

Science & Technology Policy of Lao PDR

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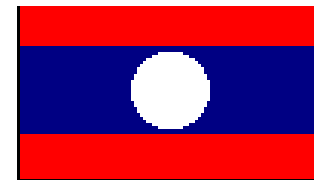
- I. S&T Policy context in LAO PDR**
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I. S&T context in LAO PDR





Country Background



- **Geography:**
 - Landlocked and mountainous Country of 236,800 Km² with 70% high land.
 - 1,898 Km along the Mekong river
 - 17 provinces, 142 districts and 10,912 Villages
- **Population :**
 - 5.9 million (2006). 39 % still lives in poverty.
 - Average 6 persons per family with Growth rate of 2.8 %.
 - 83% residing outside urban areas
 - Adult (15-40) literacy rate: 83 %, Children (6-10) school enrolment: 80%. Only 6% of bachelors (31.000 in 2005) continue to study in the only one university “ NUOL”.
- **Economy:**
 - Mainly based on agriculture, which employs over half of the workforce and contributes 50.9% of GDP. Industry:23.4% and Services 25.7 %) .
 - Annual per capital income US\$290 in 2000, 490 in 2005 .
 - GDP increase 6-7% per annum. Budget deficit of 8.2% of GDP
 - Lao PDR is still a LDC country.
 - The Budget revenue cover only 13% of the GDP. 90% of investment for socio-economic development come from international aids and assistance.
- **Politic:** Stable regime. (www.invest.laopdr.org) (www.moc.gov.la)
(www.laotourism.org)

I.1. General information

Lao PDR is a kind of unexploited country in term of Natural Resources with high potential development of Hydro power, Mining, and Archeological sites.

- **Our main export products:**
 - Wood products (Round logs, Semi and finished wood products.)
 - Non timber forestry products.
 - Agricultural products (coffee, tobacco, ..)
 - Industrial products (Electricity, Lao Beer, Gold, Tin , Motor bicycle,..)
- **Our main import products:**
 - Mainly Agricultural equipment and every things to satisfy the public's need.
- **Our main Investment sectors :**
 - Wood processing (Saw Mill, Furniture, ..)
 - Industrial wood plantation (sugar cane, Jatropha, Agar wood, ..)
 - Hydro power/ Mining /Agriculture /Infrastructure (Road, Bridge, Telecom. network, ..) / Garment

(www.moc.gov.la/statistic.asp)

I.2. LAO S&T Institutions' background

- **1967 establishment of Geology and Mining Department (Ministry of Energy & Mining).**
- **1982 establishment of State Committee of Science and Technology (Now STEA)**
- **1985 establishment of 3 Research Stations:**
 - 1. NAPHOK Station for rice species research**
 - 2. SALAKHAM Station for plant diseases and insects research.**
 - 3. NONG TENG Station for fish species research**
- **1983 establishment of National Arts and Literature Research Institute(1993 Culture Research Institute)**
- **1995 establishment of National University of Laos with 11 Faculties. (www.nuol.edu.la)**

Cont'

- **1999 establishment of Agricultural and Forestry Research Institutes with 10 Research Centers:**
 1. **Soil survey and classification Center**
 2. **Plants, Vegetables and Fruits Research Center**
 3. **Coffee Research Center**
 4. **Nordic Agriculture-forestry Research Center**
 5. **Livestock Research Center**
 6. **Fishery Research Center**
 7. **Forestry Research Center**
 8. **Forest Survey and Planning Center**
 9. **Agricultural and Forestry Mechanical Research Center**
 10. **Slope Land Agriculture Research Center.**
- **2000 establishment of Health Science Institute with its 7 Research centers:**
 1. **Traditional Medicine Research Center**
 2. **Paludism Center**
 3. **Analytical and Epidemiology Center**
 4. **Maternal and Children Center**
 5. **Ophthalmology Center**
 6. **Health Information Center**
 7. **Clean Water Center**

I.3. The Science Technology and Environment Agency's main activities

In the past STEA has :

- Undertaken numerous experimental and application researches to adapt technology with the Lao context and culture.**
- Concentrated its efforts in undertaking on the job training that contributing to the up gradation of our Scientifics, Engineers & Technologists (SETs)**
- Formulated and drafted some necessary S,T& E Policies, plans, Programs , Projects and activities, Regulations, Decrees, Laws.**

(www.stea.gov.la)

I.4. Constraints

- **We may say that S&T R&D in Lao PDR is still in the initial stage.**
- **S&T R&D has been undertaken with very limited Resources, harmonization and management mechanism is not yet in place .**
- **Lack of 4 M.(Manpower, Money, Material &Management)**
- **Education system still in the infant stage, only one University (just open, just think about R&D with the vision to establish a kind of commercialized University in the future). Private education well being developed.**
- **The coordination and cooperation between University and Industry are just promoting and encouraging.**

At the results, the products are not reached international standard and in conclusion we are still far behind in term of S&T R&D.

I.5. S&T Globalization and Trends

- **S&T R&D has enabled “Globalization “ (Peaceful, Cooperation and Competition). In order to realize this advantage, many countries have concentrated in to Research investment as well as S&T R&D especially in the application and innovation.**
- **In the context of world environment degradation, S&T shall be use in the sustainable and proper way.**
- **In the New millennium, the ICT become an important and necessary tool for the human daily life and for the socio-economic development.**
- **BIO and NANO-technology are sound and very useful Technology.**
- **Renewable energy R&D is a choice for solving energy problem .**
- **Automation system (Robot, automatic machine..) will replace labor force**
- **The waste become raw materials for new kind of industry.**
- **S&T play an important role in socio-economic and industry development.**
- **S&T is the basis for knowledge creation and for understanding the cause of natural events.**
- **Scientific & Technical Research is a decisive factor of S&T application, adaptation and innovation.**
- **S&T are consider as a driven Force/ Engine for Socio-economic Growth.**

II. S&T Policy of LAOPDR until 2015

II.1. Objectives

- 1. To stimulate and disseminate the application of S&T results for improving productivity.**
- 2. To implement and focus in S&T activities aiming to upgrade the population's standard of living and accelerate the National Socio-economic Development.**
- 3. To upgrade the LAO Scientists' capacity in S&T and promote the important Role of S&T in the process of socio-economic development.**
- 4. To ensure and improve strongly S&T R&D infrastructure in different sectors.**

II.2. Goals

1. To improve S&T R&D to ensure the mobilization of S&T resources,
2. To upgrade education for higher S&T knowledge aimed to serve agricultural, industrial and Services development contributing to the poverty reduction strategic program and to the industrialization and modernization of the country .
3. To strengthen the coordination and cooperation between different sectors and Research institutions for ensuring the participation of the production sectors and scientific community for maximizing the country's benefit from S&T.
4. To upgrade and strengthen the Public's S&T knowledge.
5. To promote essentially the adaptation and innovation of S&T.

National cross-sectored priorities in S&T

- 1. Strengthen the establishment of S&T infrastructure**
- 2. Create regulations & legislations for the promotion of S&T Research activities .**
- 3. Establish the management, development and coordination mechanism on S&T R&D.**
- 4. Support Enterprises effectively, Master, Import and transfer of technology to improve productivity and quality of products.**
- 5. Encourage the applied, innovative and adaptive Technology.**
- 6. Analyze thoroughly important investment Projects.**
- 7. Pay special attention on education & training of SETs in different sectors and select the talented SETs for innovative research.**
- 8. Follow up, control, evaluate and estimate the importation of new technology.**
- 9. Focus on investigation survey activities to collect information serving as database for planning activities.**
- 10. Widely use the internet and ICT.**
- 11. Develop the biotechnology and genetic engineering .**

Agriculture and Forestry sectors

- **Concentrate on agricultural research by emphasizing on the new efficient and resistant variety/specimen of cereals /plant / livestock and other by using bio-organic as fertilizer and using biotechnology .**
- **Develop the effective system of control, protection and prevention of the animal and plants disease .**
- **Give attention to the land use protection, land classification, utilization and prevention of the land degradation and desertification as well as ecosystem protection and geology for better balance of nature.**
- **Study, develop, protect, regenerate and use sufficiently, efficiently and sustainable natural water resources .**
- **Protect, manage and develop forestry resources for ensuring the needs of socio-economic development and protection of ecosystem balance for improving environment quality.**
- **Study and sustainable exploit the Non timber forestry resources for domestic use and for export.**

Industry Sector

- **Develop and promote small and medium enterprise (SMEs) industries and handicrafts by using efficient and appropriate technology (low waste, low affect to the environment, competitive quality and price) and using local raw material.**
- **In order to substitute the import products the assemblage of micro-electronic industry, mechanics, metallurgy and minerals industries should be encouraged and developed.**
- **Elaborate hydro-electric and renewable energy policy upon to the geographical potential of the country with sustainable manner.**
- **Establish some Pilot Centers :**
 - **Technical Advisory Center**
 - **Quality & Standard Testing Center.**

Construction and Transport sector

- Promote the research on urbanization system suitable to the particularity of geography, socio-economic development in each area for ensuring the facility, security, beauty and preserving national and ethnic cultural heritage.
- Encourage the research on standardized construction materials, secure on safety and environment that meet to the social services and for some export.
- Promote the creation of inland transportation networks in support to the defense, seasonal distribution, markets access and tourism development.
- Stimulate the soil classification and land utilization in conformity with the construction regulations including ensuring the easier management.

ICT sector

- Improve and develop widely, speedily, reliable and with quality the infrastructure of ICT to enable the internet and multimedia link and serve different areas and sectors of the society inside and outside the country.
- Promote and encourage the creation of office automation for improving the productivity and management art.
- Promote and support the Lao localization R&D software.
- Create opportunities and develop the capability of National SETs in the field of ICT to contribute in the e-gov. program .
- Create the awareness on ICT and produce information centers for the profit of society by avoiding dissemination of information affecting the negative impacts to the society.
- Create opportunity for public access to the information.

Environment sector

- **Study, encourage and develop efficiently appropriate technology for natural resource use and management and for the prevention, reduction and minimize of pollution and waste.**
- **Study and develop the capability of S&T application for sustainable development.**
- **Choose and use clean and appropriate technology for the production, recycling and treatment.**
- **Stop and Refuse to use certain chemical substance.**
- **Promote and use the renewable energy.**
- **Undertake the evaluation and environmental impact assessment for projects.**
- **Promote the utilization of modern technology for environment management**
- **Enhance the creation of awareness on environmental protection and sustainable natural resource application.**
- **Undertake the bio diversity research.**

Health sector

- **Improve thoroughly health science research infrastructure.**
- **Upgrade knowledge, skill, expertise of staffs and modernize hospital and equipment.**
- **Promote strongly the use of traditional medicine combined with modern medicine.**
- **Undertake the drug production for local use and then improve quality for export.**

Commerce, Services and Tourism sectors

- **Enlarge the commercial relation and international investment in the field of S&T.**
- **Develop communication , transport and other facilities / services infrastructures(e-business, e-banking..)**
- **Develop cultural & natural tourism.**

Economy sector

- **S&T shall be considered as a driven force for economy growth**

Social and human science

- **Study on Research on existence, evolution and development of LAO people and its minority group ethnic.**
- **Promote the management, encourage the research, preserve, protect and develop the heritage and magnificent culture of the nation and ethnic minorities including the archeological and historical sites.**

Research and Development (R&D)

- Focus on the applied and adaptive researches
- Pay more attention on the socio-economic and techno-economic analysis and Environmental Impact Assessment (EIA) of projects in order to maximize benefit and minimize negative effects.
- Use the remote sensing technology to:
 - Carry out the assessment, monitoring and management of forest cover, forest fire, land use, meteorological and disaster situation.
 - Undertake research on soil erosion , agricultural crops monitoring, geology, rural settlement.
 - Study and evaluate the flood and drought situation.
 - Manage the water resources (catchments areas and reservoir, irrigation..)
 - Set up the network of geographical information system for the exchange of data and distribution among agencies and research institutions.
 - Promote and encourage the application of satellite data for natural resource survey and planning in the specific areas and impact assessment.

III. Direction , Promotion and Major Policy for the implementation of S&T development

III.1. H.R.D

- **Define the HRD plan in medium and long term at all level.**
- **Promote a S&T culture in the curriculum of different education level.**
- **Develop the S&T curriculum of the NUOL to provide Masters and PhD in S&T.**
- **Develop the capability of appropriate Research centers to conduct training courses in priority sectors.**
- **Promote the establishment and the expansion of vocational and technical school in both public and private sectors. Reform the educational system in S&T.**
- **Encourage the training for high qualified and talented SETs**
- **Assess the absorptive capacity of graduated SETs . Attempt to match the supply and demand for S&T professional in niche areas.**
- **Develop bilateral & multilateral programs for training of trainers in priority areas.**
- **STEAs shall take on the role of providing guidance for the selected S&T Schools.**
- **Organize regularly the training in different form.**
- **Mobilize the funds to establish some institutes with high quality in some priority areas.**
- **Apply effectively the S&T human resource development to fit the knowledge, competence and skills, use reward system for the talented and creative SETs .**
- **Upgrade SETs to enhance and encourage strongly S&T activities.**
- **Strengthen the creation of awareness in S&T and impregnate into live style.**

III.2. Industry development

- **The development of a vibrant industry sector is an important step in achieving national development goal, notably poverty reduction. Globally competitive industry requires knowledge and technology to produce goods and services to an acceptable standard.**
- **Recognize that substantial growth of the S&T system in Lao PDR requires a strong demand from the trained and qualified personnel and even though the strong support of business enterprises.**
- **Encourage NUOL and Research institution to work and cooperate closely with local industries.**
- **Explore strategies to attract and exploit the knowledge, skill and technologies of foreign companies in strategic sectors incentive, joint ventures, technology licensing agreement and exchange of staffs.**
- **Utilize existing indigenous knowledge and find ways to combine traditional and modern knowledge in productive enterprises.**
- **Organize a discussion on initiative for supporting the development of industrial technology in the future.**

III.3. S&T for natural Resource and Agriculture

Lao PDR has abundant biological resources and has a high proportion of population rely on subsistence agriculture. So that the application of appropriate S&T make an economical value and still attract international assistance for

- Baseline studies of environment and biodiversity,**
- Sustainable management of natural resources,**
- Environmentally development of ecotourism.**

III.4. Management & Coordination of S&T

- **The National S&T council should be established and be headed by the PM, alternatively an S&T Advisory Board should be established and headed by high level appointee with direct links to the PM. It should play a role of advisor in S&T to the Government.**
- **The council should compose of Representative of Ministers' cabinet , productive sectors and Experts in S&T from different sectors.**
- **The council should define the direction in S&T policy for the development.**
- **The STEA should undertake the supporting and coordinating function to promote S&T activities in the various implementing Agencies and help translating policy into action. STEA might establish a S&T policy support programs for the implementation of action programs in HRD, training in R&D, and obtain budget for targeted research areas. It might lead to establish the S&T Foundation.**
- **Establish a National S&T Research Institute to carry out:**
 - **The R&D in strategic field,**
 - **The management of Scientists' research and**
 - **The training.**
- **Establish a Committee of S&T in different Ministries and Provinces to act as Advisory Board Committee to the Ministry.**
- **Develop the appropriate and collaborative research center in close collaboration with the NUOL for improving the capability of S&T research aiming to promote the production and industrial development.**

III.5. S&T Investment

- **Use effectively the funds allocated by the Government (*4-5% of GDP/year for S&T R&D*)**
- **Mobilize the funds from private sectors**
- **Attract the international assistance & Coop.**
- **Create S&T Foundation .**

III.6. Institutional Arrangement for S&T

- **Strengthen the S&T network by combining the research laboratory, S&T R&D centers in different sectors with higher Education Institutes.**
- **Provide rights for research institution to do different functions (Owner of technology, Advisor, S&T Service Provider ..)**
- **Allow the permission to the Research Institution to be able to generate income from R&D.**

III.7. Promotion & Establishment of S&T Research & Culture

- **Create the spirit of S&T**
- **Promote the competitiveness in S&T R&D.**
- **S&T shall be promoted to play effective role in the society.**
- **Increase and upgrade the capability of Lao SETs**
- **Attract and incite LAO SETs and Business sectors to join and contribute to the research activities.**
- **Promote different incentive scheme for SETs in S&T development.**
- **Organize technology training courses for industrial development.**
- **Reduce taxation or Tax exemption for S&T activities.**

III.8. International Cooperation in S&T

- **Establish strategy of S&T R&D.**
- **Attract the international org. for contributing in HRD both in quantity and quality, for transfer technology, information network and joint research activities.**
- **Mobilize foreign financial resources for setting up some educational institutes and upgrade LAO SETs in different levels.**
- **Send regularly SETs to attend scientific and technologic seminar, workshop, training courses in abroad**
- **Incite experienced LAO SETs from abroad to come to LAO PDR as scientific expert or advisor.**
- **Invite foreign experts and volunteers to come to Lao PDR as scientific advisor.**
- **Apply incentive scheme for foreigners in which transfer advanced technology to Lao PDR.**
- **Promote , expend and strengthen international cooperation.**

III.9. Popularization of S&T.

- **Promote the establishment of SET Associations at National, Regional and Local level.**
- **Make a program of S&T popularization through mass media.**
- **Use schools, institutes and research Center as Popularization Center on S&T.**
- **Organize regularly S&T exhibition at different places and establish Scientific museum or Science Park.**
- **Regularly organize the award ceremony for the excellent SETs.**

IV. Action Programs for the next 5 years

IV.1. Infrastructure AP

- **Develop innovation system.**
- **Improvement of research capability of NRI.**
- **Improve and develop intellectual property infrastructure for R&D.**
- **Improve the ICT infrastructure and network (Fiber Optic as Backbone, PLC, Wireless..)**
- **Increase knowledge and competence of S&T.**
- **Create jobs for Excellent researchers .**
- **Improvement of curriculum of S&T in different education level and various school.**
- **Promote the learning of S&T .**
- **Increase quantity and competition by sending researchers to abroad.**

IV.2. S&T Management AP.

- **Review & Formulation of:**
 - **Transfer of technology policy, decree and law**
 - **Technology assessment and appraisal in various investment projects**
 - **Development of policy, plan , programs and Projects on the international basis.**
 - **Technology management for sustainable development Regulation**
 - **Creation of S&T Foundation**
 - **ICT policy, decrees, laws**
 - **Decrees on Congratulation and delivery of award for Excellent SETs and on the sanction for guilty persons.**
 - **Define the National SET day (S&T Exposition..)**
 - **Policy, decree and law for the protection of SETs, investors and consumers rights.**
 - **Policy, decree and law for the development of quality Control.**

IV.3. S&T HRD AP.

- **S&T HRD shall be focused on priority areas :**
 - **Agriculture, Industry, Tourism and Service provider.**
 - **Engineering (ICT, agricultural production& industry)**
 - **Bio-technology**
 - **Renewable energy**
- **Formation of Traditional industries' Professional and Technical**

IV.4. Creation of National S&T Research Institute AP.

- **Support the establishment of various National Research Institutes (NRIs).**
- **Encourage and Promote Research and Development for Goods production .**
- **Promote the linkage between Industries and NRIs.**

IV.5. Collaborative AP

STEA shall play an important and supporting Roles for the elaboration of various projects in different Ministries and Research institutions.

IV.6. Some possible AP

- **Renewable energy (Bio-fuel, solar..)**
- **ICT development (E-gov . E-commerce..)**
- **Develop Bio-technology**
- **Green health (Traditional medicine)**
- **Provide assistance to SMEs by improving and using new and updated technologies.**
- **Links between Producers (industries) and Researchers**
- **Sustainable Tourism Development.**

V. Measures for the Implementation of S&T Policy

- 1. Operate (4 - 5%) Budget allocated by the GOL that should be shared with other Sectors involved in the Development of S&T.**
- 2. The National S&T Policy shall be promulgated throughout the country for good understanding for plans, programs and projects formulation.**
- 3. This Policy shall be implemented effectively by State and Public Organizations .**

Thank you for your kind attention

Q & A