

**JBIC ODA Loan Projects: Ex-Post Monitoring Report**

Project Title: Indonesia “Science and Technology Manpower Development Program”

**[Outline of Loan Agreement]**

Loan Amount/Disbursed Amount : 6,067 million yen / 5,731 million yen  
 Loan Agreement : October 1988  
 Final Disbursement Date : November 1997  
 Ex-post Evaluation : 2000  
 Executing Agency : Agency for the Assessment and Application of Technology (BPPT)

**[Project Objective]**

This project’s objective was to develop skills in science and technology among the personnel of six government agencies\* operating in this sector through foreign study at the college and university level and short-term training programs, thereby raising scientific and technological competence in Indonesia and contributing to efforts to promote economic growth.

\* The six government agencies: BAKOSURTANAL (National Coordinating Agency for Surveys & Mapping), BATAN (National Nuclear Energy Agency), BPPT (National Agency for the Assessment & Application of Technology), BPS (Central Bureau of Statistics), LAPAN (National Institute for Aeronautics & Space), LIPI (Indonesian Institute for Sciences)

**[Outline of Results] (Field Survey : December 2004)**

| Item  | Ex-post Evaluation (2001)   | Ex-post Monitoring  |                        |            |              |           |            |           |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
|---|---|---|------------------------|------------|--------------|-----------|------------|-----------|-------|------|------|------|------|------|------|------|------|------|------|-----------|----|----|---|----|----|------|----|------|-----------------|----|-----|----|-----|-----|------|-----|------|-------------------|----|-----|-----|-----|-------|------|----|------|---------------------|-----|-----|------|----|-----|------|----|------|--------------|------------|------------|------------|------------|--------------|-----------|------------|-----------|
| <p><b>[Effectiveness/Impacts]</b></p> <p>(1) Human resource development in the science and technology sector</p> <p>(2) Raise scientific and technological skills and promote industrial development</p>  | <p>(1)</p> <ul style="list-style-type: none"> <li>This project formed part of government plans to increase the number of people with academic qualifications in scientific and technological disciplines by approximately twelve thousand (8,360 in Indonesia, 3,842 overseas) between 1987 and 1995; 608 students (of which 256 to Japan) were sent overseas to study against a target of 400 (of which 240 to Japan).</li> <li>As of 1997, 90% (547 students) of the 608 students studying overseas had completed their programs of study and returned home.</li> <li>In the six agencies, as compared to 1989 (pre-project) 3.79 times more employees held doctorates, 3.63 times more held master’s degrees, and 1.67 times more bachelor’s degrees.</li> <li>Foreign study returnees have been reinstated in their original positions, and by and large, have either been promoted to a higher ranking position or are involved in more technologically specialized work.</li> </ul> <p>(2)</p> <ul style="list-style-type: none"> <li>In the questionnaire, many respondents stated that they “take pride in the fact that they are playing a key role in the socio-economic development of the nation, and are involved in promoting new industries or in resolving environmental issues.”</li> <li>It is essential to increase the levels of knowledge and technological skill throughout the nation through establishing a system for domestic skills transfer by making better use of foreign study returnees.</li> </ul> | <p>(1)</p> <ul style="list-style-type: none"> <li>A comparison of numbers holding university qualifications in the two agencies (BPPT and LAPAN) that provided data for 1988 and 2004 reveals that 3.8 times more employees hold doctorates, 3.6 times more hold master’s and 1.31 times more hold undergraduate degrees; i.e. the figures are basically identical to those obtained during the ex-post evaluation, confirming that the levels of scientific and technological knowledge are being maintained.</li> </ul> <p><b>Reference: Nos. of Foreign Study Returnees with Advanced Qualifications by Agency</b></p> <table border="1" data-bbox="1567 919 2712 1136"> <thead> <tr> <th rowspan="2">Academic Qualification</th> <th colspan="2">BPPT</th> <th colspan="2">LAPAN</th> <th>BPS</th> <th>BATAN</th> <th>BAKO</th> <th>LIPI</th> </tr> <tr> <th>1988</th> <th>2004</th> <th>1988</th> <th>2004</th> <th>2004</th> <th>2004</th> <th>2004</th> <th>2004</th> </tr> </thead> <tbody> <tr> <td>Doctorate</td> <td>12</td> <td>52</td> <td>7</td> <td>21</td> <td>20</td> <td>N.A.</td> <td>17</td> <td>N.A.</td> </tr> <tr> <td>Master’s Degree</td> <td>67</td> <td>162</td> <td>12</td> <td>122</td> <td>261</td> <td>N.A.</td> <td>103</td> <td>N.A.</td> </tr> <tr> <td>Bachelor’s Degree</td> <td>34</td> <td>116</td> <td>247</td> <td>254</td> <td>3,708</td> <td>N.A.</td> <td>55</td> <td>N.A.</td> </tr> <tr> <td>Short-term Training</td> <td>109</td> <td>282</td> <td>N.A.</td> <td>43</td> <td>523</td> <td>N.A.</td> <td>55</td> <td>N.A.</td> </tr> <tr> <td><b>Total</b></td> <td><b>222</b></td> <td><b>612</b></td> <td><b>266</b></td> <td><b>440</b></td> <td><b>4,512</b></td> <td><b>90</b></td> <td><b>230</b></td> <td><b>59</b></td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>At BPPT, 80% of published survey/research reports are written by foreign study returnees, which confirms the contribution these individuals are making to specialist fields of knowledge.</li> </ul> <p>(2)</p> <ul style="list-style-type: none"> <li>BATAN and LAPAN are using foreign study returnees to bolster collaborative studies/research with private-sector companies and foreign research institutes in all fields. These activities are contributing indirectly to furthering scientific and technological competence in Indonesia, which is in turn stimulating economic activity.</li> </ul> <p>Ex.) BATAN is collaborating with the national oil company and the Jakarta Nuclear Energy Research Institute.<br/>     LAPAN is involved with research organizations in Japan, India and Germany (in Japan: Research Institute for Sustainable Humanosphere (RISH) and Japan Aerospace Exploration Agency (JAXA) (1995-))</p> | Academic Qualification | BPPT       |              | LAPAN     |            | BPS       | BATAN | BAKO | LIPI | 1988 | 2004 | 1988 | 2004 | 2004 | 2004 | 2004 | 2004 | Doctorate | 12 | 52 | 7 | 21 | 20 | N.A. | 17 | N.A. | Master’s Degree | 67 | 162 | 12 | 122 | 261 | N.A. | 103 | N.A. | Bachelor’s Degree | 34 | 116 | 247 | 254 | 3,708 | N.A. | 55 | N.A. | Short-term Training | 109 | 282 | N.A. | 43 | 523 | N.A. | 55 | N.A. | <b>Total</b> | <b>222</b> | <b>612</b> | <b>266</b> | <b>440</b> | <b>4,512</b> | <b>90</b> | <b>230</b> | <b>59</b> |
| Academic Qualification  | BPPT  |   |                        | LAPAN      |              | BPS       | BATAN      | BAKO      | LIPI  |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
|   | 1988  | 2004  | 1988                   | 2004       | 2004         | 2004      | 2004       | 2004      |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| Doctorate   | 12  | 52  | 7                      | 21         | 20           | N.A.      | 17         | N.A.      |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| Master’s Degree   | 67  | 162   | 12                     | 122        | 261          | N.A.      | 103        | N.A.      |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| Bachelor’s Degree   | 34  | 116   | 247                    | 254        | 3,708        | N.A.      | 55         | N.A.      |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| Short-term Training   | 109   | 282   | N.A.                   | 43         | 523          | N.A.      | 55         | N.A.      |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| <b>Total</b>  | <b>222</b>  | <b>612</b>  | <b>266</b>             | <b>440</b> | <b>4,512</b> | <b>90</b> | <b>230</b> | <b>59</b> |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| <p><b>[Sustainability]</b></p> <p>(1) Sustainability of project effects</p>   | <p>(1)</p> <ul style="list-style-type: none"> <li>Findings from the interview survey reveal that the foreign study returnees are engaged in work that utilizes the various knowledge/skills that they acquired overseas.</li> <li>It was not possible to ascertain the level of satisfaction with pay rewards, but respondents generally evaluated their work environments, etc. highly.</li> <li>There were fears of a brain drain once the mandatory period of employment upon return from foreign study had expired, but all foreign study returnees are currently employed in government agencies.</li> </ul>   | <p>(1)</p> <ul style="list-style-type: none"> <li>With the exclusion of BATAN and LAPAN, 90% of foreign study returnees are still working for their original employers (although this also includes those who studied overseas under other programs). However, 20% of foreign study returnees at BATAN (28 people) and 30% at LAPAN (48 people) are now working in the private sector.</li> <li>The Indonesian Government evolved this project into Human Resources Development Program expanding its target also to administration or economic sectors.</li> <li>Since the project was implemented there have been changes in the sciences and technologies needed for industrial development in Indonesia and this is generating problems in terms of the treatment meted out to foreign study returnees and the budgetary measures being applied to the executing agencies.</li> </ul>   |                        |            |              |           |            |           |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |
| <p><b>[Lessons learned and recommendations; reference information and monitoring methods]</b></p> <p>(1) Follow up on the lessons learned/ recommendations detailed in the ex-post evaluation report and the SAPS (Special Assistance for Project Sustainability) that was subsequently implemented</p> | <p>(1)</p> <ul style="list-style-type: none"> <li>To avoid a brain drain, it is important to provide follow-up for foreign study returnees, including better treatment in the work place, the provision of counseling services and so forth.</li> <li>Technical transfer within Indonesia of the technical skills, knowledge and expertise of foreign study returnees will help to ensure the sustainability of educational effects.</li> </ul>   | <p>(1)</p> <ul style="list-style-type: none"> <li>Although many students who studies abroad are not satisfied with the present level of salary, all agencies are offering counseling services to them on their future career paths, etc., when appropriate.</li> <li>All agencies are holding seminars in conjunction with other government agencies and businesses and conducting collaborative research in the work place as a means of passing on the knowledge acquired by foreign student returnees.</li> </ul>  |                        |            |              |           |            |           |       |      |      |      |      |      |      |      |      |      |      |           |    |    |   |    |    |      |    |      |                 |    |     |    |     |     |      |     |      |                   |    |     |     |     |       |      |    |      |                     |     |     |      |    |     |      |    |      |              |            |            |            |            |              |           |            |           |

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| <p>(2) Lessons learned during ex-post monitoring and recommendations for sustainability</p> |  | <p>(2)</p> <ul style="list-style-type: none"><li>• Now that Indonesia is emerging from the economic confusion that followed the Asian currency crisis and the political situation has stabilized, the country needs to begin reemphasizing the development of human resources with cutting-edge scientific and technological skills.</li><li>• For future programs, every effort must be made to select fields that will follow the pattern of industrial development.</li></ul> |
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