THE ROLE OF UNIVERSITY IN NEW & RENEWABLE ENERGY

Rohani Jahja Widodo
Retired Professor Electrical Engineering ITB
President of the Indonesian Control Systems Society (ICSS/MASDALI)
widodo.rohani@yahoo.co.id, rohani.jw@eng.maranatha.edu & masdaliwidodo@yahoo.co.id

ABSTRACT

This paper presents the role of university for improving the quality of social welfare and human life. Tridharma university is to develop Art, Spiritual, Science, Engineering and Technology (ASSET). Improving the quality of social welfare and human life has four universe aspects: Physical, Intellectual, Emotional and Spiritual (PIES) aspects. There are three basic requirements for improving PIES aspects: Material, Energy and Information (MEI). New/Renewable Energy can be developed efficiently and effectfly by tridharma university & ASSET. Those aspects are important inputs for Education & Training (E&T) and Research & Development (R&D) activities of tridharma university in developing of ASSET. High quality of social welfare and human life are desired output that must be attained from the activities the tridharma university. Current standard of human life should be reported as feedback information from the E&T and R&D activities. New/Renewable Energy have social impacts not only in developed countries but also in developing countries. In global communication, developed countries and developing countries should build several attractive and sound symbiosis bridges, to prevent loss of universe balances.

Keywords: Tridharma, ASSET, PIES, MEI, New/Renewable Energy, E&T, R&D, standards of human life, social welfare, developed countries, developing countries, global communication, symbiosis bridges.

INTRODUCTION.

Tridharma university & ASSET represent forces that strongly affect man, life, and civilization. ASSET are ethically neutral. It means that ASSET can be good and can also be evil. The goodness or evil is determined by the purpose and utilization. The purpose of tridharma university & ASSET is to support the development efforts, thus they constitute parts of the development while they also constitute the driving force for speeding up development.

The objectives of tridharma university & ASSET will aim at increasing the quality of human life. The skills of research staffs hopefully bring their bright ideas in designing clear vision for human and national development. Sustainable development must be supported by health economics. In an expose on healthy economics, the healthy industries are highly labor-intensive. Therefore healthy development is tied closely with the redistribution of income seen from two different aspects, namely with regard to equitable distribution the results of development, and with regard to expansion of employment opportunities. The expansion of job opportunities cannot be separated from tridharma university & ASSET and particularly from appropriate ASSET in the rural area. In this connection, one should keep in mind that in developing appropriate ASSET, one must pay heed to the local condition, such as tradition, customs and usages, standard of education, availability of infrastructure.

It is now generally accepted that the principle of appropriate ASSET comprises: 1). Low-cost, in proportion with the income level of the local population. 2). Providing job opportunities. 3). The tools and equipment used must be required only a few and simple maintenance. 4). The equipment and material should be locally available or only small quantities need to be imported. 5). In harmony with the local socio-cultural conditions. 6). Not needing any intricate infrastructure. 7). A high added value compared with ASSET being applied.

The increase of added value shall be achieved through applications of ASSET in that word’s widest sense. The ASSET developed must be adapted to social conditions, natural resources and the environment. A scientist graduate of high standard, when he is employed in developing countries, must adapt his technical skills to the natural condition in such countries, which will be quite different from what he would apply in developed countries.
The main constraint of tridharma university & ASSET development in developing countries is the fund, material and manpower. In this connection, it will be necessary to adapt the existing ASSET and bring them into harmony with the rural conditions in the countries. That is why it is necessary to emphasize the main managerial aspect that must cover the research of existing tradition, customs, and desires of community with regard to the local skills.

**METHOD**

*Tridharma university & ASSET Development*. There are two approaches that must be considered in tridharma university & ASSET development: Prosperity approach and Security approach. The prosperity approach will be mainly discussed in this paper. There are four aspects that must be accounted for: Physical, Intellectual, Emotional and Spiritual (P.E.I.S.) aspects.

![Diagram of tridharma university & ASSET development based on two approaches.](image_url)

The physical and intellectual aspects must be supported by Three Basic Needs (TBN): Material, Energy and Information. The New/Renewable Energy is one most important issue for our life today. *Tridharma* university must utilized for developing New/Renewable at all stage of development and activities of institutes: Education Institutes, Research Institutes, Government Institutes, Business Institutes and Industrial Institutes.

Energy Sources in the future are: Wind Power, Water Power (Tides, Ocean Currents, Ocean Waves, Ocean Thermal Gradients), Geothermal Power, Solar Power and Biomass Power. Subsystems of TBN are: 1) *Tridharma* university. 2) Demography (human resources). 3) Natural Resources. 4) ASSET. 5) Law and order. 6) Infrastructure.

The activities and development are consist of activities in: 1) Human resources development (E&T). 2) Research and development of ASSET. 3) Industry and manufacturing. 4) Implementations and applications of ASSET. 5) Repair, maintenance and rehabilitation.

R & D in developed countries for development new ASSET, but in developing countries R&D mostly only for importation and utilization of ASSET.

Basic Requirements tridharma university for development of ASSET. Major investments are already taking place to expand the production of commercial crops such as natural rubber palm oil, copra, tea, coffee, sugar, and pepper.

The second large area for further investment in tridharma university & ASSET infrastructure is energy and natural resources. In Indonesia we are therefore paying attention to possibilities in developing petroleum and natural gas based industries, which use oil and natural gas for feedstock and raw material, fertilizer, plastics, and fiber.
Fig. 2. Symbiosis of tridharma university between developing and developed countries.

The third area for expansion of tridharma university & ASSET facilities, efforts are being made to make industrial tridharma university & ASSET provide practical solutions to the various problems. The needs for communication and transportation infrastructure which includes sea transportation, air transportation, land transportation, and postal and telecommunication services and a network of radio and television are also important to be concerned. The transfer of tridharma university & ASSET relevant to the establishment of manufacturing plants to meet nations requirements for industrial products like the ones previously mentioned can only made effective through the consistent execution of realistic and integrated production plans progressively moving to more and more sophisticated tridharma university & ASSET involved in the manufacture of a particular industrial product.

Fig. 3. Process of activities, tridharma university with feedback.

To implementation of progressive manufacturing plans requires that the industrial manufacturers adopt an active and even aggressive attitude towards the acquisition of tridharma university & ASSET. They cannot remain passive and static waiting for ASSET to be passed on to them. In order to help develop this dynamics and active posture they must be sustained and supported by tridharma university & ASSET institutes and laboratories providing tridharma university & ASSET services relevant to the production processes and the tridharma university & ASSET intended to be acquired.

To this end, the government has to establish the Center for the Development of tridharma university & ASSET, an industrial tridharma university & ASSET estate planned to comprise a construction testing laboratory, an energy laboratory, a calibration and instrumentation laboratory, an electronics laboratory, a multi-purpose research reactor, a chemistry laboratory, a physics laboratory, an aerodynamics, gas dynamics, and vibration laboratory, a thermodynamics and propulsion laboratory, a process technology laboratory, and other laboratories.

This will become the focus of planned efforts to transfer, adapt and develop tridharma university & ASSET appropriate and useful for the creation and expansion of productive processes throughout the nations.
Defense related tridharma university & ASSET is the fourth area in which additional investments are to be made. The need to strengthen tridharma university & ASSET to support national’s defense and security capability is obvious given her strategic location, her abundance of resources and her unique geographic features. One nation must be able to control her area of jurisdiction and defend it against actions endangering her sovereignty, the achievement of the Objectives of her National Development, such as equitable distribution, growth, stability, and the progress of her efforts at nation building.

One nation has to be ready to commit resources to utilize defense tridharma university & ASSET relevant to the strengthening of her People’s Defense System adapted to the national cultural, geographic, and technological conditions, and to the manufacture of the weapons system appropriate to this system.

Lastly, a people committed to transfer, adapt, and further develop even the most modern tridharma university & ASSET and apply these in already existing cultural environments must take measures to prevent the application of new tridharma university & ASSET from eroding and destroying those cultural values upon which its national identity rests. As is the case in other societies, a national’s identity is exemplified by her own unique way of working and living together and by distinctive ways social order is created and maintain.

For some developing countries, they already possess ancient cultures long before she became a modern state. For the purpose of maintaining an orderly-balance between established cultural values and the new values inherent in modern tridharma university & ASSET research in the social sciences, in culture and in it’s philosophies of life has been designated as the fifth but perhaps the most important area in which infrastructure is to be strengthened.

The development of scientific infrastructure in this area is geared towards the maintenance of the ability of a nation’s people to preserve the compatibility of its cultural values with the progress of ASSET in the first four areas discussed previously.

To achieve this stage of development, tridharma university & ASSET indispensable. Without tridharma university & ASSET, no one country will be able to develop her economic potentiality.

Successful transfer and development of tridharma university & ASSET can only take place through the vehicle of consistently executed realistic and concrete programs of production which incorporate a systematic, step by step increase in the degree of comprehension and mastery of successively more sophisticated tridharma university & ASSET. Only through these kinds of progressive manufacturing plans can a society develop itself into a productive power and hence a credible and respected member of the family of nations existing in the world today and in the future.

Tridharma university & ASSET Policies. The policies on tridharma university and on ASSET shall be directed toward developing national capabilities in ASSET as necessary for the national development in accordance with the needs and priorities of national development. The global policy on tridharma university of ASSET can in broad outlines reach their targets, when the definite R&D of ASSET programs can be implemented according to plan.

However, it will still be necessary to study and formulate the tridharma university and ASSET programs, to achieve a convergence between the plans and the results we hope for. Special attention must be given to the following: 1). Inter-institutional coordination and interaction, and particularly the optimal distribution and utilization of the available information on tridharma university and ASSET. 2). The provision of funds and of skilled staff in accordance with the tridharma university, whereby the development and participation of the regions in accordance with the development and participation of the regions in accordance with the development conditions must be further increased. 3). Proper inducements and remuneration for university staff who show superior performance, must be planned and formulated as a policy which shall be increasingly introduced in our society. 4). Supportive policies are also needed to distribute and popularize the modus operandi for tridharma university transfer from overseas, through involving national manpower and materials, in a programmed, systematic, and effectively phased program. 5). In taking benefit of foreign tridharma university capacities through bilateral, regional or multilateral cooperation, a mutually beneficial institutional must be pursued. 6). In determining the objectives of the tridharma university programs, the results and utilization should be institutionalized harmoniously in stages. This is appropriate, as the development of tridharma university has been funded from taxes and other government revenues
raised by the community, and therefore the interests of the community should be given proper attention.

**Relations between industry and university.** A good vision for the university-industries cooperation should have some distinctive features including the followings: 1). Innovative and future-oriented. 2). Utopian enough to lead to a clearly better future for the organization. 3). Fitting in with the organization’s culture, values and history. 4). Reaching out for new dimensions. 5). Setting standards of excellence and reflecting high ideals and aspirations. 6). Clarifying purpose and direction, including measurable objectives. 7). Inspiring enthusiasm and encouraging commitment. 8). Reflecting the uniqueness of the organization, its identity and core competencies

Industry can get the following advantage from its cooperation with research institutions: 1). A redefinition of industry’s role, causing it to be increasingly oriented towards need and demand. 2). Consultation and counseling services on industrial property laws, design and development of products, quality control and suchlike. 3). Testing facilities. 4). Assistance in negotiations with projects and equipment suppliers. 5). Economic forecasting. 6). Exchange of tridharma university information. 7). Establishing communications with overseas universities, etc.

The factors, which encourage cooperation between the research institution, the universities and industrial world include: 1). The improvement of communication lines, contributing to better harmony between resources and needs. 2). The involvement and responsibility of personnel, supported by a satisfactory remuneration system. 3). The mobility of personnel between the research institutions, the universities and the industrial world. 4). The beneficial effect of the development projects.

**CONCLUSION**

It can be concluded that : 1). The development of tridharma university and ASSET, represent forces that strongly affect man, life and civilization. 2). Without tridharma university and ASSET, no one country will be able to develop her economic potentiality. 3). The policies on tridharma university and ASSET shall be directed toward developing national capabilities in ASSET as necessary for the national development in accordance with the needs and priorities of national development. 4). The spirit of the cooperation among scientists/academics inter - universities should very high. 5). The exchange programmers are very useful for scientists, academics and engineers in order to discuss and share the latest development in tridharma university and ASSET. 6). The New/Renewable Energy is one most important issue for our life today. Therefore tridharma university and ASSET must utilized for developing New/Renewable at all stage development and activities in every field : Education Institutes, Research Institutes, Government Institutes, Business Institutes and Industrial Institutes. 7). Energy Sources in the future are : Wind Power, Water Power (Tides, Ocean Currents, Ocean Waves, Ocean Thermal Gradients), Geothermal Power, Solar Power and Biomass Power. 8). Tridharma university in developed countries for development new ASSET, but in developing countries tridharma university mostly only for importation and utilization of ASSET.

**REFERENCES**


