueva Ecija, supported the Balik Scientist Program as the Chair of NSDB. As the first Minister of Science (equivalent to the Secretary today), he advocated for a mission-oriented national research and development program. Dr. Magno earned his degree in Mining Engineering (Cum laude) from the University of the Philippines. He studied at Johns Hopkins University in Maryland for his Master of Science and Ph.D. degrees in Physics.

The Science City of Muñoz installs a dynamic science and technology-oriented economy that spirals its impact in the Central Luzon region by building tangible physical and institutional

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<sup>1</sup>Principal author. He was born in Muñoz, Nueva Ecija, and grew up in a place adjacent to the campus of the Central Luzon State University (CLSU), where he attended high school. He earned the degree of Bachelor of Science in Agricultural Economics (1983) from the University of the Philippines Los Baños. He was awarded the British Chevening Scholarship to study for the degree of Master of Science in Social Development Planning and Management at the Centre for Development Studies of the University of Wales Swansea, now Swansea University, in the UK (1990-91). He is an international development consultant to private firms and international organizations and gained experience in the US, Africa, and the South Pacific. Relevant work to the proposal is the book he published entitled "Business Models for Collective Governance."

infrastructure based on the model used in drafting its charter, which is the Tsukuba Science City in Japan. Tsukuba is also a rice farming community outside Tokyo. On this basis, the science and technology-oriented master plan for the Science City of Muñoz combines the agricultural base and educational and research institutions components of the science city.

Science City of Muñoz envisions a master plan that intends to contribute to the regional economic progress of Central Luzon. The said regional growth model mirrors an ecosystem of development enterprises and public and transport infrastructure between two important international waterways, the Pacific Ocean in the eastern part and the China Sea in the western part of the region. This regional development model adopted by the Presidential Commission for the Central Luzon Growth Corridor in 1992 is the W-Corridor that defines the region's growth areas and a strategic approach to promoting Central Luzon as an investment destination. Two investment opportunities that explore the resources of the Pampanga River, the region's most important river, are inserted.

The W-Corridor starts in Masinloc, passes through Subic in Zambales; and goes down south to the Bataan Peninsula; then the inclined line goes up to Tarlac covering the Hacienda Luisita after passing through Clark Field in Pampanga; then goes down to the Candaba Swamp/Pampanga Delta created by the overflow of the Pampanga River covering parts of Nueva Ecija and Bulacan; and down to the Jewelry Center in Mecauyan; then it goes up again to Muñoz Science City and the letter W final ends in Pantabangan in the Northwestern part of Aurora where the Pampanga River starts, and Casiguran in Aurora on the Pacific Ocean.

The goal of the agenda is to build a sustainable agro-industrial economy in the Science City of Muñoz as the science and technology hub of the Central Luzon Growth Region. Its specific objective is to align itself with the Muñoz Science City's regional contribution. To attain the goal and specific objective of the Balik Scientist agenda for the science city, the desired results are: a) prepared a development-oriented master plan for the Science City of Muñoz in accordance with the envisioned Central Luzon growth model; b) established the Science City of Muñoz Development Corporation as a public-private partnership entity with the Balik Scientist Program as the provider of the initial anchor human resources capacity enhancement support; c) established the Science City Investment Fund with a dedicated research fund for the recruitment of scientists and implementation of initial project development activities for investment promotion and generation; d) initiated laying down the groundworks for initial impact projects for creating the initial shape of the Science City of Muñoz agro-industrial model in the context of mission-oriented science and technology advancement for regional and national development.

These initial projects are a) Dairy Mart as a brand for a functionally integrated system in line with the development of the dairy industry in the Philippines with the Philippine Carabao Center and the Central Luzon State University as the anchor institutions; b) the Onion and Cold Storage Corporation, which is a private corporation to be created through public private partnership among farmers' cooperative, the private sector, and the government sector, including the establishment of the Onion Research Center at CLSU; c) the Integrated Animal Genetics, Disease Diagnostic, and Feeding Trial Facilities in partnership with the CLSU College of Veterinary Science and Medicine; d) the Pantabangan Project for reviving the mega infrastructure project in the context of river basin development planning; e) the Candaba Project as integrated infrastructure that addresses the perennial problem of flooding in Candaba Swamp/Pampanga Delta and include the establishment

of the a river basin research and development center at CLSU in collaboration with the National Irrigation Administration and the Engineering Brigade of the Philippine Army; f) the business outsourcing for the orchid micropropagation for the principal purpose of establishing the plant micropropagation industry in the Science City and its neighboring towns; g) the food park infrastructure in Baloc, Sto. Domingo, Nueva Ecija, with satellite agro-industrial complex in the other provinces of Central Luzon; h) water turbine generator project; i) mechanized cultivation of row-rice farming through consolidated and organized approach; j) the fish farming complex; k) the salt production project in coastal areas of Central Luzon; l) the warehouse store of agricultural input with farm machinery pool, m) the research and medical center including the establishment of the CLSU College of Medicine; n) the teacher's training center at CLSU with the Science High School as the laboratory; o) the electric bus assembly plant; p) the Science City museum of science and industry and center of innovation; q) the global university in the science city; o) the international retirement living and resort, and r) the science city international agricultural and engineering consortium, which will be engaged in research and the development of science and technology-oriented business models within the Central Luzon region.

Operational strategies the agenda employs include the Balik Scientist as the anchor institution-building model for the science city; creating an independent entity with a public-private partnership operational structure; embracing development and investment-oriented planning; establishing an investment fund through pooled financing and open-source investment; and building multiple levels of connections on the world. national, regional, and local levels, including with the international development assistance community.

Resources to be used in the Balik Scientist agenda that are most important are the host institutions within the city supported by national line agencies, the recruitment facility in the U.S. for attracting participants best fitted to the mission-oriented activities and projects outlined in the agenda, the creative funding resources that can leverage available local and international funding facilities and international grants, and the start-up impact projects that the scientists and experts are going to be immediately immersed with.

The schedule outlines a five stages approach over a period of five years. The first stage deals with presentation and negotiation with host and sponsoring institutions, the Science City of Muñoz and the DOST, in particular. The second stage deals with the recruitment of scientists and experts, which is a continuous process. The third stage is planning, which is also a continuous process. The fourth stage deals with organizational development and the setting up of access to funding facilities. Finally, the start-up stage, which deals with the implementation of impact projects is the fifth stage.

The indicative budget over a five-year period is ( ). The bulk of the budget is earmarked for the recruitment and deployment and scientists and experts according to the guidelines of the Balik Scientist Program. The remaining is for planning and organizational development cost, largely for the preparation of the Science City of Muñoz master plan, the establishment of the development corporation, and the setting up of the investment fund.

The technical studies, organizational preparations, and the infusion of knowledge, experience, and connection to the master plan of the Science City of Muñoz expect to trigger greater interest from national line agencies, private partners, international donors, and domestic and international

investors in the city's development drive. On the other hand, the creation of various offices and project companies for the different impact projects ensures the dynamic and harmonious interplay of research, education, training, manufacturing, and service activities in building a science and technology-oriented economy for the Science City of Muñoz thereby asserting its role as the science and technology hub of the Central Luzon growth region.

The Balik Scientist Agenda first stimulates the science community members consisting of CLSU, PhilRice, NFRTC, BPHRE, PhilMech, and PCC. This expected result underscores the importance of a mission-oriented organizational capability building that is vital to leveraging the funding and technological resources that are essential for the science and technology-oriented development of Muñoz Science City. The model is therefore more powerful and goes back to the old mission-oriented research and development for the Philippines as envisioned by Dr. Melecio Magno.



# ANNEX 1

<b>LOGICAL FRAMEWORK</b>				
<b>BALIK SCIENTIST AGENDA FOR THE SCIENCE CITY OF MUNOZ</b>				
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	<b>Intervention logic</b>	<b>Objectively verifiable indicators of achievement</b>	<b>Sources and means of verification</b>	<b>Assumptions</b>
<b>Overall Objective</b>	Built a sustainable agro-industrial economy in the Science City of Munoz as the science and technology hub of the Central Luzon Growth Region	The environment is created for the relocation of government and private research organizations into the city; Attracted industry locators that generated jobs and contributed to the increased in income of the city; Collaborative projects of organizations in the science city in other areas in Central Luzon increased	City investment report; jobs report; tax collection report	There is a healthy investment climate in the Philippines;
<b>Specific objective</b>	Aligned the Balik Scientist Program with the Munoz Science City's contribution as a science and technology hub in the Central Luzon Regional Growth Region	The Balik Scientist agenda for the city contributed to improved collective organizational capability of the institutions in the science city through the formation of the development corporation, the establishment of the investment fund; and the implementation of impact projects	Reports on completed studies; Project completion reports	The DOST cooperated in recruiting scientists and experts for the Munoz Science City master planning and related activities; The city council of Munoz approved the implementation of a development and investment oriented master planning activities with less political interference
<b>Expected results</b>	1. Prepared development and investment oriented master plan	The master plan for the city completed and launched with promotional campaign handled by a professional fund manager	Master plan report	Full cooperation of the Science City and the member institutions in the Munoz Science Community attained
	2. Laid down the groundworks for nital projects	Half of the proposed impact projects had completed feasibility studies and with funding commitments within three years and at least 5 of them took off. i.e. Dairy Mart, Onion Corporation, Water Turbine Generator; Row-Rice Farming; et.	Feasibility studies report	Policy climate in the Philippines remain supportive of projects concentrated in the Munoz Science city and other parts of Nueva Ecija and Central Luzon
	3. Established the Science City Development Corporation	A development corporation serving as the umbrella organizations of different stakeholders, project companies, international aid agencies, government organizations, and local organizations is operational	Corporation registration; Memorandum of agreement	Legal issues regarding the establishment of the development and investment corporation settled
	4. Established the science city investment fund	Investment fund operational in partnership with a Fund Manager; Existing funds from existing government funding mechanisms aligned. i.e. Agri-Agra Law, RCEF, PL 480	Funding pledges, investment promotions report	Investors satisfied with the viability of master plan of the Science City of Munoz and the projects included in the list of initial impact projects regardless of any national economic climate
	5. Established multiple levels of connection	Consortia for different connections dedicated to the science city operational	Consortium reports; membership reports; financial reports; accomplishment reports	The operations of the consortia are not affected by political and economic instability in the national government



Activities				
<b>1. Prepared development and investment oriented master plan</b>				
1.1 Present the draft conceptual framework for the preparation of the master plan for the Science City of Munoz to the city council, the members of the Munoz Science Community, DOST, and other international funding agencies	The city council approved the master plan; DOST committed support through the Balik Scientist Program; Other agencies expressed support	City council resolution; letters of commitment	The planning team followed the guidelines	
1.2 Recruit scientists	Scientists and experts recruited for short-term, medium-term, and long-term assignments according to the plan	Recruitment report	Expatriates with expertise available	
1.3 Create the planning team for the master plan	Planning team for the master plan and the investment fund created through a mix of expatriate experts and local and national counterparts and some international development assistance	Recruitment report	Expatriates with expertise available	
<b>2. Laid down the groundworks for initial projects</b>				
2.1 Create the planning team for every start-up impact project	Half of the projects with planning team created	Project report	Expatriates with expertise available	
2.2 Recruit scientists and experts for each project	Scientists and experts recruited	Project report	Expatriates with expertise available	
2.3 Finalize feasibility studies	Completed feasibility studies for half of the projects	Feasibility studies report	Host institutions provided support	
2.4 Negotiate for funding	Funding negotiation completed	Funding pledges document; MOU signed	Generate guarantees for the projects	
<b>3. Established the Science City Development Corporation</b>				
3.1 Prepare the draft of the charter of the corporation	Charter of the development corporation finalized	Charter of the corporation completed	Legal issues hurdled	
3.2 Register the corporation	Corporation registered	Corporation registration	Ownership issues settled	
3.3 Convene the board	Board meeting convened	Minutes of board meeting	Transparent board of directors election held	
3.5 Establish the corporate office	Office established	Office launch report; contract for the office	Start up fund for the office made available	
3.6 Recruit staff	Management staff recruited	Staffing plan and recruitment report	Staffing plan followed	
3.7 Implement projects	Project take off started	Project reports; MOUs		
<b>4. Established the science city investment fund</b>				
4.1 Finalize the charter of the fund	Charter of the investment fund prepared	Charter report	Support from host institutions within the science community and from national line agencies available	
4.2 Organize the investment fund	The investment fund registered as a legal entity	Registration report	Legal issues regarding the establishment of the investment fund settled	
4.3 Recruit anchor investor	A conglomerate of international anchor investors with local partners recruited	MOA for the investment funds	Science city issued government bond to guarantee the investors	
4.4 Hire the fund manager	Fund manager hired	MOA for the investment fund	Bidding process to hire Fund Manager successful	
<b>5. Established multiple levels of connection</b>				
5.1 Establish consortia at various levels	Cosortia at various levels established	MOAs; commitment letters from international investors and donors	Natural grouping of stakeholders ensured	
5.2 Establish a link through International assistance	International assistance made available in support of the Balik Scientist agenda	MOAs, commitment letters from international investors and donors	The DOST, the Science City, the Development Corporation, and the Investment Fund enter into working cooperation for the pooling of international assistance	

## **Annex 2**

# **Science City of Muñoz Development Corporation**

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## **SUMMARY**

More than two decades after the old university town of Muñoz, Nueva Ecija was granted the charter as the first science city in the Philippines, the status of the city is still far from the model used for drafting the said charter, which is the Tsukuba Science City in Japan. Tsukuba is a planned city, and its establishment was sponsored by the top policymakers in the Japanese governmental hierarchy from its inception in the early 1960s. The journey of the Science City of Muñoz, on the other hand, has been largely a local government initiative with little national government support until today. On this basis, the slow transition from a rice-farming university town to the country's first science city is apparently reasonable because it took also two decades for Tsukuba to have a clearer shape. In other words, it is not still late for the Science City of Muñoz in keeping pace with its model.

Until today, the local community is not yet demanding a science city like the envisioned Tsukuba Science City model. On the other hand, the core institutions comprising the science community, which include CLSU, PhilRice, PCC, BPHRE, NFRTC-BFAR, and PhilMech are not noticeably clear about their role in the process of transformation. Nonetheless, being the first science city in the Philippines granted through the approval process that passed through the Department of Science and Technology and finally, the Philippine Congress, the Science City of Muñoz deserves more vigorous national attention. It is about time to look at every piece of the puzzle in building the Science City of Muñoz with the real image of the Tsukuba Science City model.

There is one program that can trigger the process of putting the pieces of the puzzle together into one solid mass for the necessary transformation into a planned science city. This is the Balik Scientist program of the Department of Science and Technology. We have proposed a special focus Balik Scientist agenda for the Science City of Muñoz. This agenda first aligns itself with the preparation of a master plan for the city. The said agenda is in line with building a dynamic science and technology-oriented economy through tangible physical and institutional infrastructure. The city eventually solidifies its role as the science and technology hub in the Central Luzon growth area.

The integrated approach to science and technology and investment-oriented development is a salient feature of the science city master plan. Its operational strategies include the Balik Scientist as the anchor institution building model for the science city; creating an independent entity with a public-private partnership operational structure; embracing development and investment-oriented planning; establishing an investment fund through pooled financing and open-source investment; and building multiple levels of connections on the world, national, regional, and local levels, including with the international development assistance community.

Therefore, one of the key operational strategies is the establishment of a legal corporate body that puts order and direction to the inclusive science city development model. This semi-autonomous or autonomous organization creates and holds together the multiple levels of connection for addressing the science and technology business concerns as outlined in the master plan. The development corporation is mandated legally with corporate power so that it can make itself financially self-reliant. The corporation's charter stipulates isolation from political interference, but the science city government is still adequately represented politically by checks and balances in the policy direction of the development corporation.

This development corporation can initiate the establishment of project companies. Ownership interest in different project companies is open according to their charter and corporation laws of the Philippines. It has also the power to approve board policies on ownership and dividend distribution earned by locally initiated or internationally invited firms.

Furthermore, the development corporation also performs the role of an advisory body to the local government affairs of Science City concerning science and technology-oriented development activities. It has also executive management power that performs technical, administrative, and financial support for its operations.

In terms of membership, the different sectors in the Science City in accordance with the charter of the development corporation are its vital parts. These local sectors, including outside parties, can engage in business for or with the development corporation as an individual or a collective body, whether directly or indirectly.

The Science City Development Corporation provides the structure and order for interconnected development infrastructure through multisectoral collaboration and sustainable investment strategies. Areas of business interests initially covered by the development corporation as outlined in the Balik Scientist Agenda for the Science City of Muñoz include the building of food park infrastructure, onion production and research and development, warehouse store of agricultural inputs and machinery, the establishment of river basin research center with Pantabangan and Candaba Swamp as areas of interest, renewable energy, livestock and veterinary services facilities, hybrid, aquaculture complex, health care facilities, clean energy infrastructure, electric bus assembly plant, and other business opportunities to be developed in line with the inclusive investment agenda that the development corporation desires to engage. These development enterprises will be established as financially sustainable entities, even the proposed river basin research center and the onion research and development center.

The network of project companies and various subsidiaries is fastened by the active collaboration

among the government sector, the private sector, international investors, and beneficiary groups in the science city and the neighboring areas in Central Luzon. Furthermore, the development corporation transforms itself as the principal corporate haven for innovative ideas that can be translated into business and development project opportunities.

Since the first group to be formed is the consulting company, which will be responsible for further project development and funding negotiation, the success of the different companies and the group of companies largely depend on this unit.

## Annex 3

# SCIENCE CITY OF MUÑOZ INVESTMENT FUND

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## SUMMARY

In line with preparing for the Science City of Muñoz its master plan for agro-industrial development of the city as a vital component of the Central Luzon grown region, the establishment of an investment fund introduces a more realistic and flexible approach to the mobilization of capital, human, and technological resources. The main idea is to build the funding structure first or simultaneously with the preparation of the detailed master plan for the science city.

The establishment of the investment fund is based on the book **Business Models for Collective Governance** written by Eduardo Bacolod. Chapter 2 of the book proposes an investment fund model that is inspired by the US Rural Infrastructure Opportunity Fund, which was launched on July 24, 2014. The US fund was established to serve as a new source of capital for infrastructure projects and to promote financing for infrastructure projects in rural areas in the US. The said fund in the US is designed to complement existing government loan and grant programs by making debt investments in a wide range of projects in America's rural communities.

The investment fund for the Science City of Muñoz is therefore being proposed. The said fund aims to build the principal funding structure for the agro-industrial development of the science city as the main science and technology hub in the Central Luzon Region. Its aim is to mobilize capital resources, which will be vital in the mobilization of human and technological resources. The fund also aims to build a structure for different forms of business collaboration among various participants.

The Investment Fund starts through the initiative of an anchor investor, a development bank that provides the initial capital as the foundation as well as the catalyst of the investment fund. An international fund may also assume the role of the anchor investor. The fund is also a structure that recruits new sources of private capital to support infrastructure and other development projects. The fund can also be used as a private lending facility in support of projects that are technically and financially feasible.

The fund is managed by a Fund Manager, which is a financial services company that has a proven track record. The Fund Manager is responsible for addressing the fund management and the legal compliance of the fund. The Fund Manager is also responsible for recruiting investors.

The open-source investment that aims to attract good business models is employed.

As a depository of knowledge and funding resources, the Science City of Muñoz Investment Fund will be able to provide the structure with operational mechanisms for multi-sectoral partnership. While the role of the government is important for setting the strategic development direction, the functional and harmonious relationships among the participants within the national development agenda are worthy of consideration.

The preliminary structure of the investment fund, which is going to undergo further refinement after a series of consultations and legal research is presented below.



