ICMA-SURE

1ST INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES FOR SUSTAINABLE RURAL DEVELOPMENT

MULTIDISCIPLINARY RESEARCH FOR RURAL INNOVATION

PURWOKERTO
14-15 NOVEMBER 2018

LEMBAGA PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT
UNIVERSITAS JENDERAL SOEDIRMAN

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Hotel Java Heritage Purwokerto, 14-15 November 2018
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Date: 25 September 2018

Letter of Acceptance

Dear Authors: Eko Bayu Purwasatriya (a*), Sugeng Sapto Surjono (b), D.Hendra Amijaya (b)

We are pleased to inform you that your abstract (ABS-38, Oral Presentation), entitled:

"New paradigm to understanding turbidite sediment in Banyumas Basin"

has been reviewed and accepted to be presented at ICMA-SURE 2018 conference to be held on 14-15 November 2018 in Purwokerto, Indonesia.

Please submit your full paper and make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Amin Fatoni, Ph.D
ICMA-SURE 2018 Chairperson

CERTIFICATE

1st ICMA-SURE 2018

1st International Conference on Multidisciplinary Approaches for Sustainable Rural Development

LPPM Unsoed, Java Heritage Hotel, Purwokerto, Central Java, INDONESIA
November,14-15, 2018

EKO BAYU PURWASATRIYA

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PARALLEL SESSION

DAY 1, NOVEMBER 14, 2018

PARALLEL SESSION 1 (13.15 – 15.15)

Group 1
Chair : Dr.Eng. Retno Supriyanti, ST, MT

1	DevOps Approach Embraces Forward and Reverse Engineering *Acep Taryana; Eko Murdyantoro; Ari Fadli; Siti Rahmah Nurshiami*
2	Designing Core Layer in Campus Network Using Software-Defined Networking *Iwan Setiawan, Azis Wisnu Widhi Nugraha, Sauqi, Asrorul Zaza*
3	Optimization of Photovoltaic DC Microgrid Systems for Residential Installations *Winasis (a*), Hari Prasetijo (b)*
4	FIBRE OPTIC AS EMBEDDED SENSORS TO FAILURE DETECTION OF BEAM GREEN CONCRETE *Farida Asriani (a), Gandjar Pamudji (b) HestiSusilawati (a), Dwi Meilana Tias Saputra (a)*
5	Leakage Current of Photovoltaic System in Transformerless Grid-Connected H-bridge Inverter with PI Current Controller *Suroso, Winasis, and Daru Tri Nugroho*
6	Stepper Motor Control with DRV 8825 Based on Square Wave Signal of The AVR Microcontroller Timer *Arief Wisnu Wardhana B.Eng (Hons)., M.Eng , Daru Tri Nugroho, S.T., M.T*
7	A Review of Lora Technology and Its Potential Use for Rural Development in Indonesia *Eko Murdyantoro, Azis Wisnu Widhi Nugraha, Arief Wisnu Wardhana, Ari Fadli, Mulki Indana Zulfa*
8	Classification Model for Graduation on Time Study Using Data Mining Techniques with SVM Algorithm *Ari Fadli, Mulki Indana Zulfa*, Yogi Ramadhani*
9	Intelligent Air Conditioner Ecosystem Based on Internet of Things Azis Wisnu Widhi Nugraha (a*), Acep Taryana(a), Bayu Eko Saputro(a), Prayogo Ismu Abdillah(a)
10	Potential for Availability of High Quality Paddy Seeds Supporting Rice Production / Productivity in West Java *Dian Firdaus (a*) and Ronnie Susman Natawidjaja (b)*

Group 2
Chair : Dr. Lutfi Makhasin

1	The Revitalization Model Through The Implementation Of Integrated Information System For Village Unit Cooperative In Banyumas Eko Suyono and Oman Rusmana
2	Village Official Website And Inclusive Communication Approach To Empowerment Of Marginal Villagers In Susukan Banyumas Central Java Nuryanti, Subejo, Roso Witjaksono, Mochammad Fathoni

3	Empowerment Of Karang Taruna As An Effort To Sustainability Of Rural Economic Growth In Madura Island RM. Moch. Wispandono
4	Model Of Inter Village Cooperation In Development Of Village Potentials To Support To Tourism In Baturraden District Kadar Pamuji, Riris Ardhanariswari, Abdul Aziz Ns, Supriyanto
5	The Role Of Stakeholders In The Accountability Of Village Enterprise Management: A Public Governance Approach Denok Kurniasih, Paulus Israwan Setyoko, M. Imron, Shadu S. Wijaya
7	Digital Marketing As A Catalyze Of Village-Owned Enterprise Revenue In Banyumas Agus Suroso, Amber Lumbantoruan, Mafudi, Ascaryan Rafinda
8	Fostering Trust As A Catalyst For The Sustainable Village Owned Enterprise Kiky Srirejeki, Agus Faturohman, Saras Supeno
9	Enhancing Group Entrepreneurial Quality Of Archaic Batik Design Agung Praptapa, Wiwiek Rabiatul Adawiyah, Istiqomah
10	Strategy To Develop Batik Tourism Village Istiqomah, Wiwiek Rabiatul Adawiyah, Agung Praptapa

Group 3
Chair : Dr. Haryadi

1	Factors Determining The Farmers Decision To Develop Their Beef Cattle Farming In The Southern Coastal Areas Of Central Java Mochamad Sugiarto, Syarifuddin Nur, and Oentoeng Edy Djatmiko
2	The Effect Of Dynamic Relationship Between Domestic Market And World Market On Stock Returns Volatility Najmudin, Dian Purnomo Jati, Sulistyandari, Retno Kurniasih
3	Bendi Traditional Transport Equipment As A Supporter Of Regional Economy Through Tourism And Culture Activities Elfrida Ratnawati Gultom
4	Behaviour Of Fishermens Implementing The Law In The Nature Conservation Rini Fidiyani, Erni Wulandari
5	Social And Legal Impact Of Different Determination Of Paddy Land Area In Indonesia Sri Wahyu Handayani
6	Co-Supply Chain As Local Entrepreneurial Support Model For Small Businesses: Is It Viable? Wiwiek Rabiatul Adawiyah, Istiqomah
7	The Impact Of Public Service Motivation On Individual Performance Adi Indrayanto, Ade Irma Anggraeni, Tiladela Luhita
8	Local Government Responsiveness In Preventing And Handling Divorce Phenomena (Study In Cilacap Regency) Dyah Retna Puspita, Rin Rostikawati , Pawrtha Dharma
9	Management Capacity Of Educational Office In The Provision Of Basic Education Services (Studi In Banyumas In Banyumas Regency) Muslih Faozanudin, Lilis Sri Sulistiani
10	Bridging The Legal Gap Between Open Selection And Internal Selection Of State Civil Apparatus Promotion In Indonesia Tedi Sudrajat, Siti Kunarti, Sri Hartini

Group 4
Chair : Dr. Norman Arie Prayoga

1	PHYSICAL STIMULATION FOR HYPERBILIRUBINEMIA Eni Rahmawati; Puji Lestari; Dian Susmarini; Agustina Desy P. B. Utami
2	ADOLESCENT DELINQUENCY Elsava Tamara Putri Murwanda, Wahyu Ekowati, Eni Rahmawati
3	Knowledge and Perception on Outdoor Spatial Spraying Againts Dengue : A Household Survey in Endemic Area, Central Java, Indonesia Siwi Pramatama Mars Wijayanti , Devi Octaviana, Arnika Dwi Asti
4	Consumer motivation to participate in the one day no rice policy Poppy Arsil , Kusmantoro Eddy Sularso, Altri Mulyani
5	Prevalence and Pedictors of Maternal Anemia during Pregnancy in Banyumas District Mekar Dwi Anggraeni, Amin Fatoni, Rahmi Setyani
6	Communication Challenges with Older Adults Patients during Clinical Learning: A Qualitative Study among Student Nurse Rahmi Setiyani, Made Sumarwati, Asep Iskandar, Ima Rismawati
7	Knowledge of Nutrition and Macronutrients Consumption as Factors Causing Wasting in School Children and Effective Nutrition Education to Improve It Dyah Umiyarni Purnamasari, Endo Dardjito
8	Mentzer Index Diagnostic Value in Predicting Thalassemia Diagnosis Wahyu Siswandari, Lantip Rujito, Vitasari Indriani, Wahyu Djatmiko
9	The Influence of the Combination of Listening to the Al Quran and Acupressure to the Physiological Response of Stresses of Hypertension Iwan Purnawan, Eman Sutrisna , Ikit Netra Wirakhmi
10	Organoleptic Characteristics of Bali Beef Meatballs Based on Collagen Concentration in UKKMB and Time of Maturation Effendi Abustam, Muhammad Irfan Said, and Muhammad Yusuf

Group 5
Chair : Dr.Amron

1	EFFECT OF IRON SUPPLEMENTATION TO ZINC SERUM Hesti Permata Sari, Ibnu Zaki, Farida, Afina Rachma Sulistyaning
2	Physicochemical Characteristics of Sweet Potato (Ipomoea batatas L.) Chips Pre-treated by Commercial and Eggshell Extracted Calcium Chloride David Tjandra, Thomas Indarto Putut Suseno, Ignasius Radix AP Jati
3	WELFARE AND HEMATOLOGIC CONDITION OF DUCKS UNDER INTENSIVE AND EXTENSIVE SYSTEMS OF PRODUCTION Imam Suswoyo and Rosidi
4	Family Roles on Supporting Patient with Terminal Illness : Lesson Learned from Banyumas Region Central Java Diyah Woro Dwi Lestari, Miko Ferine
5	Red Pitaya Pulp and Its Peel as a Lowering Agent of Blood Glucose Level for Patients with Diabetes Type 2 Sasi Gendro Sari, Siti Aminah, Susi, Rusmiati

6	DIGESTIBILITY IN VITRO OF STARCH AND PROTEIN ON ANALOG RICE BY FORMULATION OF NAGARA BEAN FLOUR MODIFIED L. plantarum AND SAGO STARCH WITH CONCENTRATION OF GLYCEROL MONOSTEARATE Susi Susi, Lya Agustina and Condro Wibowo
7	PRELIMINARY STUDY OF REHYDRATION CHARACTERISTICS AND COOKING TIME OF ANALOG RICE BY FORMULATION OF NAGARA BEAN FLOUR MODIFIED L. plantarum AND SAGO STARCH Susi Susi, Lya Agustina and Condro Wibowo
8	The Efficiency of Paddy Production Factors on Farm Land Consolidation In Sukoharjo Regency Titik Ekowati, Edy Prasetyo, Mukson
9	Low Frequency of electrical stimulation improve wound healing in acute wound Yunita sari, Atyanti Isworo, Arif Setyo Upoyo, Akhyarul Anam, Hartono, Eman Sutrisna
10	Effects of sucrose concentrations and scion sources on shoot tip grafting in vitro of Citrus aurantifolia Prita Sari Dewi, Fatichin, Octaviani Auditia, dan Aniq Sholihatul Lutfiyah

PARALLEL SESSION 2 (15.30 -17. 30)

Group 1
Chair : Dr.Eng. Suroso,ST, MT

1	ANALYSIS OF QUANTITATIVE RELATIONSHIPS OF ANIONIC SURFACTANT STRUCTURES OF SULFATE GROUP BASED ON LARGE AB INITIO CALCULATIONS *Eva Vaulina Y. D.*
2	THE EFFECT OF COMPACTION METHOD ON COMPRESSIVE STRENGTH OF SELF COMPACTING CONCRETE (SCC) IN LABORATORY *Agus Maryoto*
3	New paradigm to understanding turbidite sediment in Banyumas Basin *Eko Bayu Purwasatriya (a*), Sugeng Sapto Surjono (b), D.Hendra Amijaya (b)*
4	RESISTIVITY AND INDUCED POLARIZED (IP) APPROACH FOR POLYMETALLIC VEIN DISTRIBUTIONS OF BUKIT PONDOK MINERALIZATION (EX-VOC MINING IN 1902), TANAH TIDUNG, EAST KALIMANTAN *Fadlin(*a), Wildan Nur Hamzah (b), Eko Bayu Purwasatriya (c) Arifudin Idrus (d) Nita Ariyanti (e) Sekar Ramadhani (f)*
5	Ontology Model for Tourism Information in Banyumas *Lasmedi Afuan, Nurul Hidayat*
6	Measuring Usability Scale and Factors That Influence the Implementation of Internship Information System in Engineering Faculty of Jenderal Soedirman University *Swahesti Puspita Rahayu(*), Bangun Wijayanto(*), Dadang Iskandar(*)*
7	An Exploration Study : Spiritual belief, Spiritual need, and Spiritual care *Henie Kurniawati, Sofia Retnowati, Bagus Riyono, Widyawati*
8	Road Safety Audit at Black Spot Area (Case study in Tlahab Lor, Karangreja, Purbalingga) *Gito Sugiyanto (a*), Rizki Suciningtyas (a), Eva Wahyu Indriyati (a), Ari Fadli (b)*
9	Cattle feed concentrate automatization system based on internet of things *Bangun Wijayanto, S.T., M.Cs (*a), Swahesti Puspita Rahayu, S.Kom.,M.T. (b), Dadang Iskandar, S.T., M.Eng.(c)*

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New paradigm to understanding turbidite sediment in Banyumas Basin

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Abstract. Banyumas basin is one of sedimentary basin in Central Java. Based on surface geological mapping we can found many turbidite sediment in this area. Turbidite sediment is a sedimentary rocks with certain sedimentary structure such as graded bedding, paralel lamination, cross lamination or wavy lamination. Turbidite sediment formed by turbidity current which is caused by the existing of a slope. Several depositional environment which is have a slope can be a candidate as depositional environment of turbidite sediment in Banyumas Basin. Previous researcher always refer it to submarine fan depositional environment, because it is believed that Banyumas is a deep marine in the past time. But in the recent research, we found a buried volcanic arc in the middle of Banyumas Basin, that means there are several volcano formed at the middle of sea in the past time. Turbidity current cause by the slope of volcano's flank not the submarine slope. So the new paradigm to understanding the turbidite sediment in Banyumas Basin is Flysch and molasse turbidite sediment. Flysch is a turbidite sediment related to an orogenic process or the birth of a volcano, and molasse is a turbidite sediment related to reworked process of a volcano, such as weathering, erosion, transportation and then re-sedimentation

Keywords: Banyumas; Flysch; Molasse; Submarine fan; Turbidite

1. Introduction

Banyumas basin is one of sedimentary basin in southern Central Java which has many geological outcrop showing turbidite sediments. Turbidite sediment is a sedimentary rocks with certain sedimentary structure such as graded bedding, paralel lamination, cross lamination or wavy lamination. These sedimentary structure formed by turbidity current and caused by the existing of a slope. It is believed, that Banyumas Basin is a deep marine at the past time, so previous researcher and also its publication always assumed that the depositional environment of turbidite sediments in Banyumas Basin was a submarine fans. Based on the definition, submarine fans is a fan or cone-shaped submarine features that are accumulations of terrigenous sediment. They are also called abyssal cones, deep-sea cones, submarine deltas, etc. These fans are found offshore from most of the world's great rivers, and extend downward to abyssal depths. Periodic turbidity currents that flush sediments through submarine canyons are responsible for their buildup [1]. Some keywords from the definition are : abyssal, terrigenous sediment and submarine canyon. Submarine fan should be deposited on abyssal depth, the sediment materials are come from land (terrigenous) and it has submarine canyon to flush the sediments from land to deep sea.

Major outcrop of turbidite sediment in Banyumas Basin was from Halang Formation. Praptisih and Kamtono, 2011 studied Halang Formation in Ajibarang area and conclude that facies of the turbidite sediment are C and D from Walker and Mutti's models of mid fan submarine [2]. Setiawan, 2011 also studied turbidite sediment of Halang Formation in Cisanggarung river, Kuningan, and conclude that facies of turbidite sediment are lower fan and middle fan of a submarine fan system [3]. Widagdo, et al., 2015 found the geometry of a submarine fan in Gombong area and predict the source come from Gabon Formation and Kalipucang Formation [4]. Rizal, et al., 2016 study the Halang Formation in Cibalung area, Cilacap and conclude that turbidite sediment in these area divide into facies slope, inner fan, mid fan and outer fan of a submarine fan system [5]. Continued in 2017, Rizal et al., also studied Halang Formation in Pangkalan river, Banyumas and conclude that turbidite sediment in these area divide into five facies of submarine fan: proximal channel facies, distal leeves facies, frontal splay facies 1, crevasse splay facies and frontal splay facies 2 [6]. Almost all of previous researcher define the turbidite sediment in Banyumas Basin and surrounding area as a submarine fan system.

In recent years of author's research, found the buried volcanic arc in the middle of Banyumas Basin [7], that means there are several volcano formed at the middle of sea in the past time. The invention of volcanic arc in the middle of Banyumas Basin also change its paleogeography [8] and also the tectonostratigraphy [9]. So, turbidity current was caused by the slope of volcano's flank not the submarine slope and there is no submarine canyon that connecting from land to deep sea.

2. Data and Method

The data used in this research are primary data and secondary data. Primary data such as turbidite sedimentary structure from outcrop and some of petrological information from thin section. Secondary data was from literature study related to research's topic. The method used in this research is spotted regional geological mapping to find representative sample regarding turbidite sediment.

First data from outcrop regarding turbidite sediment is graded bedding structure (Figure 1). Graded bedding is a sedimentary structure usually on the bottom of a turbidite sequence. The coarser grain will settling to the bottom and the finer grain will remain in the top of bed made a grading pattern from coarse grain in the bottom to finer grain on the top. We can see in figure 1, white fragment in coarser part of the bedding is the tuff lapilli. Tuff lapilli has soft and brittle texture and will be dissapear with long distance sediment transportation. So, the occurence of tuff lapili as a fragment in the graded bedding indicating that turbidite sediment has near source. It will not suitable with term of submarine fan, while the sediment transported along submarine canyon from land to the deep sea.

Next data is a compact sandstone from turbidite sequence contain much of mollusca chip (Figure 2). White mollusca chip in the sandstone bed showing the shallow marine environment. It is also contradictory with term of submarine fan, while the depositional environment of submarine fan should be in the abyssal or deep marine. It is very rare that mollusca chip can reach abyssal environment, because the composition of mollusca chip is calcium carbonate that will be dissolve in abyssal depth (3000 – 6000 meters down). It will be an enigma if we used submarine fan term, but there are beds with much of mollusca chips.

Next data from outcrop is a bioturbation in the form of worm's trace (Figure 3). Worm cannot live in the deep sea; a worm's trace that had been fossilized in the claystone with parallel lamination structure indicating that turbidite sediment deposited in the transitional zone or shallow marine. It is also contradictory with submarine fan term, because submarine fan should be deposited in deep sea, whereas worms cannot live. Worm's trace is an ichnofossil and has strong evidence to indicate the depositional environment of a rocks.

Other data is from thin section that made from slice of sandstone to observe the petrology of the rocks under the microscope. Figure 4 showing thin section of lithic wacke and figure 5 is feldspathic wacke. Lithic wacke is a sandstone with more than 15% matrix and the fragment is dominated by lithic. In this case, lithic dominated by fragment of igneous rock, indicating the source could be from volcanic area. Important note from this thin section is absent or very minimum of quartz. Quartz is indicating terrigenous material because quartz is resistent mineral and still presence along far sediment

transportation. Figure 5 is another sample of thin section which is dominated by feldspar minerals. Feldspathic wacke is a sandstone with more than 15% matrix and the fragment is dominated by feldspar minerals. Left picture is parallel nicol and right picture is cross nicol; feldspar easier to identify in cross nicol mode, because its feature intercalated of dark and bright lamination. Feldspar indicating volcanic area source and the absent or minimum of quartz also confirm that submarine fan term is not suitable for this area.

3. Result and Discussion

The analysis will combine the data from the field and literature review from previous research. Several questions from data found in the field such as: how tuff lapilli can be a fragment in graded bedding?, how mollusca chip can accumulate in a sandstone bed of turbidite system? and how bioturbation in the form of worm's trace can be occur in the parallel lamination structure? should be answered, because it is contradictory to its tectonic setting that is deep marine.

Purwasatriya et al., 2017, had been delineate the volcanic arc in the middle of Banyumas Basin (Figure 6). Mio-Pliocene volcanic arc in the middle of basin had supply many volcanic sediments to the basin. The type of that volcano is sub-vulcano which is part of the body below the sea level and the other part of the body is above the sea level. This finding is a milestone and great discovery, because it can be answered all the questions and change the historical geology of the basin to date. The occurence of volcanic arc in Miocene to Pliocene describe how the tuff lapilli can be a fragment on graded bedding. The turbidite systems in Banyumas caused by the slope of volcano's flank, so the tuff lapilli doesn't need to trasported far away from its source and this is answered the first question. The arise of volcano arc also change some of depositional environments locally, so not all deep marine, but the rapid sedimentation of volcaniclastic material make the depositional environment along the arc become shallower. This describe answering the second question, why there is a lot of mollusca chip in a sandstone bed of turbidite system, because locally, along the volcanic arc, there are shallow marine environment where mollusca occur. This description also answering the third question, why bioturbation occur on the top of parallel laminated shale of a turbidite system, because locally along the arc also there are transition zone and land, when the volcano above the sea level.

After answering the questions from the field data, we know that it is not correct to use the term submarine fan to describe the turbidite sediment in Banyumas Basin. We need new paradigm to understanding turbidite sediment in Banyumas Basin, that is flysch and molasse. Flysch is a sedimentary deposit typically consisting of a thick sequence of interbedded marine shales and graywacke sandstones, which were deposited by turbidity currents and display graded bedding. Flysch is thought to be derived from the erosion of rapidly rising fold mountains and is itself deformed in the later stages of the orogeny. It is therefore a syntectonic deposit. The term was first defined in relation to Alpine rocks, but its use has been extended to other orogenic belts [1]. Molasse is an association of conglomerates and sandstones deposited as alluvial fans and lacustrine deposits. Rocks of the facies are associated with most mountain ranges and are post-tectonic deposits [1]. Based on the definition of flysch and molasse, at least there are two points to distinct flysch and molasse, first is rocks association and second is the time of its occurence (syn orogeny or post orogeny). Although in definition flysch called as syn-tectonic deposits and molasse called as post-tectonic deposits, but in my opinion it is better to related it to the orogeny than tectonic.

Flysch deposit found in the outcrop of Banyumas Basin (Figure 7), intercalating of marine shale and wacke sandstones. The sandstones has high morphology than marine shales, because its resistance to weathering and erosion, so the morphology of the sequences alternately high and low. Molasse deposits also can be found in the outcrop of Banyumas Basin (Figure 8), association of conglomerates or breccia and sandstones. The sandstones usually has coarser grain than sandstones in flysch deposits.

4. Conclusion

Conclusion of the research are as follow:

- The term of submarine fan is no more suitable to describe turbidite sediment in Banyumas Basin
- New paradigm to understanding turbidite sediment in Banyumas Basin are flysch and molasse deposits

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Figure 1. Graded bedding structure in Banyumas Basin with tuff lapilli fragments (white fragments)

Figure 2. A sandstone bedding from turbidite sequence contain much of mollusca chips (white chips)

Figure 3. Bioturbation in the form of worm's trace (red circle) indicating transitional environment

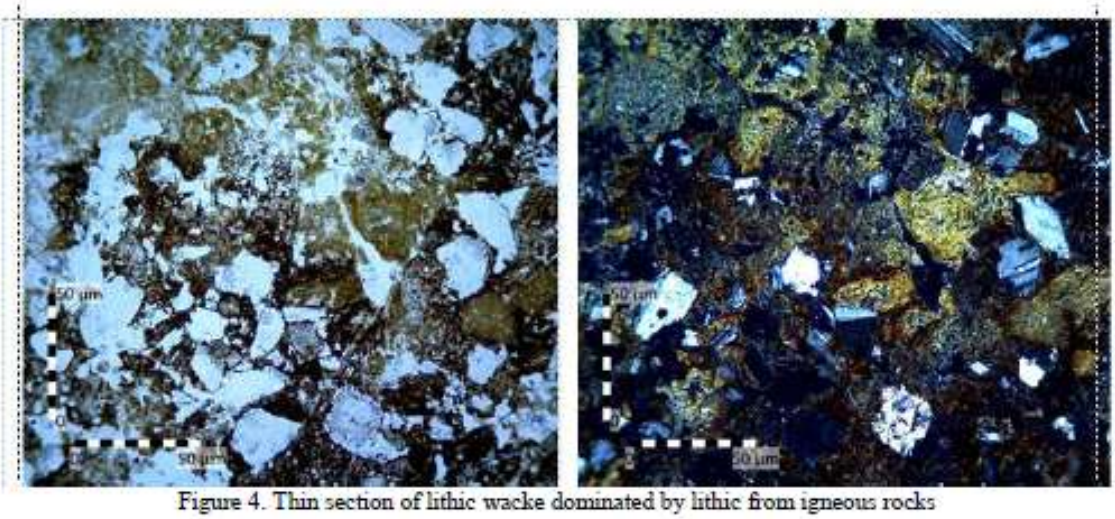

Figure 4. Thin section of lithic wacke dominated by lithic from igneous rocks

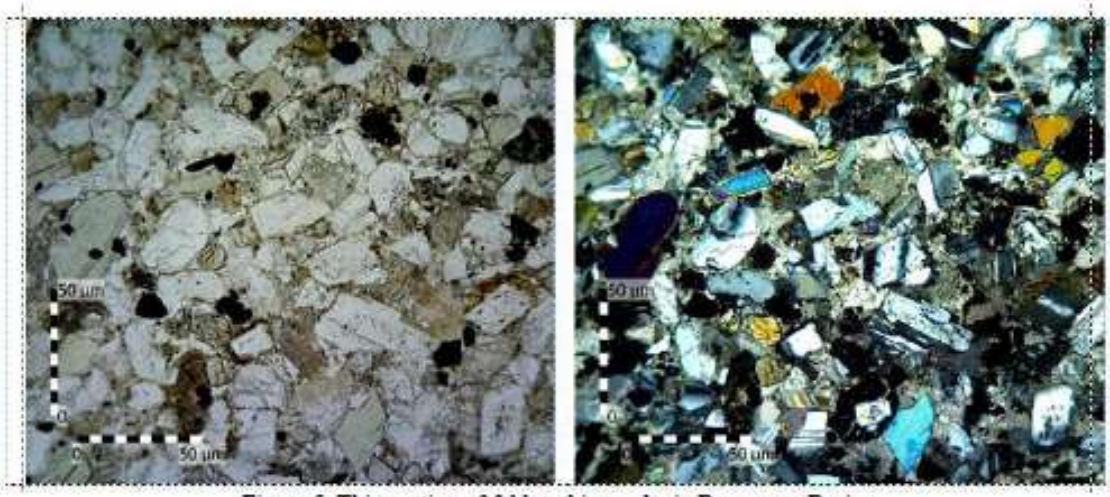

Figure 5. Thin section of feldspathic wacke in Banyumas Basin

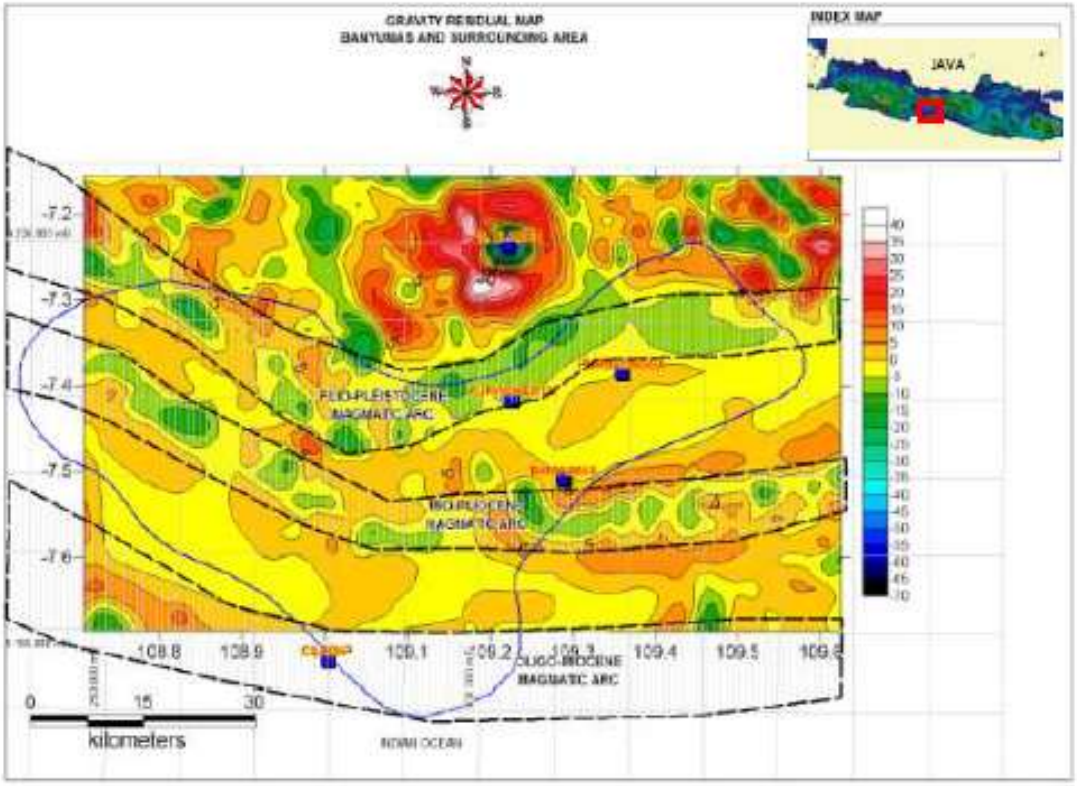

Figure 6. Delineation of magmatic/volcanic arc in Banyumas Basin (Purwasatriya et al., 2017)

Figure 7. Flysch deposit in Banyumas Basin, intercalating of marine shale and wacke sandstone

Figure 8. Association of conglomerates and coarse sandstone as molasse deposits in Banyumas Basin