

PRODUCTION CAPACITY DEVELOPMENT OF SMEs THROUGH INFRASTRUCTURE DEVELOPMENT, R&D AND HRD. ¹

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Introduction.

The financial and economic crisis started 1997, SMEs has gained significant recognition due to its capacity in providing employment opportunities for the displaced workers from the collapse of many big enterprises. The Government and many other national and international institutions look at important role of SMEs in job creation/providing employment opportunities. Government institutions and the donor institutions national and international, are willing to provide assistant to promote enlarging its capacities to reduce unemployment, role in poverty alleviation, income generating capabilities, as media of the distribution of income. Type of assistant varies from providing funding support, training opportunities, technical assistance, transfer technology, product design, utilization of information communication technology and other types of assistance, relates to promote improvement of SMEs performances.

As regards to SMEs, especially in developing countries, small enterprises include in it is micro enterprises. Micro enterprises which by definition is the business entity employing 1-4 employee (Indonesia), international institution such as donor agencies adopt definition that the maximum employee of micro enterprise is 10 personnel. Within the group of micro enterprises, majority of them are belong to non formal entity (non legalized enterprise). Micro enterprise in many cases is called as self employment or as home business since the business is done by only one person (the owner) or any activity is done at home.

Although micro enterprises role to accommodate the negative impact of the crisis is recognized in providing employment opportunities, income generating activities, poverty alleviation etc, but the product quality out put of micro enterprises in average is low, the added value is relatively low and the average level of productivity is lower compared to the medium as well as big enterprises. Why is this happened. This is due to the common weaknesses within most of the micro enterprises, namely : limited capability of human

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resources (refer to average level of education and skill), limited capital/limited access to financial sources, poor hygienic of work place, less access to better technology, low product quality, limited skill in business and financial management. Therefore micro enterprises get difficulty to enlarge its market except within local market. The following is describing the ideas how to develop strong and competitive Small Enterprises.

Problems of SMEs and Poverty (in rural areas)

Prior to elaborate how to make SMEs stronger, competitive and improve its production capacity it is wise we look to its obstacle and constraint. Within small enterprises, bulk of them are belong to group of micro enterprises (approximately around 90%), majority of them are exist in rural areas.

Problems in relation to SMEs and poverty in rural areas are too many and complicated, however by classification and simplification, the problems can be presented in simple way. In this context the problems is presented briefly as the following:

The *internal* common problems within most of SMEs relates to production and distribution factors, those are supply of raw materials/supporting materials, condition of work place, lack of skill workers/low level of production technologies, limited capital, product marketing and business management.

Materials and supporting materials, SMEs, especially small enterprises has little capability in planning and managing supply of raw materials/supporting materials so that SMEs is facing difficulties in responding price and supply instability. Agricultural sector as dominant business unit in rural areas get difficulty to obtain and responding price fluctuation of seeding. Although government have given support and subsidy to buy fertilizer as an example, but in reality/practically the subsidy has gone away due to shortage of supply of fertilizer. This condition push the price of fertilizer up, it create inefficiency (high cost economy) in production cost on farmers side and it gives effect to reduce competitiveness of the agricultural commodity.

Workforce, limited skill, education and experiences of the workforce, influence the quality and productivity mainly in agriculture and small industry sectors as majority business entity in rural areas. It is almost no program in systematic planning and sustainable to improve the capability and skill of the worker in agriculture and small industry in rural areas, issued and continually implemented by the government and private institutions. At

present only very few extension workers available in rural areas as compared to period before crisis (in case of Indonesia).

Technology, SMEs in average is regarded weak in practicing better technology and unaware of the importance of S&T utilization in their business affairs. Here, technology include hard and soft technology. The role of technology is strategically important for SMEs, especially to improve productivity, increase production capacity and quality of the product as well as better access to market information. S&T institutions such as research and development (R&D) institute and university mostly located in the cities and it is not integrated in network of the small enterprise affairs and it is not clear on the mechanism how to transfer product of R&D to small enterprises in rural areas. R&D institution and SMEs have different orientation, R&D institute oriented knowledge product while SMEs oriented on profit, to match both organization, need special arrangement. Further more, almost none intermediary organization/institution to take care of technology transfer into rural areas. There is a big gap exist between S&T establishment and small enterprises development efforts. Therefore this condition is partly effecting to less utilization of S&T products achieved by R&D institutions for the benefit of small enterprises (in rural areas). This situation bring the small enterprises lack behind on the benefit of using better technology to improve performance of their business, it contribute to trap most of them in poverty condition due to inefficient and less competitiveness in doing their business.

Capital; In average small enterprises in rural areas have limited fund in running their business and limited access to get funding support. Although government have already provided credit scheme for small enterprises, the requirement to get the fund through the bank (as prudential bank) is difficult to be fulfilled by small enterprises. It is especially in providing collateral and submission of credit proposal containing plan of utilization of credit fund and feasibility study. Recently government (Indonesia) launch credit scheme without collateral (PNPM – National Program for Community Empowerment) for small enterprises, it is yet to be observed on the acceptance of this facilitation by small enterprises. In addition facilitation of credit scheme that give low interest rate is given by the government through state enterprises which it provide 1 - 5% of its profit to support the development of small enterprises and cooperatives (Wiranta, 2003). *Marketing*; marketing capabilities of small enterprises in general is limited to specific consumers that need the product. Small enterprises mostly have no capability to do

marketing dynamically and by planning to gain market share which is intended. It is as well, small enterprises is lack of capability to process market information into production planning. Within agriculture sector relate to food products, this sector is the main sources of poverty. Problems of marketing is quite dominant as the cause of relatively low income received by the farmers in this sectors. Agricultural product of this sector is inelastic in character due to easily rotten product and during the harvest period, the price of these commodity tend to drop significantly. Another problems is the distribution support and marketing infrastructure of agricultural products. This infrastructure in rural areas is quite minimal, it gives effect to farmers income, farmers become dependent to /under local mediator control since this broker is then controlling the market of the commodities. Pricing policies on agricultural products especially on paddy grain/rice is not profitable to the farmers, this keep small farmers (including landless farmers) trap in poverty circle.

Management; managerial capability of small farmers is also generally weak. Small farmers in agriculture run its business in relatively simple way, neglecting planning, data recording, do not make arrangement to meet the target and optimal achievement which is intended. Any action is done according to existing capability/capacity without systematic efforts to improve the out put. External problems of small enterprises include market behavior, change of consumer taste, infrastructure, partnerships, government policies, influence of globalization etc. Small enterprises could not escape from this external problems, it will contribute to the drawback of the small enterprises/small farmers. The above weaknesses of small enterprises/small farmers in rural areas (which is mainly are from agriculture sectors), contribute significantly to poverty condition of communities in rural areas since majority of them belong to this sector.

Comment to government policies on the poverty reduction that so far had been implemented are: the policies had been implemented as a crash program, mostly *charity* in character, minimal content of technology, non productive oriented, temporary, the program was not oriented to sustainability and lack of formation of local institutions to keep sustainability.

Infrastructure development to enhance production capacity of SMEs

Law and regulation (as soft infrastructure), it should emphasizing on promoting capacity development of small enterprises and to prevent the small enterprises to compete head to

head with medium and large enterprises. Instead, this law and regulation have to drive partnership of both small and medium/large enterprises in the spirit of mutual benefit. This is expected can be materialized through regulation to adopt method of cluster formation of specific sector of commodity and standardization of commodity products. The medium/large enterprises having function to assist small enterprises to produce items as required by the standard. Government is required to provide the necessary facilities and funding to upgrade man power capability through building up professional vocational training and technical high schools, on specific skill. It is also neede to enhance facilities through provision of loan to by more update equipment/machineries to enable SMEs produce product as required by the standard. Organization such as BDS should be able to give services in management of the cluster. All interaction among the players should be based on business, not charity.

Business and technology Incubator(including technology park); establishment of this kind of incubator is indeed needed in order to accelerate the transfer of knowledge/technology and transformation of technology as well as to improve/enhance the degree of innovation. To achieve that intended results, the incubator would be best to be attached to S&T establishment such as universities or R&D&E institutions. In many countries the development of incubators under universities/R&D&E institutes supervision is quite common. It is on going and it have many benefits for the parties involve. In Indonesia a few universities have build up business or technology incubators such as Bogor Institute of Agriculture (IPB), UNS – Surakarta and in some other university and R&D&E institution such as BPPT (business/technology incubator) and LIPI (technology incubator) but it is still on limited scale of their operation.

Partnership of SMEs,,universities and R&D&E Institutions; Science and technology institutions through its capability and long experiences of doing research and engineering activities is believed to have many research/engineering results that probably can be of beneficial to enhance the production capacity of SMEs, in many sectors of products. It is as well to utilize its technology/knowledge on high tech to increase the productivity or competitiveness of SMEs products. Currently many countries is practicing to support their SMEs with high tech achievement in biotechnology, nano technology to enhance product quality and increase productivity in order to improve competitiveness in market and bringing more growth to economy to the country.

Through this partnership program, the S&T establishment will get benefit through their scientists and engineers, they will be more familiar with real problems exist within SMEs and how to match research/engineering goals to produce better economic value (to introduce technology/business innovation).

The detail mechanism of partnership should be put in the formal contract agreement to guarantee that both parties comply with its duties and responsibilities/ obligation. To get funding support to finance the activities of the program both personnel from S&T institute and SMEs involve in formulating the proposal. This is to ensure that SMEs is indeed need the content of the activity for their benefit and fully understand its duties and responsibilities. The content of the proposal emphasizing on introducing technology to increase capacity and productivity of SMEs, better quality of the product out put, business feasibility and formation of local institution, and technical assistant by S&T establishment. Funding support of this program is possible coming from the government sources or from private sector and donor agencies. Sustainability and increase of SMEs asset is part of criteria of success of the activity of the partnership program. More elaborate scheme see annex.

Information communication technology(ICT),, new trend on doing business utilizing ICT, outsourcing and networking strategy is adopted by medium, large enterprises and multinational companies (MNCs) require SMEs to undertake proactive measures to ensure sustainability of their business (J. Techacharm, 2005). Now is in 2009, the technology is much more establish, easier to use, and price of hardware is getting cheaper. However, as majority of small enterprises in developing countries are micro enterprises with so many obstacles and constraints, this infrastructure could not yet beneficial to majority of small enterprises, but to some, it can enhance their marketing capacity and doing their business. It is a big challenge to government of individual country to respond to empower small enterprises to get familiar to utilize the opportunity to promote competitiveness and maintain their sustainability. It is necessary to have clear and comprehensive plan on this matter (government role). There are several action to be taken to overcome the constraint on using ICT for e- business especially on the adequacy of ICT infrastructure and facilities, training program for the prospective small enterprises that have willingness to modernize

their business, legal and regulation to ensure the security of e- transaction, to create effective and efficient delivery and distribution system, availability of necessary basic equipment that is affordable to SMEs (avoiding heavy burden to SMEs) to take benefit of using ICT for their business.

Public policies; as regards to SMEs problems to enhance its capacity/productivity, there are several stages of public policies to be taken (Ikhsan M, 2005). First, group of public policies to open widely the business prospect, to eliminate discrimination, and to push formalization of SMEs. Second, group of public policies at enterprises level, it is directed to strengthen the specialization and to establish partnership between small enterprises and big enterprises. Third, group of public policies which its objectives is to empower selective group of SMEs in order to minimize possibility of distortion as regard to resource allocation.

The above public policies contain two important aspects. One is the improvement of investment climate and second is to eliminate discrimination to SMEs due to market mechanism. The investment climate consist of three element: 1) policies that influence cost (e.g. tax, red tape, corruption, etc.), 2) condition that influence risk, such as macroeconomic stability, consistency and predictability of policies, property right, contract enforcement, and the right to transfer profits, 3) obstacles on competition namely regulation to join in and out of the business, financial market and infrastructure is well functioning and existence of effective law on competition.

Policies at enterprises level relate to partnership of small enterprises and big enterprises. In some cases production process of some components is more efficient if it is done by SMEs than it is done by big enterprises. As regard pushing partnership between SMEs and big enterprises, it should follow of win-win solution. These are: 1) the partnership is to facilitate but not to replace transaction between enterprises, 2) to reduce risk of transaction cost, 3) to build the capability and capacity of SMEs side, 4) It is not a social program but it is as economic needs of both parties involve in partnership.

Physical infrastructures; physical infrastructures such as network of good and reliable land/sea/air transportation will have great effect on building up production capacity of SMEs. It is as well on the existence of reliable and sufficient electricity and energy/water supply, good and reliable information communication technology system. Without these reliable infrastructures, enhancement of production capacity would not have any meaning

to business affairs of SMEs as well as big enterprises. Competitiveness to attract investors is also depend heavily on this readiness of these infrastructures. In these matters the government/public authority role is dominant due to its high investment characteristic as well as services function to communities of public authority. Example of this, is the attractiveness to the investors to invest in Jawa compare to other island. It is due to availability of better infrastructures relatively to what is available in other islands. It is indirectly will also attract more skilled/educated people to choose to work in Jawa.

Human resource development and production capacity of SMEs.

What is really needed in human resources development to improve production capacity of SMEs? As regards human resources of SMEs especially small enterprises we indicate several weaknesses. First, average level of education and skill of players in small enterprises is limited, except thin layer of players in small enterprises has good qualification in education and skill and ready to enter the business competition (they mostly exist in cities). This small layer of players is able to promote their own capability/capacity and innovation. Less intervention needed by this group of players. So, what about the rest of small enterprises players as regard to promote their production capacity (this layer is about 90% of total enterprises, according to many survey in developing countries). *Grameen Bank scheme*, as an example, introduce means to enhance production capacity of mikro enterprises, such as provision of simple productive equipment to replace manual process, on loan based and guarantee market of the products. During loan period agent of the bank give training on operation and maintenance of the equipment. When the loan has been paid back, then the recipient will own better production means to improve their income (the recipient of the loan mostly are women). Another example, some countries create *training centers to cater community development*. This centers transferring knowledge, skill training for the communities (at community training centers). This community training centers in most country is managed by the government. Alumni of this training centers when later he/she enter small enterprise or business they already have basic skill/knowledge to work. If this training centers able to accommodate large number of peoples, this facilitation will bring SMEs to get better opportunity to choose better quality of manpower and to improve its production capacity. Another means to be considered is the establishment of sufficient numbers of *vocational training* that have qualified

instructors and sufficient equipment and other educational infrastructures. Each vocational training has specialization on subjects matters as regard of location where they are. This is related to specific needs of skill and technology that most required in the location and its surrounding areas. If the location is surrounded by industrial areas, vocational training should focus on providing skilled manpower as needed by existing industries. However it is possible that skilled manpower provided through vocational training will create its own business (as small enterprises) or to work in existing small industry to supply things as requested by large industries. Other opportunity for these skilled manpower is to get job in small enterprises outside the areas. On this importance of vocational training in providing skilled manpower, public sector as well as private sector has to work together to build enough professional vocational training. *Extension workers* to assist promoting production capacity of SMEs could be another opportunity, this extension workers usually is provided by the government. If the extension workers are skilled workers they can contribute to enhance production capacity through direct training at enterprise level to the employees of SMEs. Problem will arise when it need fund to enhance production capacity. Therefore existence of services from micro financing organization in the area is really needed to help SMEs that need of quick funding support. When cluster modalities is adopt and implemented well, upgrading of human resources of SMEs would be easier to be materialized in more efficient way since they are in relatively close one to the other. In this case, training method and technology transfer method can be applied. For this purpose, the role of Business Development Services (BDS), Instructors from vocational training, extension workers and technical person from micro financing organization is needed. They are expected to be able to contribute to upgrade capability/capacity of employees of SMEs which will then improve productivity of the employees and it will be influencing better production capacity of SMEs. To make it to be realized, at initial state the government should be the main sponsor. As regard to technology transfer, there are two approaches of technology transfer: one is “technology push” that has the meaning transferring research results to industrial application, second is “market pull” that has the meaning to respond the request from the industrial sectors for problem solving capacities (Heinz Fiedler). In case of technology transfer to SMEs, due to initial condition of SMEs (micro enterprises) mention above, it is mostly the second approach is commonly happened, why? It is very long and costly way bringing research result to marketable product and from the product to

economic success, that mean profit (Heinz Friedler). For SMEs, option of first approach is probably unaffordable due to limited capital and risk capacity. Most of the existing transfer technology between SMEs and S&T establishment is more on engineering products to enhance production capacity than transferring research results.

Research activity and production capacity development of SMEs.

As business entity, orientation of SMEs is clear, making profit. SMEs with obstacles and constraint mention above, need ready and reliable technology/machineries and other means to help them to get benefit of their business. Meanwhile S&T establishment as generating knowledge/technology have their own way of doing work. The two establishment has to be bridged in order to have fruitful cooperation. In case of research to enhance production capacity of SMEs, our experiences of working on empowerment of SMEs, there are several research agenda/road map that should be formulated. Research agenda/road map such as technology of food and feed processing, packaging of food products, handling of agricultural products to reduce losses during transportation, techno economic feasibility, alternative funding system of SMEs, design product to meet consumers need, improve marketing capability of SMEs, needs on technology transfer to SMEs and alternative mechanism of technology transfer, etc. This research agenda (based on demand driven) is necessary for S&T establishment to run research activity that will give benefit to SMEs. The type of research should be more on applicative research than basic research. This research agenda would be able to bridge SMEs and S&T establishment to have fruitful cooperation. If this research agenda can be executed, the result is expected able to enhance production capacity of SMEs.

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ANNEX

IMPLEMENTATION OF TECHNOLOGY TO THE REGION (IPTEKDA)

Introduction.

At the time of economic crisis started 1998 SMEs (including micro economic enterprises, as majority) played important role to accommodate the displaced workers because of the collapse of many big companies. As regard to SMEs, internally they have chronic problems related to competitiveness (on average is low), very limited capital, backward in utilizing production technology, lack of creativity and innovation initiatives to compete in higher level business is relatively weak, less access to information. Therefore there are many problems which have to be solved/corrected.

Public policies as well as program of public institutions and research and development and engineering (R&D&E) institutions has to touch the fundamental problems as regards to SMEs especially to improve performance of SMEs. It is to avoid that policies formulation will bring SMEs always depending on government aids or subsidy. For that purpose, any public policies on empowerment of SMEs have to consider the fundamental problems of SMEs since SMEs is group of enterprises which are the biggest proportion ($\approx 99\%$) of the total enterprises in Indonesia. The number of people working in SMEs is larger than the people working for big companies and play significant role in national economy. Therefore it is worth to give attention and to support the development of SMEs. Indonesian institute of sciences (LIPI) as public institution feel responsible to take part and contribute in efforts aiming to empower and promote the competitiveness of SMEs through the program “Implementation of Technology to the Region” (Iptekda). This program is part of one of institute responsibilities to society. As national institute LIPI provide wide range of services to communities.

Iptekda program is formulated in innovative scheme. Its objectives is to empower/to enhance productivity and production capacity of SMEs through implementation of better technology (soft and hard) and to give facilitation as start up capital which have to be kept sustainable. The sustainability is meant that post activity by the program, it will bring multiplier effect to society and to enable empowering other SMEs in that region. Another aspect of Iptekda scheme is to consider the existing local potential commodities, as the supply sources of raw materials for SMEs. As regards implementation to the region,

Iptekda program consider taking benefit of the local expertise to join program activities by inviting local universities (public and private)/other higher education and R&D&E institute.

Through the strategic cooperation program involving LIPI and university/higher education and local R&D&E institution in the region, it is expected give optimal implementation and cost efficient activities due to closeness of activities to local S&T establishment.

To this extent, activities of Iptekda program are able to empower more than 60% of SMEs involve in the program to become productive and profitable enterprises and as provider of employment opportunity in the region. Furthermore, as regards Iptekda activities is based on science and technology, the program is also able to become one of accelerator of innovative activity in the region. This program is also able to be linked with goals set by *MDGs* on poverty eradication.

Currently most activities dealing with SMEs which is done by individual institution within the country are in the form of “ program” based, since no clear indication in law, regulation and policies to place development SMEs to be the backbone for Indonesia economic future.

Vision of the program.

Integrating science and technological capability, human resources, and capital to support enhancing SMEs competitiveness.

Mission of the program.

In order to reach what is mentioned in the vision, the mission set the activities as follow:

- To acquire technology and capability from R&D&E institutes, higher educations to promote SMEs capacity.
- To bridge the cooperation SMEs and S&T establishment in the spirit of mutual benefit.
- To push strengthening the SMEs which have productive activities.
- To provide fund (as revolving fund) to buy needed machineries to enhance production capacity as needed by SMEs.
- To establish institution at the region which task is to manage fund and sustainability of the activity in the region.

- To give priorities to the activity that use as much as possible local commodities/available at domestic market.
- To select SMEs which have future business prospect, provide technical assistance/training/input of technology.

Development objectives.

The objective of operating Iptekda program is the following:

- To utilize S&T research capability to upgrade technology /economy of SMEs and creation of new job opportunity.
- To strengthen SMEs competitiveness through introduction of technology, skill training in technology, assistance in management, provision of limited capital input.
- To make SMEs more dynamics to follow the technological development for the benefit and sustainability of their business.
- To bridge interaction of R&D&E institution/university/other S&T establishment with business/industry establishment.

Targets of the program.

- Existence of SMEs with better economic scale, more update in technology and management.
- Realization of better quality of human resources/products and business/industry sustainability, new job opportunities.
- Intensive interaction of SMEs and S&T establishment.
- Existence of proven alternative SMEs empowerment model.

Criterion of activities.

The activities of Iptekda program have to follow on condition that:

- Activity should be connected with production or services.
- Business have prospect to grow and able to compete in the market.
- Improve added value of main product/specific product of the region.
- Expertise of main executor should have connection with subject of the activity and the activity should be within institutional competencies which responsible of the activity.
- Activity which have connection with production: a) Implementation of S&T to enhance productivity/product quality have to get agreement of SMEs, b)

Implementation of production process technology/improvement of product quality/ efficient use of energy/maturing product, should go through incubator.

Measure of successful activity

Valuation of success of the activity is based on:

Planning;

- Technology/training is needed by respective business (written statement).
- Availability of personnel to run the activity and a guarantee of raw materials supply.
- Market information is accurate so that product out put of the activity can fill in the market opportunity.
- Technology input is already well tested/reliable and the training module is well prepared.
- It shows good technical/economic feasibility.

Execution,

- The respective business is sustainable. Technology/training it is used in routine production activity, asset of business unit increase, better quality product, larger market share, wages of the labor increase.
- There is increase of the employee at business unit and the execution is as planned in planning state.
- Intermediary organization functioning as intended of Iptekda scheme.

Post financing by Iptekda program.

- Business unit is sustainable, to get profit, any increase of employee.
- Business unit is able to fullfil its responsibility as written in contract agreement to intermediary organization.

General policies,

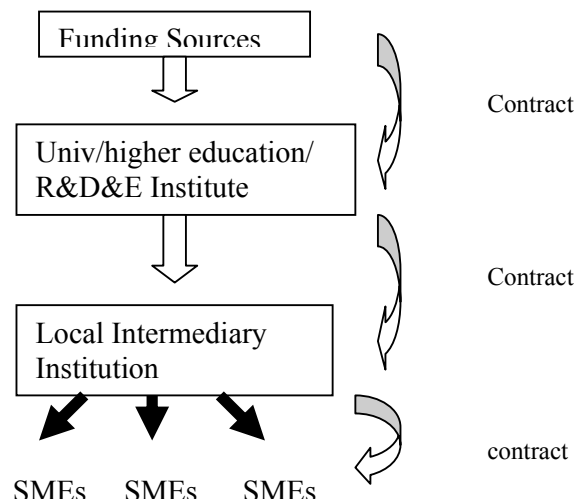
- To create local legal institution to manage the revolving fund. Area coordinator and field coordinator include as part of personnel of the institution.
- Technology introduced to SMEs should be reliable and produce sellable product.
- To give priority to SMEs that produce income generating activity.

- To take benefit and develop specific local commodity.
- To cooperate with local government in implementing the activity.

Expected out put,

The expected out put of the program : stronger and more competitive SMEs and sustainable in their business. SMEs can pay back the facilitation they received from the program (equipment, machineries). The local intermediary institution will manage the fund for further empowerment activity.

Mechanism used in Iptekda program (in brief)



Role of S&T establishment is to formulate proposal (together wih SMEs) and to give technical assistant to local intermediary institution to implement the activity. In longer term , activity will be manage by local institution with supervision by field coordinator.

Fund for SMEs is mainly to purchase machineries and other equipment to promote production capacity, only small amount to buy materials for production.

Activity of Iptekda Program 1998 - 2004

Year	Iptekda	Number of program	Number of Activity	Number of SMEs	Island
1998	I	12	50	730	Jawa, Kalimantan, sulawesi, nusa tenggara, sumatra
1999	II	58	68	950	jawa, sumatra, nusa tenggara, papua, sulawesi
2000	III	47	54	750	Jawa, sumatra, kalimantan, sulawesi, papua, Ns tenggara
2001	IV	46	51	710	Sumatra, jawa, kalimantan, sulawesi, nusa tenggara.
2002	V	52	60	840	Sumatra, jawa, sulawesi, nusa tenggara.
2003	VI	53	56	770	Sumatra, jawa, bali, nusa tenggara, kalimantan, sulawesi
2004	VII	49	51	450	Sumatra, jawa, sulawesi, nusa tenggara.

Economic sector of Iptekda program activities,

Agriculture (including fishery, cattle farming); Food processing industry; Feed processing industry; Handicraft (batik, furniture, cukli, bamboo, mirror).

Progam Evaluation,

The survey was done to evaluate implementation of Iptekda program 1998 – 2004. During the period 1998 – 2004 Iptekda program was able to provide 3.542 job opportunities in the location of the activities. As regards to survival rate of the Iptekda program activities the number shows 67.7%, 31% of activities its asset is even growing (P₂E, 2005).

Data from the same survey show that Invers ICOR of activity in West Nusa Tenggara have the highest value, 15.1 and the lowest value is the activity in South East Sulawesi, 3.1. Industries in west nusatenggara are pottery industries, pearl industries and handicraft industries (cukli). In west nusa tenggara Iptekda program provided : production equipment, prouct design, computer and introducing internet for marketing to sell the product abroad. It is a success effort. The SMEs is able to sell at better prices, for example before Iptekda intervention they sell the item Rp 5.000, after the intervention they can sell it Rp 90.000 (equivalent US\$ 10) abroad (export). Input of technology can create more benefit.

EXAMPLES OF IPTEKDA ACTIVITIES IN PHOTOS



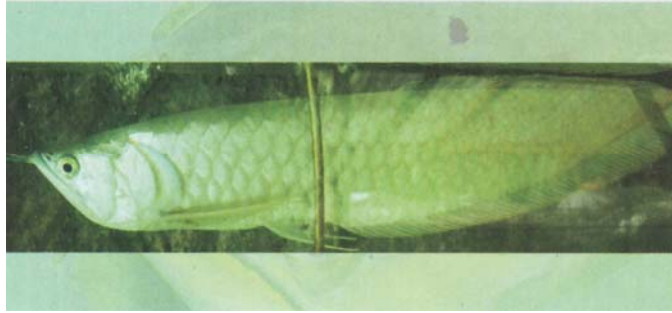
Kerapu fish culture at Situbondo, east jawa



Fishing boat, Mataram, west nusa tenggara.



King grass for cattle feed



Arwana fish breeding



Smoke fish process



Oven vacuum dryer for sea weed



Sea weed



Vacuum filtration for seaweed processing



Wood Handicraft (input product design)



Batik handicraft



Workers at cukli production center



Cukli product, Mataram