Republic of Indonesia

Road Rehabilitation Project (II)

Report Date : February 2002

Field Survey : July 2001

1. Project Profile and Japan's ODA Loan

Project Location Map

Bandung - Semedang

1.1 Background

The government of Indonesia has developed its national road network since the 1970s in order to cope with increasing traffic demand as well as to support the rapidly growing Indonesian economy. While the number of roads has been sufficient, their condition had gradually deteriorated because of insufficient budget allocations for maintenance. The government of Indonesia therefore reviewed and changed its road development policy to give higher priority to the maintenance of existing roads. Prior to this project, the first phase of JBIC-financed Road Rehabilitation Project had been implemented for the roads in nine provinces in Sumatra and West Java.

The second phase of Road Rehabilitation Project (this project) was designed for some deteriorated sections in urgent need of rehabilitation. All were on the same route with, or extensions of, sections repaired in Phase I.

1.2 Objectives

The objectives were to rehabilitate/upgrade the regional trunk roads in Sumatra and West Java, which had been heavily damaged by rapid growth in traffic, in order to improve transport efficiency, and to promote agricultural and industrial development in the corresponding regions.

1.3 Project Scope

(1) Road Rehabilitation/Betterment work on regional trunk roads in nine provinces: D.I.Aceh, North Sumatra, West Sumatra, Riau, Jambi, Baengkulu, South Sumatra, Lampung, and West Java.

(2) Consulting services for supervision of the above works.

1.4 Borrower/Executing Agency

The Republic of Indonesia/Directorate General of Highways (BINA MARGA), Ministry of Public Works (* the executing agency at the time of appraisal)

1.5 Outline of Loan Agreement

Loan Amount Loan Disbursed Amount	21,040 million yen 20,087 million yen
Exchange of Note Loan Agreement	December 1989 December 1989
Terms and Conditions Interest Rate Repayment Period (Grace Period) Procurement	 2.5 % p.a. 30years (10years) General Untied (Partially Untied for Consulting Services)
Final Disbursement Date	December 1994

2. Results and Evaluation

2.1 Relevance

Since the 1970s, the Government of Indonesia has developed a network of trunk roads, placing a high priority on promoting economic growth, and this road network has become one of the most important components of the infrastructure supporting the Indonesian economy. Most of the trunk roads, however, had deteriorated because of inadequate maintenance, resulting in transport system inefficiencies and an increased risk of traffic accidents. At the time of appraisal, the main emphasis of the road development plan in Repelita V, the Fifth Five Year National Development Plan (1989-1993), was on rehabilitating and maintaining existing facilities, rather than on new construction, a reflection of the above situation. This policy has been sustained in the current National Development Program (PROPENAS)(2000 – 2004).

As the second phase of the Road Rehabilitation Project, this project was expected to rehabilitate or upgrade selected sections of regional trunk roads in Sumatra and West Java that were closely related to the sections covered by Phase I, in order to improve their transport efficiency. The project was relevant at the time of appraisal and it remains relevant since it was, and is still, consistent with the then and current national development programmes.

2.2 Efficiency

(2.2.1) Project Scope

National or provincial roads in the nine provinces in Sumatra and West Java were selected for the project based on following criteria:

- The EIRR of the project road should be more than 15%.
- Project roads should be those contributing to socio-economic development or those promoting efficient transport between remote areas and urban centers.
- The project aim should be either the improvement or periodic maintenance of existing roads.

At the time of the project appraisal, the original scope was to improve and to rehabilitate a total length of 1,921 km of roads, while the actual scope was reduced slightly to 1,890 km. This reduction was the result of increased costs. Erosion and landslides during the 1.5 years from the appraisal in September 1989 to the start of actual implementation in January 1991 led to further deterioration of the roads. As a result, the necessary rehabilitation costs grew, exceeding the initial budget; consequently, the actual scope was reduced. A 5-month delay of project startup as discussed in 2.2.2 accelerated the road damage. No critical inconvenience to traffic, however, has been reported on the sections dropped from the project scope.

(2.2.2) Implementation Schedule

While implementation of the project was originally scheduled for the period from August 1990 to October 1992, the project was actually implemented from January 1991 to November 1994, ending more than two years behind schedule. As much as four months were taken up with delays in the tendering procedure. The main reason for the construction started late was poor performance on the part of the three local contractors, which led to delays in the procurement of construction materials and in the preparation of equipment and manpower.

(2.2.3) Project Cost

The total project cost was estimated to be 24,754 million yen at the time of the project appraisal. Although there is no actual project cost data available, the executing agency has stated that there were no significant changes in the project cost in spite of the reduction in the project road length. Granted this is true, it implies that there has been a substantial cost overrun per unit length of actual works.

2.3 Effectiveness

(2.3.1) Traffic Growth

Table 1 shows traffic growth on the selected project roads in the provinces of South Sumatra and Lampung. The average growth rate of traffic volume on the selected roads between 1994 and 1995, right before and right after the project completion, was as high as over 20%, while it is impossible to theoretically examine to what extent this project contributed to this growth, as the annual growth rates before 1994 are not available. For reference, the annual growth rate of vehicle registration in the region was just 7.7% during the same period.

Table 1: Traffic Growth on the project roads

(Unit: veh/day)

Road Section	1994	1995	2000	Annual Growth Rate	
	Before Completion	After Completion		(1994-2000)	1994-1995
SOUTH SUMATRA					
Palembang–Kayu Agung	737	752	1,763	15.6%	2.0%
Meramjat–Kayu Agung	3,564	3,779	12,913	23.9%	6.0%
Muara Dua–Simpang Haji	1,519	1,569	1,956	1.3%	3.3%
LAMPUNG					
Ketapang–Gunung Labuan	2,015	2,674	3,346	8.8%	32.7%
Bandar Jaya–SP.Mataram	2,811	3,077	7,341	17.4%	9.5%
Gunung Sugih–Padang Ratu	2,882	3,541	4,043	5.8%	22.9%
Gedung Dalam–Sukadana	1,664	1,872	5,685	22.7%	12.5%
Metro–Kota Gajah	3,612	4,456	17,696	30.3%	23.4%
Jabung–Labuhan Maringgai	869	942	3,781	27.8%	8.4%
Gayam–Ketapang	2,110	2,728	7,417	23.3%	29.3%
Blambangan–Palas	2,241	3,610	4,348	11.7%	61.1%
Pringsemu–Bandungbaru	1,142	1,311	11,096	46.1%	14.8%
Total	25,166	30,311	81,385	-	-
Average Annual Growth Rate	-	-	-	20.4%	21.6%

Source: Dinas Bina Marga of South Sumatra, Lampung

(2.3.2) Travel Speed

Data from Lampung Province further show that average travel speed has increased owing to the road rehabilitation. Table 2 shows that immediately after project completion, traffic speeds increased to more than 60 km/hr from 40-50 km/hr. However, subsequent increases in traffic volume have allegedly lowered the average travel speeds again.

Table 2: Changes in Travel Speed on the Project Roads in Lampung

Road Section	Before the Rehabilitation/Betterment	After the Rehabilitation/Betterment
Ketapang–Gunung Labuan	30–40 km/hr	60 km/h
Bandar Jaya–SP.Mataram	40 km/h	60–70 km/h
Gunung Sugih–Padang Ratu	40–50 km/h	70–80 km/h
Gedung Dalam–Sukadana	50 km/h	70–80 km/h
Metro–Kota Gajah	50 km/h	60–70 km/h
Jabung–Labuhan Maringgai	40–50 km/h	60 km/h
Gayam–Ketapang	40 km/h	60 km/h
Blambangan–Palas	40 km/h	60 km/h
Pringsemu–Bandungbaru	50 km/h	60–70 km/h

Source: Dinas Bina Marga of Lampung

(2.3.3) EIRR

An EIRR of more than 15% was one of the selection criteria for project roads at the time of the project appraisal. The EIRR was re-estimated by the executing agency after project completion. The re-estimated EIRR of each project section exceeds 15% without exception. The average EIRR is 34.5% for all project road sections, which shows sufficiently high returns. The

figure is, however, slightly lower than expected at the time of the project appraisal, presumably resulted from the subtle cost overrun, according to the executing agency.

2.4 Impact

As positive impacts of the project, the following were expected at the time of project appraisal:

a. Promotion of development of local industries
b. Promotion of export or production of non-oil products

(2.4.1) Agricultural Production

Agricultural production in the project provinces has generally attained a higher growth rate than in other regions. For example, the growth rate in the provinces of South Sumatra and Bengkulu was 3% to 6% per annum during the years from 1994 to 1999, while the growth rate for the overall country was 1.6% per annum. The project was supposed to support the growth of agricultural production by facilitating transport to and from rural areas. Growth rates for the provinces of Riau, Jambi and West Java were lower than the national average. In the cases of Riau and Jambi, the length was too short to be a contributing factor. In West Java, agricultural land has actually been decreasing from its utmost in 1995 as a result of urbanization.

Table 3: Annual Growth Rate of Agricultural Production

(Unit: million ton)

PROVINCE	1994 Year of Completion	1999	Annual Growth Rate
ACEH	1,329,536	1,478,789	2.1%
NORTH SUMATRA	3,079,960	3,333,377	1.6%
WEST SUMATRA	1,747,543	1,855,558	1.2%
RIAU	445,361	458,531	0.6%
JAMBI	564,722	571,147	0.2%
BENGKULU	334,232	381,745	2.7%
SOUTH SUMATRA	1,347,611	1,777,122	5.7%
LAMPUNG	1,615,751	1,797,023	2.1%
WEST JAVA	9,860,375	10,000,038	0.3%
INDONESIA	46,641,524	50,401,783	1.6%

Source: Statistical Yearbook Indonesia

(2.4.2) Production of Non-oil Products

The production of non-oil products can be examined using the GRDP, excluding oil and gas, as shown in Table 4. Except for West Java province, GRDP, excluding oil and gas, for all the provinces with project roads grew at 2.4 % - 6.1 % per annum during the years from 1994 to 1998, compared to the national average of 1.6%. The project was supposed to contribute to the production increase, though it is difficult to figure out the degree of this contribution. In the case of West Java, where until 1997 the growth rate was higher than that of the national average, the

low growth rate might be attributed to the economic recession from of 1997-98.

Table 4: GRDP [Without Oil and Gas]

(at 1993 constant prices: million rupiahs)

PROVINCE	1994 Year of Completion	1998	Annual Growth Rate
ACEH	5,295,000	6,142,012	3.8%
NORTH SUMATRA	19,524,000	21,928,695	2.9%
WEST SUMATRA	6,476,000	7,488,442	3.7%
RIAU	6,616,000	8,394,218	6.1%
JAMBI	2,591,000	2,873,758	2.6%
BENGKULU	1,477,000	1,621,474	2.4%
SOUTH SUMATRA	9,766,000	11,070,276	3.2%
LAMPUNG	5,797,000	6,644,128	3.5%
WEST JAVA	53,499,000	55,266,774	0.8%
INDONESIA	320,652,000	341,817,170	1.6%

Source: Statistical Yearbook Indonesia

(2.4.3) Environmental Impacts

There are no records available for environmental factors. The following countermeasures have been taken to mitigate possible negative environmental impacts according to the Dinas Bina Marga of South Sumatra and Lampung:

- Planting trees along the roadsides
- Slope protection such as sodding of the slopes along roadsides where cutting/banking work was implemented

(2.4.4) Relocation of Local Residents

Relocation/resettlement of local residents was not required because this project was limited to rehabilitation of existing road surfaces.

(2.4.5) Other Social Impacts

According to officials from provinces the mission has visited, project implementation has improved accessibility to the central city of each district significantly, providing better access for the residents of neighboring communities to various facilities, including hospitals, schools and large markets, and has raised the level of social welfare to a certain extent.

In the Betung – Sekayu project section in South Sumatra, a rubber factory was established near Sekayu after project completion, creating job opportunities in the surrounding area.

2.5 Sustainability

(2.5.1) Organization for maintenance

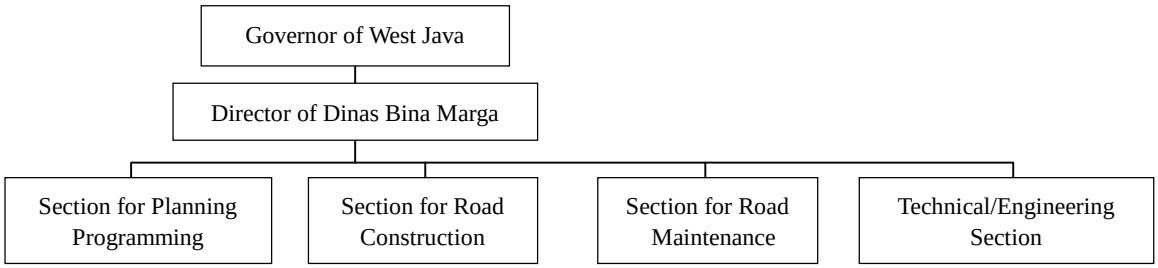
In November 2000, The Indonesian Cabinet prepared the PROPENAS (the national development program, 2000 – 2004), which identifies decentralization of authority as one of its

important policies.

In line with that policy, road development is currently under the responsibility of Directorate General of Regional Infrastructure, and Ministry of Settlements and Regional Infrastructure, at the central level. In accordance with the decentralization scheme, the P3JJ (Project of Planning & Supervision of Roads and Bridges) established under each provincial government has been placed in charge of road betterment and rehabilitation projects, replacing the RBO (Regional Betterment Office) under the Ministry of Public Works. With regard to road maintenance, the Dinas BINA MARGA (Public Works Department) of each provincial government is responsible for national and provincial roads.

The organizational structure of the public works department of West Java province is illustrated in Figure 1. Under the project manager of the road maintenance section, approximately 200 people are engaged in maintenance work. The central government is providing a training program for the technical staff. Approximately 100 people from West Java province participated in the training last year.

Figure 1: Organization of provincial Public Works Department in West Java



The information on all the project road sections has been managed as part of a database by the central government, using the IRMS (Integrated Road Management System) developed by the World Bank. The information includes road type, link number, length, width, average daily traffic volume, condition of the road surface and the roughness index. Every year, the central government has revised the data, which has been utilized for monitoring the condition of roads and for planning road rehabilitation. However, it is said that there is some inadequacy or inaccuracy in the updating work, because of the financial constraints at the provincial level, particularly in the years following the 1997 Asian Financial Crisis.

(2.5.2) Present Road Conditions

The survey mission visited the following project road sections in June/July of 2001.

a. Bandung – Sumedang (17 km) in West Java

The section is a part of the main national road directly connecting Bandung and Cirebon. Although many heavy vehicles use this road section, the road maintenance condition, in general, has not jeopardized the traffic safety. Some small holes can be found on the road surface, but they do not pose a significant problems. There is no notable damage or landslides on the road shoulders.

b. Betung – Sekayu (60 km) in South Sumatra

The road connects Lubuklinggau with Palembang, the provincial capital. Some holes, cracks on the carriageway and damage to the shoulders can be found in some short sections. The road width ranges from 5.5m to 6.0m, which is too narrow, and, consequently the tires of heavy vehicles are often forced out of the carriageway when two vehicles must pass in opposite directions. This causes damage to the carriageway as well as to the shoulders. The road is maintained by providing frequent patching or by spraying gravel into the holes.

c. Meramejat – Kayuagung (23 km) in South Sumatra

Until recently, this national road was a provincial road. Consequently, it is used mainly as a rural community road by small public buses and non-motorized vehicles, including bicycles and becak. The pavement has been stripped out in some sections, but the damage is not of grave concern because the road is used by few heavy vehicles.

d. Batas Cabdin – Martapura (80km) in South Sumatra

The road has been generally well maintained after the project. The road width of about 5m is too narrow for a national road. Since a new road (part of the East Coast Road) was constructed from Kayuagung toward Lanpung, most heavy vehicles have been diverted to the new road. Therefore, this road section is, at present, used mainly for the daily activities of the rural residents.

(2.5.3) Financial Status

Through the betterment and rehabilitation work, the project roads seem to have been improved in terms of their transport efficiency. However, there are some sections where additional rehabilitation and improvement are required. Although the Government of Indonesia has placed a high priority on the maintenance and rehabilitation of the existing infrastructure in recent years, actual maintenance work was not carried out to the extent necessary to slow the deterioration of the road conditions caused by rapidly growing traffic, particularly that of overloaded trucks. Road maintenance is usually carried out as part of the provincial budget, while for maintenance/rehabilitation projects, a special project fund is typically provided from the Central Government. The aforementioned IRMS selects maintenance/rehabilitation project roads. According to the Directorate General of Regional Infrastructure, financial constraints

constitute the main reason for inadequate maintenance. South Sumatra Province, for example, had a maintenance budget of Rp 1.5 million per km in 2000, which is only about 20% of the total required. It was not enough for the Dinas Bina Marga to afford sufficient construction materials and equipment. Even the routine maintenance work carried out by the province was insufficient to keep up with the damage on road sections with heavy traffic. Typically the road continues to deteriorate until the next rehabilitation project is implemented. The financial condition of the maintenance budget is similar for the other provinces.

The central government (Directorate General of Regional Infrastructure) is aware of this situation. In response, the following countermeasures are either being taken or are under consideration.

a. The heavily damaged sections are to be rehabilitated using loan projects
b. The annual vehicle tax will be increased to secure financial resources.
c. The vehicle weight checking system will be made more active and stricter.

The first measure is already being used for most of the trunk roads. The government also regards the second as appropriate, based on the principle that beneficiaries should bear the expenses for maintenance. The third one has some institutional problems: the budget for road maintenance is managed by the Directorate General of Regional Infrastructure, while vehicle weight is checked by the regional office of the DGLC (Directorate General of Land Communications). Accordingly, penalties collected for overweight heavy vehicles are not returned to the maintenance budget. This complication makes the checking system less functioning and sometimes susceptible to corruption, owing to the unfair/inaccurate weighing and charging system. In order to make the system work more effectively, renovation of the checking system will be required, including the institutional mechanism and an increase in the number of checking points.

Comparison of Original and Actual Scope

Item	Plan		Actual
(1) Project Scope			(The record in the executing agency does not distinguish rehabilitation and betterment.)
A. Works under the JBIC Project			
1.ACEH	<length>(km)	<Type of Treat>	
Beuneunun – Keumala	22.0	Betterment	46.0
Keumala – Geumpang	24.0	Betterment	
Lhok Seumawe – SP.KM 328	54.0	Rehabilitation	54.0
Langsa – BTS.Sumut	51.6	Rehabilitation	51.6
Tapak Tuan - BTS.Sumut	170.6	Betterment	125.0
Province Total	322.4		276.6
2.NORTH SUMATRA			
Lolowau – Teluk Dalam	55.0	Betterment	55.0
Province Total	55.0		55.0
3.WEST SUMATRA			
Panti – Simpang Empat	28.0	Betterment	
Simpang Empat – Sasak	22.4	Betterment	79.9
Simpang Empat - Air Bangis	27.0	Betterment	
Sicincin – Kurai – Taji	8.0	Rehabilitation	41.8
Kubukerambil – Solok	20.5	Rehabilitation	
Kubukerambil – Solok	9.7	Betterment	60.2
Kota Baru – TJ.Simalidu	12.0	Betterment	
Panti – BTS.Sumut	18.0	Rehabilitation	26.9
Province Total	145.6		208.8
4.RIAU			
Sikijang Mati – SP.Lago	47.57	Betterment	25.5
Province Total	47.57		25.5
5.JAMBI			
Siulak – BTS.Sumbar	29.0	Rehabilitation	33.4
Province Total	29.0		33.4
6.BENGKULU			
Aur Gading – Arga Makmur	10.0	Rehabilitation	37.0
Arga Makmur – Lais	44.0	Rehabilitation	
Curup – KM.127	42.4	Rehabilitation	87.4
KM.127 – Tanjung Sawah	45.0	Betterment	
Manna – Tanjung Bulan	39.9	Betterment	
Tanjung Bulan Buntuhan	46.1	Betterment	91.5
Buntuhan – BTS.Lampung	21.0	Rehabilitation	
Province Total	248.4		215.9

Item	Plan		Actual
7.SOUTH SUMATRA			
Palembang – Kayu Agung	62.34	Betterment	85.9
Meramjat – Kayu Agung	23.16	Betterment	
BTS.Cabdin – Rasuan	50.85	Betterment	48.0
Kurungan Nyawa – Martapura	8.00	Betterment	
SP.Kataway – SP.Sender	57.90	Betterment	
Muara Dua – SP.Campang	34.50	Betterment	
SP.Campang – Pulau Berangin	41.15	Betterment	145.0
SP.Lubuk Dalam – Bayur	12.75	Betterment	
Muara Dua – Simpang Haji	10.70	Betterment	
Betung – Sekayu	60.30	Rehabilitation	51.6
Sugih Waras – BTS.Cabdin	52.75	Betterment	86.8
BTS.Liot – BTS.Seksi Lahat	37.95	Betterment	
T.Tinggi – Tanjung Raya	39.00	Rehabilitation	39.0
Pangkal Pihang – Puding B	25.80	Rehabilitation	
Puding B – Puding Gebak	30.10	Rehabilitation	116.1
Puding Gebak – Kelapa	5.40	Rehabilitation	
P.Pinang – Sungai Liat	29.01	Rehabilitation	
Lumut – Tanjung Gugang	22.20	Rehabilitation	
Koba – Air Bara	8.45	Betterment	
Air Bara – Toboari	57.30	Rehabilitation	102.0
Pangkal Pinang – Katis	18.10	Rehabilitation	
Katis – Sungai Selor	16.50	Rehabilitation	
Province Total	704.21		674.4
8.LAMPUNG			
Ketapang – Gunung Labuan	46.00	Rehabilitation	44.8
Bandar Jaya – SP.Mataram	47.00	Betterment	83.5
Gunung Sugih – Padang Ratu	36.00	Betterment	
Gedung Dalam – Sukadana	15.60	Betterment	43.9
Metro – Kota Gajah	19.00	Betterment	
Jabung – Labuhan Maringgai	22.00	Betterment	
Gayam – Ketapang	14.00	Betterment	52.6
Blambangan - Palas	14.00	Betterment	
Pringsemu – Bandungbaru	13.00	Betterment	
Province Total	226.60		224.8
9.WEST JAVA			
Babagan – Cisolok	6.72	Rehabilitation	
Babagan – Cisolok	7.00	Rehabilitation	
Babagan – Cisolok	3.50	Rehabilitation	93.9
Babagan – Jampang Kulon	27.00	Betterment	
JP.Kulon – Ujung Genteng	14.02	Betterment	
Suka Negara – SD.Barang	67.23	Rehabilitation	64.2
Bandung – Cileunyi	12.40	Rehabilitation	17.0
Cileunyi – Sumedang	4.50	Rehabilitation	
Province Total	142.37		175.1
Grand Total	1,921.20		1,889.6
B. Consulting services for supervision of the above works	Foreign : 1,848 M/M Local : 8,991 M/M		Data on the consulting services not available from the executing agency.

Item	Plan	Actual
(2) Implementation Schedule		
Consulting Services	Aug. 1990 - Oct. 1992	Jan. 1991 - Nov. 1994
Civil works (Emergency)	Aug. 1990 - Oct. 1990	
Civil works (Major)	Nov. 1990 - Oct. 1992	
(3) Project Cost		
Foreign currency	14,174 million yen	12,984 million yen
Local currency	10,580 million yen	n.a.
Total	24,754 million yen	n.a.
ODA Loan Portion	21,040 million yen	20,087 million yen
(including local currency portion)		
Exchange Rate	1 rupiah = 0.073 yen	1 rupiah = 0.071 yen

Independent Evaluator's Opinion on Road Rehabilitation Project II

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1. This draft report is thorough, covering a range of important subjects as mentioned in the DAC evaluations.
2. Road rehabilitation and repair has very high relevance. Government budget constraints and the increasing importance of ensuring unimpeded flows of goods means that road maintenance and improved road capacity will play an increasingly vital role in the future.
3. As result of this project enable a higher number of vehicles to pass/use a particular stretch of road. Furthermore, significant reductions are achieved in time spent on the road. Accordingly, this project will have a positive effect on flows of goods and services and thus provide an effective contribution to economic development in various provinces.

The report states that the average EIRR of this project reached 34.5%, well above the determining criteria of 15.

4. Because the benefits of increased road use and time savings have not been quantified, it is very difficult to reach any conclusions on project efficiency. An appropriate solution would be to undertake comparisons with road repairs in other locations.
5. It is difficult to draw any conclusions about cause-effect relationship between road improvements and increased production, even though after road improvements less time spent on the road and there is a sharp increase in the number of vehicles using the road.
6. Given the current state of roads, with inadequate length and road-width, there will a sustained need for road repair and widening that must be met in coming years.

Because of the continued low availability of budget funds for road maintenance in Indonesia, funding from external sources remains an important need.